

The Comparative Correlative construction
in World Englishes:
A Usage-based Construction Grammar approach

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Abstract

Employing a two-pronged approach to analyzing language, this study uses evidence obtained from a large-scale corpus study and psycholinguistic experiments to investigate the Comparative Correlative (CC) construction (e.g. *The more we get together, the happier we'll be*) across twenty varieties of English. More than 10,000 tokens from three of the largest corpora of English (COCA, BNC, GloWbE) and experimental data from almost 600 participants from four locations (Texas, South Africa, Singapore, and Kenya) are analyzed using advanced statistical methods, providing striking evidence for a high degree of parataxis between the subclauses of the construction and massive redundancy regarding cross-clausal associations which, it is argued, are best explained with a Usage-based Construction Grammar (CxG) approach that posits the existence of an elaborate network of interconnected meso-constructions. Addressing more general questions about the nature of human language, it is argued that this 'bottom-up' approach to language can account for one of the most fundamental riddles that the discipline of linguistics is striving to solve: Accounting for the potential of infinite creativity of language based on a finite set of rules. Furthermore, it is claimed that as an *inclusive* approach to language, CxG is better at accounting for construction-specific features that Mainstream Generative Grammar (MGG)-based approaches have struggled with. As it turns out, the evidence suggests that the English CC construction is anything but 'peripheral'.

Additionally, this study examines the CC construction from a World Englishes perspective, addressing a significant gap in research: Schneider, for example, has noted that “[o]nly rarely have New Englishes been employed as test cases for general questions of language theory” (2003: 237), and Hundt writes of the challenge of “bring[ing] intricate, quantitative modelling of usage data to bear on theoretical modelling” (2021: 298). Accordingly, this study provides evidence for the predictive power of Schneider’s Dynamic Model (DM) (2003, 2007), which posits that there is a correlation between evolutionary stages of World Englishes and linguistic features. In this context, it is also shown how principles of cognitive approaches to language can explain both generalizations across varieties as well as variety- and DM stage-specific effects. Furthermore, this study provides strong evidence to support Kortmann’s claim of a continuum ranging from Pidgins and Creoles as “deleters” to L1 varieties as “preservers” (2014: 9) of grammatical formatives, *contra* Mesthrie and Bhatt’s claim of a geographical dichotomy between African and Asian varieties.

Key terms: Comparative Correlative, Construction Grammar, meso-constructural network, cross-clausal associations, World Englishes, Dynamic Model

Contents

<i>Acknowledgments</i>	page v
<i>List of figures</i>	x
<i>List of tables</i>	xiv
<i>List of abbreviations</i>	xix
1 Introduction	1
1.1 The Comparative Correlative (CC)	4
1.2 Usage-based Construction Grammar and CCs	13
1.3 World Englishes and the Dynamic Model	20
1.4 Comparative Correlatives and the Dynamic Model	29
1.5 Objectives and outline	32
2 Data and methodology	35
2.1 Analyzing language with a Usage-based Construction Grammar approach	36
2.1.1 Corpora and corpus studies	37
2.1.1.1 HCFA	41
2.1.1.2 Covarying-collexeme analysis	43
2.1.1.3 LNRE models	48
2.1.2 Magnitude estimation experiments	49
2.1.2.1 Statistical analysis of MET data: Mixed-effects models	53
2.2 Analyzing language with a World Englishes approach	59
2.3 Corpus data	60
2.3.1 Corpora used	61
2.3.1.1 The British National Corpus	61
2.3.1.2 The Corpus of Contemporary American English	62
2.3.1.3 The Corpus of Global Web-based English	63
2.4 Software used	67
2.4.1 Data handling and coding: <i>Libre Office</i>	67
2.4.2 Data storage: <i>FAUbox</i>	67
2.4.3 Data analysis: <i>R</i> for Windows	68
3 Phenomena under inspection	69
3.1 Hypotactic features	70
3.1.1 <i>That</i> -complementizers	70
3.1.2 Subject-auxiliary inversion	74
3.1.3 Object pronoun extraction	75
3.2 Clause order	76
3.2.1 Non-iconic C2C1 order	76
3.2.2 Stacked CCs	80
3.3 Cross-clausal associations	83
3.3.1 Lexical fillers	84
3.3.2 Filler types	86
3.3.3 BE-deletion and truncation	88
3.3.4 Filler type and deletion/truncation interactions	90

3.4	Productivity of lexical filler slots	92
3.5	Prototypical fillers	93
3.6	Asymmetric encoding	94
4	Corpus study results	98
4.1	Hypotactic features	99
4.1.1	<i>That</i> -complementizers	99
4.1.1.1	<i>That</i> -complementizers in COCA	100
4.1.1.2	<i>That</i> -complementizers in BNC	102
4.1.1.3	<i>That</i> -complementizers in GloWbE	105
4.1.2	Subject-auxiliary inversion (SAI)	110
4.1.2.1	SAI in COCA	110
4.1.2.2	SAI in BNC	113
4.1.2.3	SAI in GloWbE	116
4.2	Clause order	122
4.2.1	Non-iconic C2C1 order	122
4.2.1.1	Non-iconic C2C1 order in COCA	123
4.2.1.2	Non-iconic C2C1 order in BNC	126
4.2.1.3	Non-iconic C2C1 order in GloWbE	127
4.2.2	Stacked CCs	131
4.2.2.1	Stacked CCs in COCA	132
4.2.2.2	Stacked CCs in BNC	134
4.2.2.3	Stacked CCs in GloWbE	134
4.3	Cross-clausal associations	137
4.3.1	Lexical fillers	138
4.3.1.1	Lexical Fillers in COCA and BNC	138
4.3.1.2	Lexical Fillers in GloWbE	139
4.3.2	Filler types	142
4.3.2.1	Filler types in COCA and BNC	143
4.3.2.2	Filler types in GloWbE	146
4.3.2.3	Filler type and lexical filler interactions	152
4.3.3	Deletion and truncation	157
4.3.3.1	Deletion and truncation in COCA and BNC	157
4.3.3.2	Deletion and truncation in GloWbE	160
4.3.4	Deletion/truncation and filler type interactions	173
4.3.5	Deletion/truncation, filler type and lexical filler interactions	180
4.4	Productivity of lexical filler slots	181
4.4.1	Filler pairs vs total amount of C1C2 tokens	181
4.4.2	LNRE models	187
4.5	Prototypical fillers	192
4.6	Summary	195
5	Introspective experiments results	199
5.1	<i>That</i> -complementizers	201
5.1.1	<i>That</i> -complementizers in American English	208
5.1.2	<i>That</i> -complementizers in South African English	211
5.1.2.1	<i>That</i> -complementizers in White South African English	213
5.1.2.2	<i>That</i> -complementizers in Coloured South African English	216
5.1.2.3	<i>That</i> -complementizers in Black South African English	217

5.1.3	<i>That</i> -complementizers in Singapore English	221
5.1.4	<i>That</i> -complementizers in Kenyan English	223
5.1.5	<i>That</i> -complementizers across varieties	226
5.2	Asymmetric encoding	235
5.2.1	Asymmetric encoding in American English	241
5.2.2	Asymmetric encoding in South African English	243
5.2.2.1	Asymmetric encoding in White South African English	243
5.2.2.2	Asymmetric encoding in Coloured South African English	245
5.2.2.3	Asymmetric encoding in Black South African English	247
5.2.3	Asymmetric encoding in Singapore English	250
5.2.4	Asymmetric encoding in Kenyan English	252
5.2.5	Asymmetric encoding across varieties	255
5.3	Object pronoun extraction	259
5.3.1	Object pronoun extraction in American English	264
5.3.2	Object pronoun extraction in South African English	267
5.3.2.1	Object pronoun extraction in White South African English	268
5.3.2.2	Object pronoun extraction in Coloured South African English	270
5.3.2.3	Object pronoun extraction in Black South African English	272
5.3.3	Object pronoun extraction in Singapore English	274
5.3.4	Object pronoun extraction in Kenyan English	276
5.3.5	5.3.2.1 Object pronoun extraction across varieties	278
5.4	Summary	279
6	A Usage-based Construction Grammar account of the English Comparative Correlative construction	283
6.1	Idiosyncrasies or construction-specific features?	284
6.2	From corpus data and experimental results to (meso-)constructions	289
6.3	The constructional network of the English CC construction	293
6.4	Putting the Dynamic Model to the test: The CC across World Englishes	311
7	Conclusion	325
	<i>Appendix</i>	328
	<i>References</i>	332

List of figures

Chapter 1

1.1 Illustration of a construction according to the CxG approach (Croft 2001: 18)	14
1.2 Visualization of a constructional network according to Langacker (2008: 226)	18
1.3 McArthur's wheel model (1987)	23
1.4 Kachru's Three Concentric Circles model (from Mesthrie 2008a: 30)	24
1.5 Extra-linguistic factors driving the evolution of Englishes (Buschfeld et al. 2014: 6)	27
1.6 The five stages of the DM, with four extra-linguistic factors at work in each stage (Buschfeld et al. 2014: 6)	28

Chapter 2

2.1 Uncoded tokens in the 10,000-token stratified random sample extracted from GloWbE, by variety	65
2.2 C1C2 tokens by GloWbE variety	66
2.3 C2C1 tokens by GloWbE variety	66

Chapter 3

3.1 DELETION and FILLER TYPE interactions illustrated as a network, based on COCA data (from Hoffmann et al. 2019: 32)	92
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Chapter 4

4.1 THAT-COMPLEMENTIZERS in COCA	101
4.2 C1 THAT-COMPLEMENTIZERS by COCA register	102
4.3 THAT-COMPLEMENTIZERS in BNC	103
4.4 C1 THAT-COMPLEMENTIZERS by BNC mode	104
4.5 Total number of THAT-COMPLEMENTIZER C1 tokens by GloWbE variety	107
4.6 Percentage of THAT-COMPLEMENTIZER C1 tokens by GloWbE variety	107
4.7 Percentage of THAT-COMPLEMENTIZER C2 tokens by GloWbE variety	108
4.8 Total number of THAT-COMPLEMENTIZER C2 tokens by GloWbE variety	108
4.9 THAT-COMPLEMENTIZER in C2 by DM stage, GloWbE	109
4.10 THAT-COMPLEMENTIZER in C1 by DM stage, GloWbE	109
4.11 SAI in C2, COCA	111
4.12 Realization of BE in C2, COCA, based on Hoffmann (2019: 127)	112
4.13 SAI in C2 by COCA register	113
4.14 SAI in C2, BNC	114
4.15 Realization of BE in C2, BNC	115
4.16 SAI in C2 by BNC mode	116
4.17 SAI in C2, GloWbE	117
4.18 Total number of SAI in C2 tokens by GloWbE variety	118
4.19 Percentage of SAI in C2 tokens by GloWbE variety	118
4.20 Realization of BE in C2, GLOWBE	119
4.21 SAI in C2 tokens by DM stage, GloWbE	120
4.22 Realization of main verb BE in C2 by DM stage, GloWbE	121
4.23 Realization of auxiliary BE in C2 by DM stage, GloWbE	121
4.24 C1C2 vs C2C1 tokens, COCA	124
4.25 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 and C2, COCA	125
4.26 LNRE model of C1C2 and C2C1 lexical filler productivity	125

(C1 and C2 combinations), COCA	
4.27 C1C2 vs C2C1 tokens, BNC	126
4.28 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 and C2, BNC	128
4.29 LNRE model of C1C2 and C2C1 lexical filler productivity (C1 and C2 combinations), BNC	129
4.30 C1C2:C2C1 token ratio by GloWbE variety	130
4.31 Total number of C2C1 tokens by GloWbE variety	130
4.32 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 across DM stages, GloWbE	131
4.33 LNRE model of C1C2 and C2C1 lexical filler productivity in C2 across DM stages, GloWbE	131
4.34 LNRE model of C1C2 and C2C1 lexical filler productivity (C1C2 combinations) across DM stages, GloWbE	132
4.35 Order types, COCA	134
4.36 Order types, BNC	134
4.37 Order types, GloWbE	136
4.38 Total number of stacked tokens by GloWbE variety	137
4.39 Order types across DM stages, GloWbE	137
4.40 Percentage of periphrastic vs. non-periphrastic lexical fillers in C2, GloWbE	145
4.41 Percentage of periphrastic vs. non-periphrastic lexical fillers in C1, GloWbE	145
4.42 FILLER TYPE association across C1 and C2, BNC (based on Hoffmann et al. 2020: 206)	146
4.43 FILLER TYPE association across C1 and C2, COCA (based on Hoffmann et al. 2019: 13)	146
4.44 FILLER TYPE association across C1 and C2, GloWbE	148
4.45 C1 FILLER TYPE tokens by GloWbE variety	149
4.46 C1 FILLER TYPE tokens by GloWbE variety, percentages	149
4.47 C2 FILLER TYPE tokens by GloWbE variety	150
4.48 C2 FILLER TYPE tokens by GloWbE variety, percentages	150
4.49 DELETION association across C1 and C2, BNC (based on Hoffmann et al. 2020: 208)	159
4.50 DELETION association across C1 and C2, COCA (based on Hoffmann et al. 2019: 18)	159
4.51 DELETION across C1 and C2, GloWbE	162
4.52 C1 DELETION tokens by GloWbE variety, percentages	163
4.53 C1 DELETION tokens by GloWbE variety	163
4.54 C2 DELETION tokens by GloWbE variety, percentages	164
4.55 C2 DELETION tokens by GloWbE variety	164
4.56 LNRE model of C1 Lexical filler productivity, DM stages in GloWbE	189
4.57 LNRE model of C2 Lexical filler productivity, DM stages in GloWbE	189
4.58 LNRE model of C1 and C2 Lexical filler productivity, DM stages in GloWbE	190
4.59 LNRE model of C1xC2 Lexical filler combination productivity, DM stages in GloWbE	191
4.60 LNRE model of V slot productivity in Brunner and Hoffmann's study on the <i>way</i> -construction (2020: 15)	191
4.61 Relative frequency of C1C2 per million word by variety, GloWbE	194
Chapter 5	
5.1 Z-score ratings of test item lexicalizations grouped by factor combinations, all varieties (<i>that</i> -complementizer experiment)	206
5.2 Z-score ratings of material sets grouped by factor combinations, all varieties (<i>that</i> -complementizer experiment)	206
5.3 Z-scores of fillers (<i>that</i> -complementizer experiment), AmE (n=38)	209
5.4 Z-scores of THAT vs. NO THAT (∅) in C1:C2 (<i>that</i> -complementizer experiment), AmE (n=38)	210
5.5 Z-scores of fillers (<i>that</i> -complementizer experiment), White SAfE (n=18)	214
5.6 Z-scores of THAT vs. NO THAT (∅) in C1:C2 (<i>that</i> -complementizer experiment), White SAfE (n=18)	215
5.7 Z-scores of fillers (<i>that</i> -complementizer experiment), CSAfE (n=49)	216

5.8 Z-scores of THAT vs. NO THAT (\emptyset) in C1:C2 (<i>that</i> -complementizer experiment), CSAfE (n=49)	217
5.9 Z-scores of fillers (<i>that</i> -complementizer experiment), BSAfE (n=18)	218
5.10 Z-scores of THAT vs. NO THAT (\emptyset) in C1:C2 (<i>that</i> -complementizer experiment), BSAfE (n=18)	219
5.11 Z-scores of THAT vs. NO THAT interactions across C1 and C2, South African varieties (<i>that</i> -complementizer experiment)	221
5.12 Z-scores of fillers (<i>that</i> -complementizer experiment), Singapore (n=31)	222
5.13 Z-scores of THAT vs. NO THAT (\emptyset) in C1:C2 (<i>that</i> -complementizer experiment), Singapore (n=31)	223
5.14 Z-scores of fillers (<i>that</i> -complementizer experiment), Kenya (n=38)	224
5.15 Z-scores of THAT vs. NO THAT (\emptyset) in C1:C2 (<i>that</i> -complementizer experiment), Kenya (n=38)	225
5.16 Scatter plot of THAT in C1 z-score ratings across varieties	227
5.17 Scatter plot of NO THAT (\emptyset) in C1 z-score ratings across varieties	227
5.18 Magnitude estimation z-scores of THAT in C1 subtracted from z-score ratings of NO THAT in C1 across varieties	228
5.19 Scatter plot of NO THAT-NO THAT (\emptyset - \emptyset) z-score ratings across varieties	229
5.20 Scatter plot of THAT-NO THAT (<i>that</i> - \emptyset) z-score ratings across varieties	230
5.21 Scatter plot of NO THAT-NO THAT (\emptyset - \emptyset) (red) and THAT-NO THAT (<i>that</i> - \emptyset) (blue) z-score ratings across varieties	230
5.22 Magnitude estimation z-scores of NO THAT-NO THAT (\emptyset - \emptyset) and THAT-NO THAT (<i>that</i> - \emptyset) z-score ratings across varieties	231
5.23 Scatter plot of THAT-THAT (<i>that</i> - <i>that</i>) z-score ratings across varieties	232
5.24 Scatter plot of NO THAT-THAT (\emptyset - <i>that</i>) z-score ratings across varieties	232
5.25 Scatter plot of NO THAT-NO THAT (\emptyset - \emptyset) (red) and THAT-THAT (blue) z-score ratings across varieties	233
5.26 Magnitude estimation z-scores of NO THAT-NO THAT (\emptyset - \emptyset), THAT-NO THAT (<i>that</i> - \emptyset), NO THAT-THAT (\emptyset - <i>that</i>) and THAT-THAT (<i>that</i> - <i>that</i>) across varieties	234
5.27 Z-score ratings of item lexicalizations grouped by factor combinations, all varieties (asymmetric encoding experiment)	239
5.28 Z-score ratings of material sets grouped by factor combinations, all varieties (asymmetric encoding experiment)	239
5.29 Z-scores of fillers (asymmetric encoding experiment), AmE (n=42)	241
5.30 Z-scores of AS in C1 vs. THEN in C2, AmE (n=42)	242
5.31 Z-scores of fillers (asymmetric encoding experiment), WSAfE (n=6)	244
5.32 Z-scores of AS in C1 vs. THEN in C2, WSAfE (n=6)	245
5.33 Z-scores of fillers (asymmetric encoding experiment), CSAfE (n=49)	246
5.34 Z-scores of AS in C1 vs. THEN in C2, CSAfE (n=49)	247
5.35 Z-scores of fillers (asymmetric encoding experiment), BSAfE (n=27)	248
5.36 Z-scores of AS in C1 vs. THEN in C2, BSAfE (n=28)	249
5.37 Z-scores of AS C1:THEN C2 interactions, South African varieties (asymmetric encoding experiment)	250
5.38 Z-scores of fillers (asymmetric encoding experiment), SingE (n=32)	251
5.39 Z-scores of AS in C1 vs. THEN in C2, SingE (n=32)	252
5.40 Z-scores of fillers (asymmetric encoding experiment), KenE (n=39)	253
5.41 Z-scores of AS in C1 vs. THEN in C2, KenE (n=39)	254
5.42 Magnitude estimation z-scores of NO AS-NO THEN (\emptyset - \emptyset), AS-NO THEN (<i>as</i> - \emptyset), NO AS-THEN (\emptyset - <i>then</i>) and AS-THEN (<i>as</i> - <i>then</i>) across varieties (without WSAfE)	256

5.43 Scatter plot of z-score ratings of the combination NO AS-NO THEN (\emptyset - \emptyset) across varieties	257
5.44 Scatter plot of z-score ratings of the combination NO AS-THEN (\emptyset -then) across varieties	257
5.45 Scatter plot of z-score ratings of the combination AS-THEN (as-then) across varieties	258
5.46 Scatter plot of z-score ratings of the combination AS-NO THEN (as- \emptyset) across varieties	258
5.47 Magnitude estimation z-scores of THEN in C2 subtracted from z-score ratings of NO THEN in C2 across varieties	259
5.48 Z-score ratings of item lexicalizations grouped by factor combinations, all varieties (object pronoun extraction experiment)	265
5.49 Z-score ratings of material sets grouped by factor combinations, all varieties (object pronoun extraction experiment)	265
5.50 Z-scores of fillers (object pronoun extraction experiment), AmE (n=37)	266
5.51 Z-scores of OBJ in C1 vs. OBJ in C2, AmE (n=37)	267
5.52 Z-scores of fillers (object pronoun extraction experiment), WSAfE (n=15)	268
5.53 Z-scores of OBJ in C1 vs. OBJ in C2, WSAfE (n=15)	269
5.54 Z-scores of fillers (object pronoun extraction experiment), CSAfE (n=53)	270
5.55 Z-scores of OBJ in C1 vs. OBJ in C2, CSAfE (n=53)	271
5.56 Z-scores of fillers (object pronoun extraction experiment), BSAfE (n=34)	273
5.57 Z-scores of OBJ in C1 vs. OBJ in C2, BSAfE (n=34)	273
5.58 Z-scores of fillers (object pronoun extraction experiment), SingE (n=33)	274
5.59 Z-scores of OBJ in C1 vs. OBJ in C2, SingE (n=33)	275
5.60 Z-scores of fillers (object pronoun extraction experiment), KenE (n=40)	276
5.61 Z-scores of OBJ in C1 vs. OBJ in C2, KenE (n=40)	277
5.62 Magnitude estimation z-scores of NO OBJ -NO OBJ (\emptyset - \emptyset), OBJ-OBJ (obj-obj), NO OBJ-OBJ (\emptyset -obj) abd OBJ-NO OBJ (obj- \emptyset) across varieties, object extraction experiment	278
5.63 Scatter plot of OBJ-OBJ z-score ratings across varieties	280
5.64 Scatter plot of NO OBJ-OBJ (\emptyset -OBJ) z-score ratings across varieties	280
5.65 Scatter plot of NO OBJ-NO OBJ (\emptyset - \emptyset) z-score ratings across varieties	281
5.66 Scatter plot of OBJ-NO OBJ (OBJ- \emptyset) z-score ratings across varieties	281
 Chapter 6	
6.1 Detail of a 17th-century map of the Americas (Frederik de Wit, 1660)	288
6.2 Modern map of North America, approximately showing the same area as in 6.1 (United States Central Intelligence Agency 2001)	288
6.3 Example of a multiple-inheritance network	292
6.4 Basic CC network	296
6.5 AmE and BrE CC network (based on data from COCA, BNC, and GloWbE)	302
6.6 Multiple inheritance network showing the meso-constructions behind 'The more you give, the more you get.'	307
6.7 DM Stage V CC network (based on data from GloWbE)	314
6.8 DM Stage IV CC network (based on data from GloWbE)	315
6.9 DM Stage III CC network (based on data from GloWbE)	316
6.10 DM Stage II CC network (based on data from GloWbE)	317
6.11 Magnitude estimation z-scores of THAT in C1 subtracted from z-score ratings of NO THAT in C1 across varieties	318
6.12 Dominant Home Language of Chinese Primary-1 Students (Singapore Ministry of Education 2010)	319
6.13 Magnitude estimation z-scores of THEN in C2 subtracted from z-score ratings of NO THEN in C2 across varieties	321

List of tables

Chapter 1

1.1 Overview of CCs in various languages	6
1.2 Examples of constructions along the lexicon-syntax continuum	15
1.3 Examples of terminology used in the present study	22
1.4 Investigated varieties, classified according to the Dynamic Model	29

Chapter 2

2.1 Google scholar search results for BNC, COCA, and GloWbE	40
2.2 Example of a HCFA results table: Two-way associations between verb lemma and variety (adapted from Brunner and Hoffmann 2020: 16)	43
2.3 2-by-2 distribution as used in covarying-collexeme analysis (cf. Stefanowitsch and Gries 2005: 9; Hoffmann 2011: 23)	44
2.4 Example of output from a covarying-collexeme analysis of lexical fillers in C1 and C2 in Slovak using the Coll.analysis 3.2a script (adapted from Horsch 2021: 212)	47
2.5 Syntactic variables investigated in the MET experiments	56
2.6 Classification of GloWbE varieties according to DM stages (based on Hoffmann and Brunner 2020: 3), with codes and word counts (based on Davies and Fuchs 2015: 6)	64

Chapter 4

4.1 Coding of the variable THAT-COMPLEMENTIZER	100
4.2 THAT-COMPLEMENTIZERS in C1 and C2, COCA	101
4.3 Covarying-collexeme analysis of <i>that</i> -complementizers across C1 and C2 in COCA, from Hoffmann (2019: 125)	101
4.4 Distribution of C1 THAT-COMPLEMENTIZER tokens by COCA register	102
4.5 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS across COCA registers (expected frequency ≥ 5)	102
4.6 THAT-COMPLEMENTIZERS in C1 and C2, BNC (Hoffmann et al. 2020: 205)	103
4.7 Covarying-collexeme analysis of <i>that</i> -complementizers across C1 and C2 in BNC	104
4.8 C1 THAT-COMPLEMENTIZERS by BNC mode	104
4.9 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS across BNC modes (expected frequency ≥ 5)	104
4.10 THAT-COMPLEMENTIZERS in C1 and C2, GloWbE (all varieties)	105
4.11 Covarying-collexeme analysis of THAT-COMPLEMENTIZERS across C1 and C2 in GloWbE	105
4.12 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS and DM stage	106
4.13 THAT-COMPLEMENTIZER C1 tokens by GloWbE variety, grouped according to DM stage	107
4.14 THAT-COMPLEMENTIZER C2 tokens by GloWbE variety, grouped according to DM stage	108
4.15 THAT-COMPLEMENTIZER C1 and C2 tokens by DM stage, GloWbE	109
4.16 Coding of the variable SUBJECT-AUXILIARY INVERSION C2	110
4.17 SAI in C2, COCA	111
4.18 Realization of BE in C2, COCA	112
4.19 Covarying-collexeme analysis of BE-Realization in C2, COCA, from Hoffmann (2019: 127)	112
4.20 Distribution of SAI in C2 across COCA registers	113
4.21 Covarying-collexeme analysis of SAI in C2 across COCA registers (expected frequency ≥ 5)	113
4.22 SAI in C2, BNC	114

4.23	Realization of BE in C2, BNC	115
4.24	Covarying-collexeme analysis of BE-Realization in C2, BNC	115
4.25	SAI in C2 by BNC mode	116
4.26	Covarying-collexeme analysis of SAI in C2 across BNC modes (expected frequency ≥ 5)	116
4.27	SAI in C2, GloWbE	117
4.28	SAI in C2 tokens by GloWbE variety, grouped according to DM stage	118
4.29	Realization of BE in C2, GloWbE	119
4.30	SAI in C2 tokens by DM stage, GloWbE	120
4.31	Covarying-collexeme analysis of SAI in C2, GloWbE	120
4.32	Realization of main verb BE in C2 by DM stage, GloWbE	121
4.33	Realization of auxiliary BE in C2 by DM stage, GloWbE	121
4.34	HCFA of BE realization in C2, GloWbE (observed frequency ≥ 5 , $Q \geq 0.002$)	122
4.35	Coding of the variable ORDER	122
4.36	Coding of the variable THE IN C2	123
4.37	C1C2 and C2C1 tokens, COCA	124
4.38	THE in C2 tokens, COCA	124
4.39	C1C2 and C2C1 tokens, BNC	126
4.40	THE in C2 tokens, BNC	126
4.41	C1C2 and C2C1 tokens across DM stages	127
4.42	C1C2 and C2C1 tokens by GloWbE variety, grouped according to DM stage	129
4.43	Grouping and coding of stacked CCs	132
4.44	Order types, COCA	133
4.45	Order types, BNC	133
4.46	Order types, GloWbE	135
4.47	C1C2 and C2C1 tokens across DM stages	135
4.48	C1C2 and stacked CC tokens by GloWbE variety, grouped according to DM stage	136
4.49	Covarying-collexeme analysis of DM stage and order types, GloWbE	137
4.50	Coding of variables that were investigated regarding cross-clausal associations	137
4.51	Covarying-collexeme analysis of LEXICAL FILLER in C1 and C2, COCA (from Hoffmann et al. 2019: 15) (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	138
4.52	Covarying-collexeme analysis of LEXICAL FILLER in C1 and C2, BNC (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	139
4.53	Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE-GB (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	140
4.54	Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage V (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	140
4.55	Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage IV (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	140
4.56	Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage III (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	140
4.57	Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage II (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)	141
4.58	Coding of variable PERIPHRASTIC FORM in C1 and C2	141
4.59	Covarying-collexeme analysis of FILLER TYPE across C1 and C2, COCA (adapted from Hoffmann et al. 2019: 14) (expected frequency ≥ 5 , only significant results)	143
4.60	Frequency of periphrastic vs. non-periphrastic lexical fillers in C1, GloWbE	144
4.61	Frequency of periphrastic vs. non-periphrastic lexical fillers in C2, GloWbE	144
4.62	FILLER TYPE frequencies in C1 and C2, COCA (from Hoffmann et al. 2019: 14)	145
4.63	FILLER TYPE frequencies in C1 and C2, BNC (from Hoffmann et al. 2020: 206)	145

4.64 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, BNC (adapted from Hoffmann et al. 2020: 207) (expected frequency ≥ 5 , only significant results)	146
4.65 FILLER TYPE frequencies in C1 and C2, GloWbE	147
4.66 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE-GB (expected frequency ≥ 5)	147
4.67 C1 FILLER TYPE tokens by GloWbE variety, grouped according to DM stage	148
4.68 C2 FILLER TYPE tokens by GloWbE variety, grouped according to DM stage	149
4.69 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage V (expected frequency ≥ 5)	150
4.70 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage IV (expected frequency ≥ 5)	150
4.71 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage III (expected frequency ≥ 5)	151
4.72 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage II (expected frequency ≥ 5)	151
4.73 HCFA of FILLER TYPEs, GloWbE (expected frequency ≥ 5 , only significant results)	152
4.74 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 17) (expected frequency ≥ 5 , only attraction)	154
4.75 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, BNC (expected frequency ≥ 5 , only significant attraction)	154
4.76 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, GloWbE-GB (expected frequency ≥ 5 , only significant attraction)	155
4.77 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, GloWbE stage V (expected frequency ≥ 5 , only significant attraction)	155
4.78 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, GLOWBE stage IV (expected frequency ≥ 5 , only significant attraction)	155
4.79 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, GloWbE stage III (expected frequency ≥ 5 , only significant attraction)	156
4.80 Covarying-collexeme analysis of LEXICAL FILLER \times FILLER TYPE interactions across C1 and C2, GLOWBE stage II (expected frequency ≥ 5 , only significant attraction)	156
4.81 DELETION frequencies in C1 and C2, COCA (Hoffmann et al. 2019)	158
4.82 DELETION frequencies in C1 and C2, BNC (Hoffmann et al. 2020)	158
4.83 Covarying-collexeme analysis of DELETION across C1 and C2, COCA (based on Hoffmann et al. 2019: 14) (expected frequency ≥ 5)	159
4.84 Covarying-collexeme analysis of DELETION across C1 and C2, BNC (based on Hoffmann et al. 2019: 14) (expected frequency ≥ 5)	159
4.85 DELETION frequencies in C1 and C2, GloWbE	161
4.86 C1 DELETION tokens by GloWbE variety, grouped according to DM stage	162
4.87 C2 DELETION tokens by GloWbE variety, grouped according to DM stage	163
4.88 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE-GB (expected frequency ≥ 5)	164
4.89 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage V (expected frequency ≥ 5)	165
4.90 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage IV (expected frequency ≥ 5)	166
4.91 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage III (expected frequency ≥ 5)	166
4.92 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage II	167

(expected frequency ≥ 5)	
4.93 All significant DELETION patterns and in which corpora they were found, with collostructional strength values	169
4.94 HCFA of DELETION, GloWbE (expected frequency ≥ 5 , only significant results)	171
4.95 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 23) (expected frequency ≥ 5 , only significant attraction)	174
4.96 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, BNC (from Hoffmann et al. 2020: 211) (expected frequency ≥ 5 , only significant attraction)	175
4.97 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, GloWbE-GB (expected frequency ≥ 5 , only significant attraction)	176
4.98 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, GloWbE stage V (expected frequency ≥ 5 , only significant attraction)	177
4.99 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, GloWbE stage IV (expected frequency ≥ 5 , only significant attraction)	177
4.100 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, GloWbE stage III (expected frequency ≥ 5 , only significant attraction)	178
4.101 Covarying-collexeme analysis of DELETION \times FILLER TYPE interactions across C1 and C2, GloWbE stage II (expected frequency ≥ 5 , only significant attraction)	178
4.102 All significant DELETION \times FILLER TYPE combinations, and in which corpora they were found	179
4.103 Comparison of unidirectional cue validities (ΔP values) for the combination Full clause_AdvP_more \times Full clause_AdvP_more across all corpora	180
4.104 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 25) (expected frequency ≥ 5 , only significant attraction)	182
4.105 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, BNC (expected frequency ≥ 5 , only significant attraction)	182
4.106 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, GloWbE-GB (expected frequency ≥ 5 , only significant attraction)	182
4.107 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, GloWbE stage V (expected frequency ≥ 5 , only significant attraction)	183
4.108 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, GloWbE stage IV (expected frequency ≥ 5 , only significant attraction)	183
4.109 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, GloWbE stage III (expected frequency ≥ 5 , only significant attraction)	183
4.110 Covarying-collexeme analysis of DELETION \times FILLER TYPE \times LEXICAL FILLER interactions across C1 and C2, GloWbE stage II (expected frequency ≥ 5 , only significant attraction)	183
4.111 Filler pairs vs. C1C2 token ratio across DM stages, GloWbE	184
4.112 Significantly associated LEXICAL FILLER pairs in GloWbE Great Britain	184
4.113 Significantly associated LEXICAL FILLER pairs in GloWbE Canada	184
4.114 Significantly associated LEXICAL FILLER pairs in GloWbE Ireland	185
4.115 Significantly associated LEXICAL FILLER pairs in GloWbE Australia	185

4.116 Significantly associated LEXICAL FILLER pairs in GloWbE New Zealand	185
4.117 Significantly associated LEXICAL FILLER pairs in GloWbE Singapore	185
4.118 Significantly associated LEXICAL FILLER pairs in GloWbE South Africa	185
4.119 Significantly associated LEXICAL FILLER pairs in GloWbE Jamaica	185
4.120 Significantly associated LEXICAL FILLER pairs in GloWbE Philippines	185
4.121 Significantly associated LEXICAL FILLER pairs in GloWbE Malaysia	186
4.122 Significantly associated LEXICAL FILLER pairs in GloWbE India	186
4.123 Significantly associated LEXICAL FILLER pairs in GloWbE Kenya	186
4.124 Significantly associated LEXICAL FILLER pairs in GloWbE Tanzania	186
4.125 Significantly associated LEXICAL FILLER pairs in GloWbE Nigeria	186
4.126 Significantly associated LEXICAL FILLER pairs in GloWbE Hong Kong	186
4.127 Significantly associated LEXICAL FILLER pairs in GloWbE Sri Lanka	186
4.128 Significantly associated LEXICAL FILLER pairs in GloWbE Ghana	186
4.129 Significantly associated LEXICAL FILLER pairs in GloWbE Bangladesh	187
4.130 Significantly associated LEXICAL FILLER pairs in GloWbE Pakistan	187
4.131 Filler pair and hapax counts across COCA, BNC, and GloWbE	191
4.132 Relative frequency ($\Sigma C1C2 / \Sigma \text{Corpus size}$) of C1C2 per million word by DM stage, GloWbE	192
4.133 Relative frequency ($\Sigma C1C2 / \Sigma \text{Corpus size}$) of C1C2 per million words by variety, GloWbE	193
4.134 HCFA of DELETION, GloWbE (only significant results)	194

Chapter 5

5.1 Significant and non-significant predictors for each experiment, determined by means of stepwise regression	201
5.2 Number of material sets (MS) filled out in each variety, with DM stage in brackets (<i>that</i> -complementizer experiment)	205
5.3 Likelihood ratio tests for random effects, and their order of elimination (<i>that</i> -complementizer experiment)	207
5.4 F-tests for the fixed effects, and their order of elimination (<i>that</i> -complementizer experiment)	207
5.5 Number of material sets (MS) filled out in each variety, with DM stage in brackets (asymmetric encoding experiment)	238
5.6 Likelihood ratio tests for random effects, and their order of elimination (asymmetric encoding experiment)	238
5.7 F-tests for the fixed effects, and their order of elimination (asymmetric encoding experiment)	240
5.8 Number of material sets (MS) filled out in each variety, with DM stage in brackets (object pronoun extraction experiment)	262
5.9 Likelihood ratio tests for random effects, and their order of elimination (object pronoun extraction experiment)	263
5.10 F-tests for the fixed effects, and their order of elimination (object pronoun extraction experiment)	264
5.11 Differences in z-score means between ungrammatical and grammatical fillers across experiments and varieties	282

List of abbreviations

AdjP	Adjective phrase
AdvP	Adverb phrase
AmE	American English
ATB	across-the-board extraction
AuE	Australian English
BangE	Bangladeshi English
BNC	British National Corpus
BrE	British English
BROWN	Brown Corpus of American English
BSAfE	Black South African English
C1	Independent/protasis clause
C1C2	Iconic C1→C2 clause order
C2	Dependent/apodosis clause
C2C1	Non-iconic C2→C1 clause order
CanE	Canadian English
CC	Comparative Correlative
CC'	C2C1 clause order construction
COCA	Corpus of Contemporary American English
CSAfE	Coloured South African English
CxG	Construction Grammar
cxn	Construction
DM	Dynamic Model
ec	empty category/trace/gap
EFL	English as a Foreign Language
ELF	English as a Lingua Franca
ENL	English as a Native/First Language
ESL	English as a Second Language
GhE	Ghanaian English
GloWbE	Corpus of Global Web-Based English
HCFA	Hierarchical Configural Frequency Analysis
HKE	Hong Kong English
ICE	International Corpus of English
ICE-GB	British English component of ICE
IDG	Indigenous strand
IndE	Indian English
IrE	Irish English
JamE	Jamaican English
KenE	Kenyan English

L1	first language
L2	second language
LNRE	Large Number of Rare Events
LOB	Lancaster-Oslo/Bergen Corpus of British English
MalE	Malaysian English
MET	Magnitude estimation test
MGG	Mainstream Generative Grammar
n.s.	not significant
NigE	Nigerian English
NP	Noun phrase
NZE	New Zealand English
OBJ	Direct Object
PakE	Pakistani English
PCE	Post-Colonial English
PdE	Present-day English
PGCH	Performance-Grammar Correspondence Hypothesis
PhiE	Philippines English
PP	Prepositional phrase
SAfE	South African English
SAI	Subject-auxiliary inversion
SC	Special Construction
SD	Standard deviation
SE	Standard error
SingE	Singapore English
SNC	Slovak National Corpus
SriLE	Sri Lankan English
STL	Settler/colonizer strand
TanzE	Tanzanian English
VP	Verb phrase
WSAfE	White South African English

1 Introduction

But the procedure of language is not simply one whereby a single phenomenon comes about; it must simultaneously open up the possibility of producing an indefinable host of such phenomena, and under all the conditions that thought prescribes. For *language is quite peculiarly confronted by an unending and truly boundless domain*, the essence of all that can be thought. It must therefore *make infinite employment of finite means* [...].

Wilhelm von Humboldt, *On Language* (1836) (emphasis JH)

Thus an *essential property of language is that it provides the means for expressing indefinitely many thoughts* and for reacting appropriately in an indefinite range of new situations [...]. Therefore it is quite proper for a grammar to discuss only *exceptions and irregularities* in any detail.

Noam Chomsky, *Aspects of the Theory of Syntax* (1965) (emphasis JH)

One of the most fundamental motivations for linguistic research is the question how speakers of a language are able to produce an infinite amount of grammatical sentences with a finite set of rules at their disposal (cf. von Humboldt 1836: 91), a trait that is generally considered an “essential property of language” (Chomsky 1965: 6). What drives every linguist’s endeavors is thus the desire to describe, as perfectly and exhaustively as possible, the system behind language that must be more abstract than the actual language produced on the ‘surface’. In the words of Fillmore et al., the question linguists strive to answer is thus “what it is that speakers know outright about their language and what it is that they have to be able to figure out” (1988: 502) – or, as Fried puts it, “discovering what constitutes speakers’ linguistic knowledge that corresponds to language use with native-like fluency” (2017: 243). However, any description of a system *below* the surface can only be abstracted from what is actually observable *on* the surface: language in use. It would be an understatement to say that linguists passionately disagree about the exact nature of this ‘language machinery’ and the workings of its ‘mechanics’ that allow for the potential of infinite creativity.

For well over half a century, the discipline of linguistics has been substantially influenced by a theoretical framework that is commonly referred to as Mainstream Generative Grammar (MGG, cf. Culicover and Jackendoff 2005: 3). It is characterized by a modular approach that assumes language to be “organized into components” (Croft and Cruse 2004: 225). Of these components, only the lexicon exhibits arbitrary and idiosyncratic phenomena, hence it is often referred to as a ‘lexical approach’ (cf. e.g. Müller 2019: 597ff.). MGG assumes that beyond the lexicon, all phenomena can be explained by means of “general rules” (Croft and Cruse 2004: 229) that are assumed to be innate, i.e., biologically hard-wired into human brains (cf. Chomsky 1965: section I.8). This implies that human languages have a “shared universal component” that has been referred to as Universal Grammar (UG) (Müller 2019: 145), a concept that, however, “remains controversial” (Müller 2019: 86).

The present investigation is rooted in a theory that takes a fundamentally different approach to explaining how language works. Known as Construction Grammar and commonly abbreviated as “CxG” (cf. Croft 2001a; Goldberg 2006, 2019; Hoffmann and Trousdale 2013a; Hoffmann 2017a,b), this is a theory of grammar that, in contrast to word-and-rules approaches such as MGG, does not assume a “clear-cut division of lexicon and syntax” (Hoffmann and Trousdale 2011: 2). In fact, CxG is a theory that “explicitly rejects the

[modular] classic lexicon-syntax distinction” of generative grammar (Hoffmann 2014b: 161). Instead, it assumes that the central building blocks of grammar at every linguistic level, from morphemes to complex syntactic patterns, are “constructions” (and not a set of rules, as in MGG), that is, “conventionalized form-meaning pairings” (Hoffmann 2013a: 308; Hoffmann 2014b: 161; Stefanowitsch and Gries 2005: 2; Hoffmann 2019: 6). This approach is also often referred to as ‘phrasal’ (as opposed to the ‘lexical’ approach, see above), because it “challenges the traditional verb-centered perspective that a verb mainly determines the overall sentence meaning” (Kim et al. 2020: 2), instead focusing on how meaning is generated not only by individual words, but also phrasal patterns (e.g. idioms or the ditransitive construction, see below).

Within CxG, there are several ‘schools’¹, of which the present study adopts the so-called usage-based approach. Based on psycho-linguistic findings, usage-based versions of CxG (Bybee 2006; 2010; 2012; Diessel 2015) maintain that any meaningful linguistic pattern that “occurs with sufficient frequency” will also be entrenched as a construction (Goldberg 2006: 5). While input frequency can thus lead to language-specific idiosyncrasies, usage-based CxG also assumes that across languages, speakers are affected by the same domain-general cognitive processes. Entrenched patterns (i.e., constructions) are stored in “mental constructional networks” (Hoffmann 2017b: 349, cf. also Croft and Cruse 2004: 262-265; Goldberg 2006: 215; Diessel 2015; Hoffmann 2019: 15). These networks are characterized by “massive redundancy and vastly rich detail” (Traugott and Trousdale 2013: 53) and constitute the “mental grammar” of a speaker (Hoffmann and Trousdale 2013a: 3), which has also been referred to as “construct-i-con” (Jurafsky 1992: 302; Goldberg 2003: 219). This term is “a morphological blend of construction and lexicon” (Ziem and Flick 2019: 203) and refers to “[t]he entire network of constructions constituting a grammar” (Ziem and Flick 2019: 203) – essentially, the machinery behind human language production. As noted by Bergs, this approach to language, which assumes an “item-based learning mechanism that rests on frequency and salience effects”, is different from MGG approaches in that it “does not assume an underlying grammatical competence in the Chomskian sense” (2018: 290).

An exhaustive account of the English construct-i-con is, by any means, a tall order: An endeavor akin to a medieval cartographer attempting to map out the globe in its entirety, down to the last creek and smallest hamlet. Nevertheless, it is possible to contribute to the ‘big picture’ by closely examining and mapping out small parts of it, contributing individual puzzle pieces to the grand ‘world map of grammar’. In this spirit, the present investigation will shed light on a minuscule piece of the language system puzzle, with the aim of improving our knowledge of the English construct-i-con and thereby contributing to the better understanding of the system behind human language that allows for infinite linguistic creativity. The puzzle piece that this investigation will examine is a construction that goes by the name *Comparative Correlative* (CC).

It is a construction that due to its “reputation of being irremediably quirky” (den Dikken 2005: 509) has attracted considerable attention by linguists. In fact, there is a large body of introspective studies of the CC in various languages (*inter alia* Fillmore 1987; McCawley 1988; Fillmore et al. 1988; Michaelis 1994; Beck 1997; Culicover and Jackendoff 1999; den Dikken 2003; 2005; Borsley 2003, 2004, 2011; Abeillé et al. 2006; Abeillé and Borsley 2008;

¹ An informative overview of the various constructional approaches is provided by Hoffmann and Trousdale (2013b), as well as Croft (2001: 58-59) and Croft and Cruse (2004: 57-90).

Gutiérrez-Rexach 2009; Sánchez López 2009; 2014; Taylor 2009; Sag 2010; Cappelle 2011; Kim 2011; Speyer 2011; Roig 2014; Zhan and Traugott 2020). More recently, there has also been an increasing number of smaller and larger corpus studies (Hoffmann 2014a; 2017b; 2018; 2019; Hoffmann et al. 2019; 2020; Horsch 2019; 2020; 2021). However, as will be shown, many questions and gaps in research remain. These will be addressed in the present study.

Transcending a ‘one-dimensional’ investigation of English CCs in the standard varieties British English and American English, the present study features a World Englishes approach: It examines and compares CCs across a range of English varieties that are at different evolutionary phases (henceforth referred to as ‘stages’) of Schneider’s (2007) Dynamic Model. It will thus be possible to demonstrate how domain-general processes affect the form of CCs across all varieties in the same or in similar ways. A further focus will be on the specific idiosyncrasies of each English variety and Dynamic Model stage. It will be demonstrated that there are linguistic features that correlate with certain Dynamic Model stages, proving its predictive power. Finally, it will be shown that a usage-based CxG approach is not only suitable for accounting for the evolution of World Englishes as posited in the Dynamic Model, but also for accommodating the many idiosyncrasies, or rather: construction-specific features of the CC that are common to all varieties.

The present study rests on two methodological pillars: First, a corpus study featuring over 10,000 CC tokens and second, introspective acceptability judgments obtained from almost 600 speakers of six different varieties of English. This methodology of combining corpus data with experimental results was inspired by a two-pronged approach advocated *inter alia* by Hoffmann, who refers to it as “corroborating evidence” (2011: 1), and McEnery and Wilson, who emphasize that the two data sources do not have to be “mutually exclusive” but can be “complementary” (2001: 16, as quoted by Hoffmann 2011: 1). The present investigation is based on data from altogether 20 varieties of English from stages II-V of Schneider’s Dynamic Model, obtained from three large (i.e., multi-million word) English corpora: the British National Corpus (BNC), the Corpus of Contemporary American English (COCA), and the Corpus of Global Web-based English (GloWbE). This corpus data is complemented by data obtained from acceptability judgment experiments conducted at four locations around the globe, chosen with the Dynamic Model stages in mind: USA (stage V), South Africa² (stages V/IV), Singapore³ (stage IV), and Kenya (stage III).

Thus, apart from shedding light on many interesting features of the English CC construction, the present investigation fills three large gaps in research that have been opened up by previous studies: It is the first (1) **large-scale corpus study** (i.e., based on data from multi-million word corpora) with a (2) **comparative dimension** (i.e., it examines and

2 With White South African English (WSAfE) classified as a stage V variety and Coloured (CSAfE) and Black (BSAfE) South African English classified as stage IV varieties. For a detailed discussion of the reasons for this categorization, see section 5.1.2.

3 As noted e.g. by Gupta (1994: 7) and Wee (2008a: 259), ‘Singapore English’ is not a monolithic entity. Rather, there is a continuum ranging from basilectal to acrolectal, and accordingly, two main sub-varieties of Singapore English are distinguished: Singapore Colloquial English (SCE) and Singapore Standard English (SStdE), where the latter is the more acrolectal variety. Since the data used in the present study was obtained in mostly formal contexts (written corpora and university students), in the present study the term ‘Singapore English’ will be equated with acrolectal SStdE, which “is the norm in [...] in education, and in all writing” (Gupta 1994: 7).

compares CCs across 20 varieties of English) that is (3) **corroborated by data obtained from introspective acceptability judgment experiments**. ‘Zooming out’ from the world map of grammar, this study will ultimately show how similarities across English varieties can be accounted for with domain-general cognitive principles, and reveal variety-specific idiosyncrasies that can be explained with input situations. Thus, apart from improving our knowledge of the English construct-i-con and thereby contributing to solving a part of the mystery of the language ‘mechanism’, the present study will also demonstrate the viability of the linguistic theory of usage-based Construction Grammar in accommodating phenomena that lexical approaches struggle with.

1.1 The Comparative Correlative (CC)

In Construction Grammar, constructions (i.e., form-meaning pairings which may be located anywhere along the lexicon-syntax cline, see above and section 1.2) are the primary object of linguistic analysis (cf. e.g. Fried 2017: 243). Consequently, any attempt at improving our knowledge of the large construct-i-con ‘world map’ of the language system must come from the examination, description, and comparison of individual constructions. In the last two decades, there has been a surge of CxG-based studies that have investigated various phrasal patterns and constructions, including the N *waiting to happen* construction (Stefanowitsch and Gries 2003), the dative/*to*-dative, active/passive, verb-particle, and *will-be going to* future alternations (Gries and Stefanowitsch 2004); the ditransitive construction (Gries and Stefanowitsch 2009); particle placement, genitive, and dative alternations (Szmrecsányi et al. 2016); and the *way*-construction (Brunner and Hoffmann 2020), to name but a few. The construction that the present investigation is concerned with typically looks like the following line (1.1) from a popular children’s song:

(1.1) [*The more we get together,*]_{C1} [*the happier we’ll be.*]_{C2}

As noted by Borsley (2003: 16), one of the earliest accounts of this construction dates to the 1960s (Ross 1967: section 6.1.2.6) but interest in them mostly gained momentum from the late 1980s onward – McCawley mentions that “[t]he first work in which I have seen [CCs] given a treatment that goes significantly beyond mere mention of their existence is Fillmore (1987)” (1988: 176). It has been referred to as “comparative conditional” (McCawley 1988), “*the X-er the Y-er* construction” (Fillmore et al. 1988) “proportional correlative” (den Dikken 2005), “covariational-conditional construction” (Goldberg 2003: 220), and “*the... the...* construction” (Cappelle 2011). In the following, the term “comparative correlative” will be adopted, which appears to have been first used by Culicover and Jackendoff (1999). However, all of the terms mentioned above refer to the construction exemplified by (1.1).

As (1.1) shows, the prototypical CC is a bi-clausal structure that encodes complex semantics. First, it carries an asymmetric cause-effect meaning (C1 → C2; ‘getting together results in happiness’). C2, consequently, can be described as the effect/apodosis/dependent variable⁴ of C1, which acts as the cause/protasis/independent variable (Goldberg 2003: 220, cf. also Beck 1997; Cappelle 2011; Hoffmann 2019). In addition to this conditional asymmetric cause-effect relationship between C1 and C2, CCs encode a further meaning:

4 As noted by Zhan and Traugott, the terms ‘dependent’ and ‘independent’ are taken from mathematics, where “[i]ndependent variables represent inputs or causes [and] [d]ependent variables represent the output or outcome” (2020: 93).

symmetric parallel change over time. This symmetric clause-internal semantics of C1 and C2 has been referred to as a “pair of semantic differentials” that is in a “monotonic relationship” (Sag 2010: 525–26; ‘as you get together more during a time period x , so you will get happier during a time period y ’). Example (1.2), based on (1.1), shows how these complex semantics may be paraphrased, based on Hoffmann’s semantic paraphrasing of CCs (2017b: 351):

(1.2) CC meaning

- C1: ‘There is a positive difference between how often you have been together at a point t_2 and how often you had been together at an earlier point in time t_1 ’
- C2: ‘There is a positive difference between how happy you are at a point t_2 and how happy you were at an earlier point in time t_1 ’
- Overall meaning: $C1 \rightarrow C2$

Semantically, CCs can thus be said to carry an asymmetric cause-effect meaning as well as a symmetric parallel-change-over-time meaning. They encode these complex semantics with an equally complex form: Each clause is introduced by a phonologically fixed clause-initial element ($[\delta\partial \dots]_{C1} [\delta\partial \dots]_{C2}$) that is followed by an obligatory comparative element slot that can be filled freely by speakers (in (1.1), *more* and *happier*). The clause slot that follows is optional, as strongly lexicalized idioms such as (1.3) demonstrate:

(1.3) [*The more,*]_{C1} [*the merrier.*]_{C2}

In fact, based on these four features⁵, in theory an infinite amount of novel CCs of varying complexity can be created, as has been noted by Hoffmann (2019: 151). This is not only the case in English; as Table 1.1 shows, it is a pattern found across language families and across the typological spectrum, from analytic (e.g. English) to synthetic (e.g. Slovak). Note, however, that there are subtle differences: For example, the phonologically fixed elements can vary slightly, as in Spanish, where their ending depends on the gender of the noun that follows (if that is the case), and they need not necessarily be clause-initial, as the example from Mandarin Chinese shows⁶. This has also been noted in the literature: Borsley writes that “it seems unlikely that languages vary without limit” (2003: 2) regarding the formal properties of the CC, and Culicover and Jackendoff state that “many other languages have similar constructions expressing the comparative correlative reading” (1999: 569). In a similar vein, den Dikken notes that “the morphosyntax of the comparative correlative exhibits a very high degree of cross-linguistic consistency” (2005: 528).

To account for the potential of infinite creativity of English CCs, Culicover and Jackendoff (1999: 567) have proposed the following maximally abstract template (1.4):

(1.4) [*the* [_{comparative phrase 1} (clause)]]_{C1} [*the* [_{comparative phrase 2} (clause)]]_{C2}

Templates such as (1.4) reflect an attempt at describing the system ‘under the surface’ of language: They try to account for the potential to create an infinite amount of CCs by means of a finite set of rules. However, such templates are not entirely satisfactory, a point which will be discussed in more detail below. First, however, a detailed discussion of the formal properties of the CC is in order.

5 That is, (1) phonologically fixed clause-initial elements, (2) obligatory comparative elements and (3) optional clause slots (4) in a bi-clausal structure.

6 Note that actually, *yùe* is “a transitive verb meaning ‘to exceed, to surpass’” (Zhan and Traugott 2020: 93) that, however, is construction-specific and thus very similar to the clause-initial elements in English CCs (for a more detailed discussion, cf. section 6.4).

Table 1.1 Overview of CCs in various languages

Language	Phonol. fixed C1	Phonol. fixed C2	Example	Source of example
Dutch	<i>hoe/des te</i>	<i>hoe/des te</i>	Hoe/des te meer je leest, hoe/des te minder je begrijpt/begrijp je. 'The more you read, the less you understand.'	den Dikken (2003: 2)
English	<i>the</i>	<i>the</i>	The more carefully you do your work, the easier it will get.	Fillmore (1988: 506)
German	<i>je</i>	<i>umso/desto/je</i>	Je mehr man drüber nachdenkt desto/umso/je interessanter wird es. 'The more you think about it, the more interesting it gets.'	Hoffmann (2014a: 28-29)
French	<i>plus</i>	<i>plus</i>	Plus je lis (et) plus je comprends. 'The more I read, the more I understand.'	Abeillé et al. (2006: 8)
Portuguese	<i>quanto</i>	∅	Quanto mais trabalhador fores, melhor aluno serás. 'The harder you work, the better you will be as a student.'	Sánchez López (2017: 681)
Spanish ⁷	<i>cuanto</i>	(<i>tanto</i>) ⁸	(a) Cuanto más leo, (tanto) más aprendo. 'The more I read, the more I learn.'	Abeillé et al. (2006: 7)
	<i>más</i>	<i>más</i>	(b) Más leo (y) más entiendo. 'The more I read, the more I understand.'	Abeillé et al. (2006: 7)
Italian ³	<i>quanto</i>	(<i>tanto</i>) ⁴	(a) Quanto più leggo, (tanto) più capisco. 'The more I read, the more I understand.'	Abeillé et al. (2006: 7-8)
	<i>più</i>	<i>più</i>	(b) Più leggo (e) più capisco. 'The more I read, the more I understand.'	Abeillé et al. (2006: 7-8)
Catalan	<i>quant</i>	<i>tant</i>	Quant major és l'honor, tant major és la carrega. 'The greater the honor, the bigger the career.'	Sánchez López (2017: 681)

(cont.)

7 Spanish and Italian speakers have “two distinct patterns for CCs” (Abeillé et al. 2006: 7) available to express the CC meaning; they are generally referred to as “asymmetric” (a) (*cuanto*_{C1}... (*tanto*_{C2})...) and “symmetric” (b) (*más*_{C1}... (y) *más*_{C2}...) (Abeillé et al. 2006: 7; Sánchez López 2017: 679). Abeillé et al. imply the same for Italian, noting that it “does not seem to differ from Spanish in any substantial way” (2006: 7-8). This also applies to the omission of *tanto*_{C2} (see below).

8 *tanto*_{C2} can be omitted (Cuervo 1954: 648; Abeillé et al. 2006: 7; Gutiérrez-Rexach 2009: 122; Sánchez López 2009: 179-80) in Spanish; Sánchez López claims this omission is restricted to colloquial language in Spanish (2009: 161). As with the two distinct (asymmetric and symmetric) patterns, Abeillé et al. (2006) imply that this feature also applies to Italian.

Table 1.1 (cont.)

Language	Phonol. fixed C1	Phonol. fixed C2	Example	Source of example
Romanian	<i>cu cât</i>	<i>cu atât</i>	Cu cât mașina merge mai repede, cu atât motorul face zgomot mai puternic. 'The faster the car goes, the louder the noise made by the engine is.'	Sánchez López (2017: 681)
Russian	<i>naskol'ko</i>	<i>nastol'ko</i>	Насколько лучше машина, настолько она дороже. [Naskol'ko luchshe mashina, nastol'ko ona dorozhe] 'The better the car, the more expensive it is.'	den Dikken (2005: 500)
	<i>chem</i>	<i>tem</i>	Чем больше вина, тем веселее. [Chem bol'she vina, tem veseleye.] 'The more wine, the merrier.'	den Dikken (2005: 500)
Polish	<i>im</i>	<i>tym</i>	Im więcej książek czytam, tym więcej rozumiem. 'The more books I read, the more I understand.'	Borsley (2004: 78)
Slovak	<i>čím</i>	<i>tým</i>	Čím menej reči tu bude, tým skôr zaspím. 'The less talking there is here, the sooner I will fall asleep.'	Horsch (2021: 194)
Greek	<i>oso</i>	<i>toso</i>	Oso pio poli diavazo, toso pio poli katalaveno 'The more I read, the more I understand.'	Borsley (2003: 16)
Maltese	<i>aktar</i>	<i>aktar</i>	Aktar ma jkun kiesah avukat, aktar ikollu success. 'The colder an attorney is, the more success he has.'	Beck (1997: 232)
Khalka Mongolian	<i>xedii</i>	<i>tädii</i>	Xedii targan max, (bol) tädii amttai. 'The fatter a piece of meat is, the more delicious it is.'	den Dikken (2005: 500)
Hungarian	<i>minél</i>	<i>annál</i>	Minél többet olvasol, annál többet {megértesz / értesz meg.} 'The more you read, the more you understand.'	den Dikken (2005: 500)
(Mandarin) Chinese	<i>yuè</i>	<i>yuè</i>	Xiǎoli yùe zhǎng yùe měi. 'The more Xiaoli grows, the more beautiful she is.'	Zhan and Traugott (2020: 84)
Welsh	<i>mwy</i>	<i>mwy</i>	Mwy dw i 'n ddarllen, mwy dw i 'n ddeall. 'The more I read, the more I understand'	Borsley (2003: 17)
Hindi	<i>jitnaa</i>	<i>utnii(-hii)</i>	Jitnaa suuraj chamk-aa utnii(-hii) ThanD baRh-ii. 'The more the sun shone, the colder it got.'	den Dikken (2005: 499)

As has been noted previously (by e.g. McCawley 1988; Borsley 2003, 2004; den Dikken 2005; Fillmore et al. 2007; Sag 2010; Hoffmann 2014a; Hoffmann 2019: 50), the comparative element that fills the comparative phrase slot in C1 and C2 (henceforth referred to as ‘filler’) can be an adjective phrase (AdjP) (1.5), an adverb phrase (AdvP) (1.6), a noun phrase (NP) (1.7), a prepositional phrase (PP) (1.8) or a so-called “Special Construction” (SC) (1.9):

(1.5) [*The **more balanced***]_{AdjP} *your life is,*_{C1} [*the **happier***]_{AdjP} *you will be.*_{C2}

(1.6) [*The **harder***]_{AdvP} *you work,*_{C1} [*the **better***]_{AdvP} *you will sleep.*_{C2}

(1.7) [*The **more junk food***]_{NP} *you consume,*_{C1} [*the **more health problems***]_{NP} *you are going to have.*_{C2}

(1.8) [*The **more in style***]_{PP} *you dress,*_{C1} [*the **more in fashion***]_{PP} *are going to be.*_{C2}

(1.9) [*The more in control you are of your motorcycle,*]_{C1} *the **better a rider***_{SC} *you are.*

(GLOWBE-PK wlp_pk_jww/wlp_pk_b01 blog ##3491447 Line: 24)

The ‘Special Construction’ has been thoroughly discussed previously (McCawley (1988); Borsley (2003, 2004); den Dikken (2005); Fillmore et al. (2007: 20-22); Sag (2010: 493); Hoffmann (2019: 50)); Hoffmann et al. note that “what is special about these constructions is that pronominal elements [...] do normally not precede indefinite articles” (2019: 5). However, while interesting from a syntactic point of view, special constructions have also been “identified as strongly disfavored”, appearing with very low frequencies in corpus data (Hoffmann 2019: 108), so that they will be disregarded in the present study.

Moving on to the optional clause slot, CCs exhibit deletion and truncation phenomena that would be ungrammatical in corresponding declarative clauses. It has been noted (by e.g. McCawley 1988; Culicover and Jackendoff 1999; Borsley 2003, 2004; Hoffmann 2014b; 2019; Hoffmann et al. 2019) that the verb BE can be deleted in both C1 and C2, as example (1.10) from Huddleston (2002: 1136, cited in Hoffmann 2019: 3) shows:

(1.10) [*The greater the demand **is**,*]_{C1} [*the higher the price **is**.*]_{C2}

In a declarative clause, such deletion of BE would be ungrammatical (**The demand is greater / *The price is higher*). This is thus a property that “distinguishes CCs from *if*- and *as*-clauses”, and one which speakers have to learn as “construction-specific” (Hoffmann 2019: 3).

Truncation is a further construction-specific phenomenon that would be ungrammatical in declarative clauses. It has resulted in well-known lexicalized examples such as (1.3) (cf. Croft and Cruse 2004: 234; Fillmore et al. 1988: 506), which demonstrate that in English CCs, the clause slot can be omitted altogether, resulting in truncated structures that consist of merely the clause-initial elements and comparative phrases. This is illustrated by the following examples (1.11a-c) from Huddleston (2002: 1136, cited in Hoffmann 2019: 51):

(1.11) a. [*The lower **the price is**,*]_{C1} [*the more interesting the product is.*]_{C2}

b. [*The lower the price is,*]_{C1} [*the more interesting **the product is**.*]_{C2}

c. [*The lower **the price is**,*]_{C1} [*the more interesting **the product is**.*]_{C2}

As Hoffmann (2019: 3) notes, for the most part CCs have been analyzed introspectively with an MGG-based approach so far. This has led to a proliferation of studies that propose maximally abstract rules (e.g. den Dikken 2005: 516) to account for the formal properties of CCs. Adherents of the MGG approach assume that CCs belong to a family of construction types called “filler-gap constructions”, which are structures “broadly similar to *wh*-

interrogatives, exclamatives and *wh*-relatives” (Borsley 2004: 73). In filler-gap constructions the filler, which would be located in postverbal position in corresponding declarative clauses (1.12), is found clause-initially. The following examples, taken from Hoffmann et al. (2019: 2), show that apart from CCs (1.16), filler-gap constructions include WH-questions (1.13), WH-relative clauses (1.14), and topicalized clauses (1.15). In each example, the ‘gap’ from which the postverbal element has been removed is indicated with ‘ ’:

(1.12) Declarative clause:

- a. *Ben was [tired].*
- b. *He made [mistakes].*

(1.13) WH-question:

- a. [*What*]_i *was Ben* _i?
- b. [*What*]_i *did he make* _i?

(1.14) WH-relative clause:

- a. *A pilot shouldn't be tired, [which]_i Ben was* _i.
- b. *The mistakes [which]_i he made* _i ...

(1.15) Topicalized clause:

- a. [*Tired*]_i *Ben was not* _i.
- b. [*Mistakes*]_i *he made* _i.

(1.16) Comparative Correlative:

- [*The [more tired]_i Ben was* _i]_{C1}
- [*The [more mistakes]_i he made* _i]_{C2}

Since the focus of present investigation is on a CxG-based account of CCs, a more detailed discussion of MGG-based analyses of the CC will not be pursued at this point⁹. Suffice it to say that the many introspective analyses that have been put forward for CCs in English and other languages (e.g. Borsley 2004; den Dikken 2005; Abeillé et al. 2006) try to account for CCs with “a maximally schematic and economic analysis” (Hoffmann et al. 2019: 3), e.g. a transformational operation referred to as A-bar movement or WH-movement (cf. Chomsky 1981; 1995; 2000; 2001), or constructional templates like Culicover and Jackendoff’s (1999: 567; cf. above). They have in common a reductionist approach that seeks to find maximally abstract rules to account for CCs. Sag, for example, posits no more than two constraints to account for CCs, a “The-clause construction” and a “Comparative-Correlative construction” (2010: 537). Similarly, Culicover and Jackendoff provide only one constructional template (1.4) to account for all possible CCs (1999: 567). Such approaches assume that not only can the slots in CCs be filled freely, but that C1 and C2 are “licensed separately” from each other (Hoffmann et al. 2019: 3). In other words, C1 and C2 are treated as independent immediate constituents of a CC construction, implying that what happens lexically and syntactically in C1 is completely independent from what happens in C2 in this regard. In essence, this is a context-free grammar account, a view that is assumed implicitly by many, e.g. Fillmore (1987), Fillmore et al. (1988), McCawley (1988), Culicover and Jackendoff 1999 (567), Michaelis (1994), Borsley (2003, 2004), den Dikken (2005), Cappelle (2011), Kim (2011), and is even explicitly expressed by others, e.g. Sag (2010).

⁹ For a detailed summary of previous MGG-based analyses of the CC, the reader is referred to Hoffmann (2014a, 2019) and Hoffmann et al. (2019).

However, recently there have been several CxG-based corpus studies whose results suggest that such a reductionist approach is insufficient, providing compelling evidence that the syntax of C1 and C2 is all but context-free. In several smaller studies based on data from the Brown University Standard Corpus of Present-Day American English (BROWN) and International Corpus of English (ICE) corpus families, Hoffmann (2014a,b; 2019) determined statistically significant cross-clausal associations regarding lexical filler words in C1 and C2 (e.g. *more*_{C1} × *more*_{C2} or *less*_{C1} × *better*_{C2}) and reduction patterns (e.g. if BE was deleted in C1, it was also omitted with a statistically significant probability in C2).

These results were corroborated in two recent corpus studies that were considerably larger in scale: Hoffmann et al. (2019; cf. also Hoffmann 2019), by means of covarying-collexeme analyses (Stefanowitsch and Gries 2005: 9–11), confirmed the existence of an even greater number of statistically significant cross-clausal associations in a sample of more than 1,400 CC tokens from COCA. These associations included lexical fillers (e.g. *sooner*_{C1} × *better*_{C2}) (1.17), filler types (e.g. AdjP_{C1} × AdjP_{C2}) (1.18), and deletion patterns (e.g. BE-DELETED MAIN VERB_{C1} × BE-DELETED MAIN VERB_{C2}) (1.19). Moreover, Hoffmann et al. (2020) found almost exactly the same cross-clausal associations in a data set of 2,012 CC tokens from the BNC.

(1.17) [*The sooner*]_{C1} [*the better*]_{C2}

(1.18) [*the [larger]*_{AdjP} *the disks*]_{C1} [*the more [un-sharp]*_{AdjP} *the image on the screen will appear to be*]_{C2}

(COCA wlp_academic_rpe/wlp_acad_1993 ##4018017 Line: 13)

(1.19) [*The better the preparation is*]_{C1} [*the stronger the memory is*]_{C2}

(COCA wlp_magazine_qri/wlp_mag_2000 ##2034384 Line: 65)

Such cross-clausal associations¹⁰ come with serious implications for templates and maximally abstract rules that presuppose the independent realization of C1 and C2. As Hoffmann et al. note, the cross-clausal associations that they found in their corpus data “cannot be captured by approaches that only postulate an abstract template” (2019: 24) – the interdependence of the C1 and C2 slots is “a constraint that cannot be captured by any [...] analyses of CCs that treat the two daughter nodes (C1 and C2) as independent slots” (Hoffmann et al. 2019: 7). Moreover, MGG-based analyses have tried to argue that the CC’s “idiosyncras[ies] reside wholly in the lexical domain, not in the syntax” (den Dikken 2005: 529). Cross-clausal associations, however, are syntactic patterns that clearly cannot be explained away as “lexical quirks” (den Dikken 2005: 529).

From a Usage-based CxG perspective, such observations, which point to the existence of a complex network of interdependent templates, also raise questions as to how CCs are stored in the mental network of English speakers. The existence of cross-clausal associations suggests that there are so-called meso-constructions, i.e. partly filled and partly schematic constructions, at a level somewhere in between the macro-level (i.e., the most abstract, schematic level) and the micro-level (i.e., the most concrete level).

Apart from lexical and syntactic interdependencies between C1 and C2, there are further reasons why maximally abstract analyses of CCs are problematic. First, there are so-called CC’ structures (Culicover and Jackendoff 1999: 549) in which the apodosis (C2) precedes the

10 Such cross-clausal associations are not restricted to English CCs. For example, Horsch (2021) determined six statistically significant cross-clausal patterns in a 500-token sample from the Slovak National Corpus (SNC).

protasis (C1) without changing the overall semantics (i.e., cause-effect and simultaneous change over time) of the construction, as exemplified by (1.20), a variation of (1.1):

(1.20) [*We'll be (the) happier*]_{C2} [*the more we get together*]_{C1}

The relationship between the CC' construction with a C2C1 order and the 'standard' CC with a C1C2 order has been subject to much debate: While den Dikken acknowledges the existence of the CC' in English, he claims that it "should be kept separate from the comparative correlative" due to an absence of what he calls the "correlative particle" (i.e., the clause-initial element) *the* in the C2 clause (2005: 513). However, as Hoffmann has shown using corpus data, the C2 clause-initial element is sometimes realized in English CC' structures (2019: 103), and in other languages, both clause-initial elements are obligatory in the C2C1 order (e.g. German and Slovak). This indicates that CC' structures are indeed part of the CC network, something that maximally abstract templates and rules cannot account for.

Of course, the question remains what the function of the C2C1 order is. It will be argued that the use of C2C1 structures can be attributed to pragmatic principles, in line with Corollary A to Goldberg's Principle of No Synonymy: When "two constructions are syntactically distinct and [semantically] synonymous", they must differ regarding pragmatics (1995: 67), i.e. one must have a communicative purpose that the other doesn't have. This is also reflected in Hoffmann's claim of a "functional differentiation" between the C1C2 and C2C1 order that results in a pragmatic difference (2019: 157). Support for this claim comes from previous corpus investigations, which have shown that the C2C1 order is in fact strongly dispreferred in English¹¹, with ratios of 37:1 (Hoffmann 2018: 193) and 15:1 (Hoffmann et al. 2020: 204) in favor of C1C2, although from a diachronic perspective, the C2C1 order was established in English long before C1C2 became dominant (Hoffmann 2019: 54-60).

Furthermore, there are "stacked" (Hoffmann 2014a: 166; 2019: 168) CCs which usually consist of three clauses. It is important to note that the focus of the present study is on stacked CCs without any connectors (e.g. the conjunction *and*) between the subclauses. In stacked CCs, each clause (except for the first and last) functions as protasis and apodosis simultaneously, as example (1.21) shows:

(1.21) [*The more I see*]_{C1} [*the less I know*]_{C2} [*the more I like to let it go*]_{C3}
(Red Hot Chili Peppers – *Snow (Hey Oh)*)

Phenomena such as cross-clausal associations (1.17-1.19), CC' structures (1.20), and stacked CCs (1.21) do not only show that maximally abstract rules and templates (1.4) like Culicover and Jackendoff's (1999: 567) are insufficient to fully account for the entire spectrum of forms that the CC comes in. They also have serious implications for the analysis of C1 as subordinate/relative and C2 as main/matrix clause, a common point of contention in the literature: While Culicover and Jackendoff, for example, posit a "paratactic (i.e., quasi-coordinate syntax)" (1999: 551), den Dikken (2003; 2005) uses several features to argue against such an analysis, instead claiming that CCs in English are hypotactic structures.

Firstly, den Dikken mentions optional subject-auxiliary inversion (SAI) (2003: 1-2) in C2¹² (1.22) as evidence of hypotaxis in CCs (example from Hoffmann et al. 2020: 199):

(1.22) [*The more they work*]_{C1} [*the more [I will / will I]_{SAI} pay them*]_{C2}

11 The same applies to German (cf. Hoffmann 2018) and Slovak (cf. Horsch 2021).

12 The ungrammaticality of SAI in C1, on the contrary, is undisputed (cf. Culicover and Jackendoff 1999: 559; den Dikken 2003: 2).

However, corpus studies have revealed SAI in C2 to be a low-frequency phenomenon, making up no more than 3% of total CC tokens in Hoffmann’s COCA data (2019: 127), and barely 10% in Hoffmann et al.’s BNC data (2020: 205). This reflects Culicover and Jackendoff’s claim that SAI occurs “marginally [...] in C2 but not C1” (1999: 559) and Hoffmann’s statement that it is generally “optional” but “disfavoured” in C1 (2014a: 94).

Secondly, den Dikken claims that optional *that*-complementizers in C1 (1.23) are evidence of its subordinate status (example from Hoffmann et al. 2020: 199):

(1.23) [*The more [that]_{THAT-complementizer} he says,*]_{C1} [*the less I wanna say.*]_{C2}

Again, previous corpus studies have shown *that*-complementizers in C1¹³ to be an extremely rare phenomenon, with no more than 2% of total CC tokens containing them, in both Hoffmann’s COCA data (2019: 125) and Hoffmann et al.’s BNC data (2020: 205).

Finally, den Dikken discusses object pronoun extraction in embedded clauses from C1 (1.24a), C2 (1.24b), and both subclauses (1.24c) (examples from den Dikken (2005: 504; *ec* = empty category/trace/gap)):

(1.24) a. a person who [*the more you meet ec*], [*the more you hate him*]

b. a person who [*the more you meet him*], [*the more you hate ec*]

c. a person who [*the more you meet ec*], [*the more you hate ec*]

While Culicover and Jackendoff maintain that “across-the-board extraction” (ATB) (1999: 564) from both CC clauses (1.24c) constitutes proof that C1 and C2 “have the status of coordinate clauses” (1999: 567), den Dikken claims that English is idiosyncratic in this respect, and that the examples (1.24a-c) do “not represent the extraction possibilities of comparative correlatives universally” (2005: 504). Rather, he treats C1 as an adjunct clause and analyzes the gap in C1 as a parasitic gap, i.e., a gap that depends on the presence of another gap resulting from ‘true’ extraction, in this case from C2 (den Dikken 2005: 507).

Thus, in addition to the question how English CCs are stored in the mental constructional network, there are idiosyncrasies (SAI, *that*-complementizers, and extraction phenomena) that raise questions about the syntactic relationship between C1 and C2. It will be argued that the evidence from the corpus data and experiments presented here strongly supports an analysis of hypotactic features in English CCs as “no longer central properties” but rather “historical remnants” (Hoffmann et al. 2020: 200), suggesting that in Present-day English (PdE), CCs are predominantly paratactic structures. This is supported by the fact that in previous corpus studies (e.g. Hoffmann et al. 2019; Hoffmann et al. 2020), an overwhelming majority of meso-constructions (i.e., cross-clausal associations, see above) had a parallel structure.

At this point it must be noted that English CCs have not always been paratactic structures. As Hoffmann has shown in detailed diachronic analyses (2017b, 2019), CCs were unambiguously hypotactic in late Old English (OE), with C2 acting as main clause and C1 as corresponding subordinate clause (as is still the case in other languages today, e.g. German). Beginning in the Middle English (ME) period, C1 and C2 became increasingly similar, however; a development that resulted in the distinct symmetric form of CCs in PdE, including identical clause-initial elements (*the_{C1}... the_{C2}...*) and parallel constituent order¹⁴ in C1 and C2.

13 Note that both Hoffmann’s (2019) COCA data and Hoffmann et al.’s (2020) BNC data contained sporadic instances of *that*-complementizers in C2 (6/1,409 tokens in COCA and 2/2,041 tokens in BNC). *That*-complementizers in C2 are discussed in more detail in section 3.1.1.

The above observations, especially symmetric cross-clausal associations, lead to questions about the syntactic relationship between C1 and C2 that are difficult if not impossible to resolve using an MGG approach. After all, this is an approach that relies on introspection and seeks to explain the creative potential of CCs by means of maximally abstract rules, assuming a clear-cut division between lexicon and syntax. As has been discussed, however, the interdependence of slots in C1 and C2 cannot be accounted for by an analysis that treats C1 and C2 as daughter nodes and thus, syntactically independent slots¹⁵. Rather, the existence of cross-clausal associations suggests that these are phenomena located on a cline somewhere between lexicon and syntax, or concrete and abstract.

A theoretical framework that is much better suited for accounting for such ‘mixed’ phenomena is usage-based Construction Grammar, which, as has been discussed above, explicitly discards the notion of a modular system behind language and assumes “a continuum of schematicity or abstractness” (Diessel 2015: 297), i.e., a lexicon-syntax cline along which form-meaning pairings of varying degrees of complexity are located, and assumes a network of constructions that are located at levels ranging from a concrete micro- via various meso- all the way to a maximally abstract macro-level.

1.2 Usage-based Construction Grammar and CCs

As Traugott and Trousdale have noted, usage-based approaches to language emerged as early as the 1920s (2013: 46). However, they were largely displaced by generative grammar approaches in the course of the 20th century. Thus, usage-based Construction Grammar (Goldberg 2003; 2006; Bybee 2006; 2010; 2013; Croft 2001; Goldberg 2006; Hoffmann and Trousdale 2013a) is a theoretical framework that has seen increasing popularity only in the last three decades or so, but has since received considerable support from psycho- and neurolinguistics (Bencini 2013; Pulvermüller, Shtyrov and Capelle 2013) as well as research on L1 (Diessel 2013) and L2 (Ellis 2013) acquisition. As a cognitive approach to language, it emphasizes language use as a “complex and dynamic activity” (Traugott and Trousdale 2013: 47) that results in the abstraction of schematic representations – in other words, “knowledge of language emerges from language use” (Croft and Cruse 2004: 3). This is, in essence, a “bottom-up” approach (Taylor 2002: 592) that assumes that “language is acquired through exposure to actual usage events” (Traugott and Trousdale 2013: 48) – hence the term ‘usage-based’. Note that this bottom-up approach stands “in stark contrast to Universal Grammar (Chomsky 1995, 2001)” (Hoffmann 2019: 194), a theory that features a ‘top-down’ approach to grammar (cf. Langacker 1988: 262). Under this approach, as noted by Currie, “the starting point of analysis is a maximally general description or rule, and priority is given to generalisations in the form of rules over the description of (reputedly) less systematic features” (2000: 205).

14 As corpus studies (e.g. Hoffmann et al. 2020) have shown, SAI in C2 is an infrequent phenomenon that can no longer be described as a central property of the PdE CC.

15 Note, however, that this claim does not discard the notion of a maximally abstract template, i.e., CC macro-construction. Rather, what needs to be considered is “an analysis of English CCs that allows for both a maximally abstract macro-construction as well as more specific meso-constructions”, which is only possible “if one adopts a usage-based constructionist approach” (Hoffmann et al. 2019: 26).

The CxG approach can thus be seen as “a response to the model of grammatical knowledge [of] generative grammar” (Croft and Cruse 2004: 225). In particular, MGG had difficulty accounting for structures with non-compositional meaning, such as idiomatic expressions (e.g. *kick the bucket*), which Croft and Cruse define as “grammatical units larger than a word which are idiosyncratic” (2004: 230) and whose “meaning or use can’t be predicted” (Nunberg et al. 1994: 493, cited in Croft and Cruse 2004: 230). In fact, idioms play a central role in CxG and its challenging of traditional MGG assumptions: Stefanowitsch and Gries have noted that “grammar and lexicon are not fundamentally different, and that the long-ignored multi-word expressions serve as an important link between them” (2003: 210).

CxG assumes the existence of constructions, i.e., “conventionalized form-meaning pairings” (Hoffmann 2013a: 307) that can be located anywhere along a continuum that represents a “gradation from contentful/lexical to procedural/grammatical” (Traugott and Trousdale 2013: 73, see also Hilpert 2013: 5). In other words, constructions in the CxG sense can be seen as an extension of Ferdinand de Saussure’s concept of the linguistic sign, i.e., an arbitrary symbolic relationship between form and meaning (1916: 101) that applies to any and all linguistic material, from morphemes to complex syntactic patterns (Goldberg 2003). Based on the Saussurean sign, Goldberg thus defined constructions as follows (1995: 4):

C is a CONSTRUCTION if and only if C is a form-meaning pair $\langle F_i, S_i \rangle$ such that some aspect of F_i or some aspect of S_i is not strictly predictable from C’s component parts or from other previously established constructions.

As will be argued below, this definition also applies to CCs, whose semantics cannot be entirely predicted from their formal features. What is important to know is that on the meaning side, constructions entail more than just the ‘lexical’ meaning of a sign: Beyond semantics, it includes pragmatics and discourse function. The form side entails syntax, morphology, and phonology (Croft 2011, as cited by Zhan and Traugott 2020: 85). Figure 1.1 illustrates this concept of constructions.

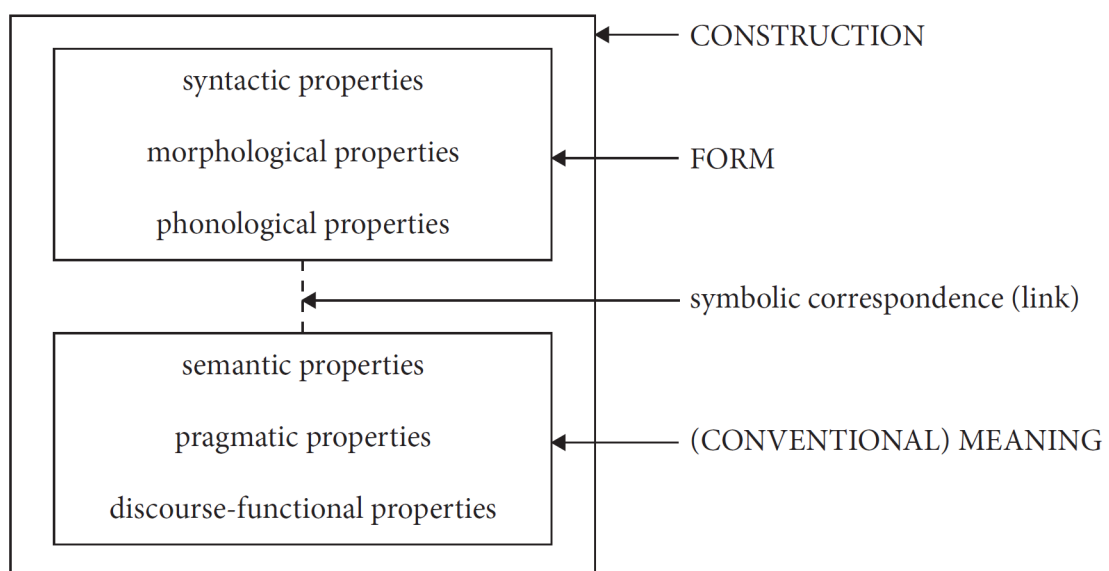


Figure 1.1 Illustration of a construction according to the CxG approach (Croft 2001: 18)

Thus, CxG is a model of grammar that is explicitly “non-modular” (Traugott and Trousdale 2013: 73) and thus “defies a strict separation between grammar and lexicon” (Fried 2017: 244). Under this approach, idioms are considered constructions in their own right, with their own meaning and a corresponding form consisting of fixed lexical material and abstract, schematic slots. Table 1.2 provides examples of constructions ranging from contentful to procedural.

Table 1.2 Examples of constructions along the lexicon-syntax continuum

Form	Meaning	Example(s)	Type
{ <i>vulture</i> }	‘a rapacious person’	<i>Simon is a real vulture.</i>	fully substantive (lexically fixed)
N + { <i>s</i> }	‘possession’	<i>Annie’s car.</i>	partly substantive, partly schematic
S + { <i>spill</i> } <i>the beans</i>	‘divulge information’	<i>John finally spilled the beans.</i>	partly substantive, partly schematic
S + { <i>kick</i> } <i>the bucket</i>	‘die’	<i>Jeff’s dog kicked the bucket.</i>	partly substantive, partly schematic
S ₁ + V ₂ + IO ₃ + DO ₄	agent ₁ causes ₂ recipient ₃ to receive theme ₄ by V-ing	<i>She bought him an ice cream.</i> <i>Sue baked Steve a cake.</i>	fully schematic

While non-modular approaches include morphemes, words, and “compositional and non-compositional lexically filled patterns” (Schmid and Küchenhoff 2013: 566), they can also account for idioms such as *spill the beans* and their non-compositional meaning, and even fully schematic patterns, which are commonly referred to as “argument-structure constructions” (cf. e.g. Goldberg 2003: 220), such as the ditransitive construction. Note that in the second example of the ditransitive construction, *Sue baked Steve a cake*, the monotransitive verb ‘to bake’ is used ditransitively, something that should not be possible under a lexical approach. Nevertheless, any speaker of English will intuitively understand the sentence. In CxG, the assumption is that the ‘ditransitive’ meaning is generated by the entire phrasal pattern (and not just the verb). As noted by Kim et al. (2020: 2, who refer to Goldberg 1995, 2013; Goldberg et al. 2004):

Instead of relying exclusively on the verb’s role, the constructional view proposes that a language user derives a sentence’s meaning by integrating lexico-semantic information provided by a verb with constructional information [...].

In fact, any verb may be used in the ditransitive construction’s V slot, with the construction retaining the ‘transfer’ meaning: agent₁ causes₂ recipient₃ to receive theme₄ by V-ing¹⁶.

As noted by Diessel, under this view CCs are also idioms¹⁷, in a sense that they are non-compositional, “consisting of a lexically-specific frame, two comparative adjectives, and two slots that may or may not be filled by regular expressions” (2015: 300). The term ‘idiom’

16 The ditransitive construction’s ‘transfer’ meaning is commonly also paraphrased as [X CAUSE Y to RECEIVE Z] (e.g. Traugott and Trousdale 2013: 59).

17 Croft and Cruse use the term “extragrammatical idioms” (2004: 233) in this regard, indicating that CCs belong to one of several sub-categories of idioms. This distinction, however, is irrelevant here.

implies that the meaning they carry “cannot be parsed by the general syntactic rules for the language” (Croft and Cruse 2004: 233). For example, at first sight the clause-initial elements *the*_{C1}... *the*_{C2}... seem rather inconspicuous because they look like definite articles¹⁸. Taking a closer look, however, they appear puzzling: They do not at all behave like definite articles – in fact, they are so unusual that den Dikken refers to them as “perhaps the most mysterious ingredient of the English comparative correlative” (2005: 516). While the standard grammars of English have little to say about this phenomenon – Quirk et al., for example, simply refer to them as a “unique pair of proportional correlatives” (1985: 1000) – it has been examined in more detail elsewhere. As early as the 1980s, Fillmore et al. noted that “the use of the definite article that we find in this [CC] construction is not [...] found generally elsewhere in language” (1988: 507), prompting them to pose the question: “Do we, indeed, have the right to describe the *the* here as the definite article?” (1988: 508). Den Dikken refers to them as “degree words” because they can be paraphrased with “the measure by/degree to which” (2005: 515; as noted by Hoffmann et al. 2020: 197), and Goldberg notes that *the* “normally occurs at the beginning of a phrase headed by a noun [b]ut in this construction [...] requires a comparative phrase” (2003: 220; cf. also Croft and Cruse 2004: 235). Goldberg also mentions the difficulty of classifying C1 and C2 (are they noun phrases or clauses?) and the absence of a conjunction between C1 and C2 as a “non-predictable aspect” (2003: 220) of the CC, prompting questions about the syntactic relationship between C1 and C2¹⁹. Accordingly, Culicover and Jackendoff argue that the structural dependency between C1 and C2 is “*sui generis*”, i.e. construction-specific, and cannot be accounted for with a minimalist, that is, MGG-based approach (1999: 568).

In other languages, e.g. Spanish, this has led some to conclude that “not only can this form of correlative [CC] conjoining not be a form of complementation but that it can neither be accounted for in terms of any of the other two established recursive processes” known in generative grammar²⁰ (Knowles 1978: 221-2). CxG offers a considerably more efficient

18 The author is aware that historically, *the*_{C1}... *the*_{C2}... “go back to the instrumental demonstrative” in OE (den Dikken 2005: 518). This analysis, however, does not have any implications for a synchronic analysis under which the average speaker of a language is not aware of the diachronic evolution of the forms he uses.

19 This applies to the CC in other languages as well: For Spanish, Sánchez López speaks of the “difficulty of classifying” (*dificultad de clasificación*) CCs and notes that they “do not appear to fit to any [syntactic] category” (*no parecen encajar en ningún sitio*). She also notes that in the literature, there has been “no unanimous answer to the question” (*no han dado una respuesta unánime*) as to whether CCs are hypotactic or paratactic (2009: 163), concluding that CCs must have a special status among subordination (2009: 192). She also notes how “very remarkable” it is “that the formal devices to express copulative correlatives in most Romance languages coincide with the ones used to build comparative correlatives” (2017: 680), only to concede later that CCs “cannot be considered coordinated structures” despite a “formal similarity” (2017: 681). Abeillé et al., in their comparative analysis of French and Spanish CCs somewhat vaguely conclude that “CCs require special constructions” (2006: 7) and speak of a “non standard type of subordinate construction” (2006: 18). Similarly, as Horsch has pointed out, “in Slovak C1 has been analyzed as subordinate and C2 as matrix/main clause based on the clause-initial elements”, while arguing “that that [the clause-initial elements] should be viewed not as pronominal elements, but rather ‘construction-specific’ elements that introduce C1 and C2”, with corresponding implications for a hypotactic analysis of the Slovak CC (2020: 36).

20 As a solution, Knowles proposes that “a fourth sentential recursive device must be recognized” (1978: 221), essentially suggesting a separate category for CCs that is neither paratactic nor hypotactic, as also noted by Sánchez López in the context of her introspective CC study (2009:

solution²¹ to this problem by simply assuming a ‘Comparative Correlative construction’ that “specifies [its] particular form and semantic function” (Goldberg 2003: 220), thus eliminating the need for lengthy and cumbersome analyses of the formal and semantic compositionality of the construction, as has been attempted in previous introspective studies (e.g. Borsley 2003, 2004; den Dikken 2005; Abeillé et al. 2006). The CC construction, with its “complex form and [...] complex meaning that are linked by an arbitrary symbolic relationship” (Hoffmann et al. 2019: 26), thus fulfilling all requirements of Goldberg’s definition of construction (see above), is perhaps best illustrated by Hoffmann et al.’s (2019) representation (1.25). Its form side is based on Culicover and Jackendoff’s (1999) template (see (1.4) above), and its meaning side is based on Hoffmann’s semantic paraphrase²² (2017b: 351, see example 1.2).

(1.25) **Abstract CC construction** (Hoffmann et al. 2019: 26)

FORM:	[ðə [] _{comparative phrase1} (clause ₁)] _{C1} [ðə [] _{comparative phrase2} (clause ₂)] _{C2}
MEANING:	‘[As the degree of comparative phrase1 increases/decreases with respect to clause ₁] _{independent variable} [so the degree of comparative phrase2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way

Note that apart from accommodating the complex semantics of CCs, this ‘formula’ also accounts for the various formal idiosyncrasies of the CC pattern. For example, the fixed clause-initial elements, a common property of CCs across languages (see Table 1.1), can be designated “construction-specific elements” (Horsch 2019: 182), thereby avoiding lengthy, tedious, and ultimately inconclusive considerations about their part of speech and the syntactic status of C1 and C2, which has often been determined based on the clause-initial elements (see footnotes 18 and 19). Also note that this template can be adjusted to accommodate cross-clausal phenomena, and thus so-called meso-constructions (i.e., more concrete and substantive CC constructions).

Now, usage-based approaches assume that constructions are stored in a “structured inventory of conventional linguistic units” (Langacker 2008: 222), i.e., a mental grammar “formed by frequently encountering specific utterances which lead to the entrenchment of patterns” (Horsch 2021: 195). An example of how such a network may be visualized is provided in Figure 1.2, taken from Langacker (2008). In Langacker’s illustration, “[t]he individual nodes [...] can be structures of any kind or degree of complexity”, and “the thickness of boxes [...] is a measure of each unit’s entrenchment”, where the “most entrenched [...] unit [...] can [...] be recognized as the category prototype” (2008: 226). As indicated by the different line types, there are different kinds of links. These are commonly referred to as ‘relational’ and ‘inheritance’ links²³.

164). This illustrates that the parataxis-hypotaxis debate is not restricted to English CCs.

21 Note that it is not claimed that a CxG approach is the *only* approach able to accommodate CCs. However, it appears to be considerably less complicated and cumbersome than the various generative grammar accounts of the CC that have been put forward. Thus, applying Occam’s razor, the CxG approach certainly is preferable.

22 As noted by Hoffmann et al. (2019: 26), this semantic paraphrase is based on Sag (2010: 525-526); Dayal (1996); Beck (1997); Brasoveanu (2008) and Cappelle (2011).

23 For a detailed description of these terms, see Traugott and Trousdale (2013: 59-62).

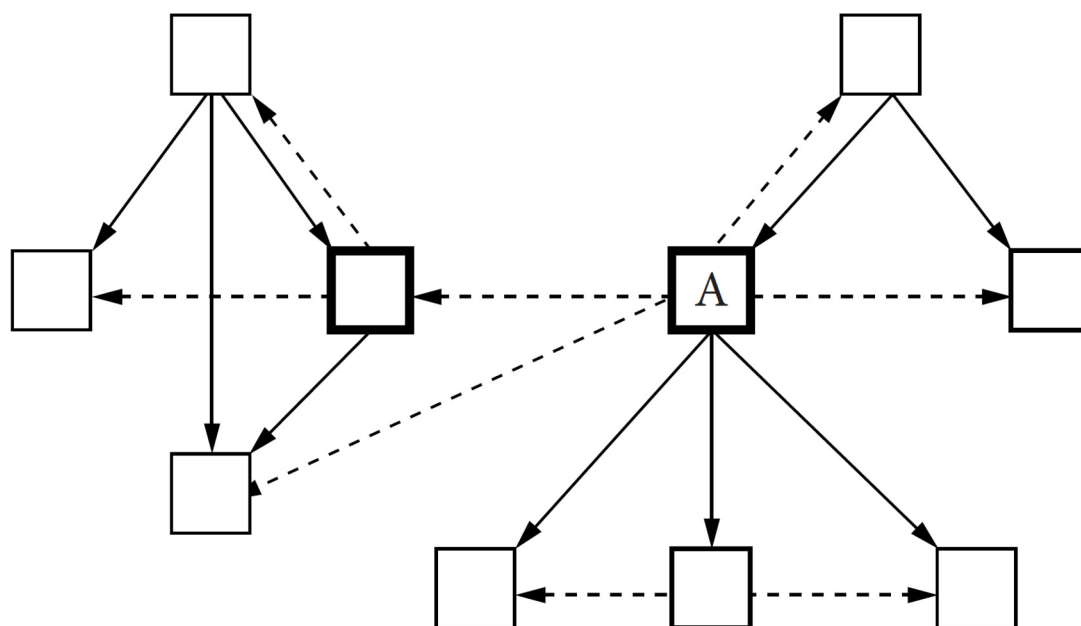


Figure 1.2 Visualization of a constructional network according to Langacker (2008: 226)

For the present study only inheritance links are relevant, which constitute “a central part of the constructional network in many versions of construction grammar” (Traugott and Trousdale 2013: 61). In essence, inheritance links indicate “taxonomic constraints”, illustrating how the nodes of a meso-constructional network are connected. Thus, “[t]he inheritance network lets us capture generalizations across constructions” (Goldberg 1995: 67, as cited by Traugott and Trousdale 2013: 61). Note that in the context of the present study, different line types in network visualizations do not indicate relational and inheritance links. Instead, different line types indicate inheritance links to nodes in the CC network that draw from different meso-construction types, a concept that will be explained in greater detail in chapter 6.

Entrenchment is one of a number of so-called domain-general cognitive processes²⁴ that affect language acquisition and production. Entrenched constructions are stored in a “network of constructions” (Goldberg 2003: 219; Traugott and Trousdale 2013: 45) that is also referred to as a “mental constructional network” (Hoffmann 2017b: 349; cf. also Croft and Cruse 2004; Goldberg 2006). But how does entrenchment manifest itself in actual language, and how can it be determined? As will be discussed in chapter 2, corpus data plays an important role in usage-based CxG investigations. Theories such as Hawkins’ Performance-Grammar Correspondence Hypothesis (PGCH, 2004) predict that syntactic patterns in languages are conventionalized (i.e., entrenched) “in proportion to the degree of preference in performance, as evidenced by patterns of selection in corpora” (Hawkins 2004: 3, emphasis JH). Assuming that a meaningful syntactic pattern is entrenched as a construction if it “occurs with sufficient frequency” (Goldberg 2006: 5), corpus data becomes an indispensable tool for researchers to determine syntactic patterns, which, based on their frequency in corpora (more precisely,

²⁴ Other domain-general process not discussed at length here include analogy, prototype-based gradient categorization, chunking, embodiment, preemption, and schematization; for an overview, see, e.g., Evans and Green (2006), Geeraerts and Cuyckens (2010), Dąbrowska and Divjak (2015), Dancygier (2017).

token and type frequency), provide evidence of the entrenchment of constructions, revealing nodes in the mental network. Previous investigations (e.g. Hoffmann et al. 2019; 2020), for example, were able to prove the existence of cross-clausal associations (see above) regarding the obligatory and optional slots in C1 and C2, thereby shedding light on the meso-constructural network of the English CC.

Another domain-general process that affects language is iconicity, i.e., the “(partial) motivation of a construction’s form by its meaning” (Hoffmann 2019: 12; cf. also Givón 1985; Haiman 1994; Bybee 2012: 529). This is particularly relevant in the context of the present investigation, because CCs are constructions that carry two distinct meanings²⁵, as discussed above: (1) a conditional asymmetric cause-effect relationship between C1 and C2, and (2) symmetric parallel change over time. The principle of iconicity therefore predicts a competition between symmetric and asymmetric forms, for which there is both diachronic and synchronic evidence. For example, Hoffmann (2017b, 2019) has shown the effects of iconicity on the English CC network over time: In Old English, which was considerably more synthetic than Present-day English, CCs were encoded asymmetrically using hypotaxis (Hoffmann 2017b: 358), emphasizing the asymmetric protasis-apodosis relationship between C1 and C2. However as the language became more analytic, CCs developed into increasingly parallel structures that reflect the symmetric clause-internal semantics of C1 and C2 (Hoffmann 2017b). Synchronic evidence of how iconicity and the competition between asymmetric and symmetric semantics influence the form of PdE CCs comes from a cross-linguistic comparison, as a glance at Table 1.1 reveals. It shows that while in some languages, symmetric forms prevail, such as in English or French (in which C1 and C2 can even be joined by the optional coordinating conjunction *et* ‘and’), CCs are encoded asymmetrically in other languages. Slovak and Spanish, for example, employ different clause-initial elements (*čím*_{C1}... *tým*_{C2}... and *cuanto*_{C1}... *tanto*_{C2}..., respectively), and German relies on hypotaxis²⁶, such that C1 is clearly marked as a subordinate clause, evident from the V-final constituent order in that clause.

Usage-based CxG thus constitutes a theoretical framework that is highly suitable for accommodating non-compositional constructions that consist of components that may be

25 While Culicover and Jackendoff appear to recognize the principle of iconicity, noting that “syntactic structures may reflect to a greater or lesser degree the semantic structures they express” (1999: 568), they disregard the symmetric semantics of the CC. Instead, they maintain that “the CC construction is an example of a syntax-semantics mismatch” (1999: 549) that is “coordinate in syntax but subordinating in semantics” (1999: 566). However, taking into account the symmetric semantics discussed here, the ‘mismatch’ problem is easily resolved – as will be argued, the formal features of CCs are actually characterized by a competition between asymmetric and symmetric phenomena (see also chapter 3).

26 A hypotactic relationship between C1 and C2 has been claimed to exist in other languages as well, but such claims are to be taken with a grain of salt. In Slovak, for example, the literature often refers to C1 as a subordinate clause and C2 as the corresponding main/matrix clause (e.g. Ivanová 2016: 153). This is based on the presumption that the clause-initial elements are pronominal elements that introduce either a subordinate clause (in Slovak, *čím*_{C1}) or main/matrix clause (in Slovak, *tým*_{C2}) (cf. Kesselová and Dolník 2010). However, unlike German (or Old English for that matter), where word order unambiguously marks C1 and C2 as subordinate and main/matrix clause, in Slovak with its free word order, this is a question of definition. Horsch has therefore advocated an approach that considers the clause-initial elements in Slovak as “construction-specific” elements (2019: 182) that merely *resemble* pronouns rather than being actual pronominal elements. Under this view, claims about a hypotactic relationship are difficult to maintain.

substantive and/or schematic to varying degrees (cf. Fillmore et al., who distinguish between “substantive [and] formal idioms” (1988: 505)), and for accounting for the complex semantics encoded by such constructions. In other words, usage-based CxG is an approach that is ideal for investigating CCs, which are syntactic patterns with rule-like behavior (i.e., fixed lexical material and open slots), instances of strongly lexicalized patterns (*The more, the merrier*), and construction-specific phenomena such as deletion/truncation and the ‘inverted’ C2C1 order.

But what about comparisons between English varieties? One of the central goals of the present investigation is testing Schneider’s Dynamic Model. That is, the analysis of CCs across different varieties of English (see section 1.3 below), and a comparison of their meso-constructional CC networks. Apart from treating constructions as a “basic unit of grammatical analysis” (Fried 2017: 243), they are also considered “viable descriptive and analytical tools for cross-linguistic comparisons” (Boas 2010: 15). They allow researchers to reveal **generalizations across languages** that are attributed to general cognitive constraints and the specific function a construction fulfills (Goldberg’s Tenet #5 (2003: 219)). Moreover, domain-general cognitive processes such as chunking and repetition (Bybee 2012) can lead to the entrenchment of **language-specific idiosyncrasies** that can also be captured by inheritance networks (Goldberg’s Tenet #6 (2003: 219)). From a usage-based perspective, such idiosyncrasies become entrenched due to repeated use in language (Croft 2013: 224), a point which will be discussed more extensively below. Finally, in CxG approaches, synchronic variation, evident from “small-scale variation and ‘gradience’” (Traugott and Trousdale 2013: 74-75), is assumed to indicate diachronic language change. Thus, variety-specific idiosyncrasies in CCs can be seen as evidence of language change, which is also an important component of Schneider’s Dynamic Model that is discussed in the next section.

1.3 World Englishes and the Dynamic Model

Today, most people have come to take the ubiquity of English for granted. Few are aware of the fact that the spread of English around the globe “has been and continues to be both rapid and unpredictable” (Mesthrie and Bhatt 2008: i), the result of what Schneider has called “[o]ne of the most remarkable [...] sociocultural changes of the modern period” (2007: 1). The status of English as the world’s most important language is undisputed: It is the language with the most speakers world-wide (Ethnologue 2019), an estimated 2 billion on all inhabited continents (Crystal 2008: 6), and it is “the language most widely taught as a foreign language – in over 100 countries” (Crystal 2003: 5). In fact, as early as the 1980s (cf. e.g. Kachru 1988) it was noted that second-language speakers clearly outnumber monolingual first-language speakers (Lange and Leuckert 2020: 3), by some estimations with a ratio of approximately three (Ostler 2005: 458) or even four to one (Crystal 2008: 6). Since the 1980s, the proportion of the world’s population that speaks English has grown from one fifth to one third (Crystal 2008: 5), making it a true “global lingua franca” (Crystal 2003: x), “the very language of globalisation” (Lange and Leuckert 2020: 9).

Indeed, English has become a language of international and global communication, of diplomacy, academia, business, travel, and countless institutions, including some without Anglophone members (e.g. ASEAN), and as Floris notes, it is “the most widely-learned and spoken second or foreign language in many countries” (2014: 215).

However, English is more than just *a* language. In schools around the globe, it has become common practice to distinguish between the ‘standard varieties’²⁷ American English (AmE) and British English (BrE), and to teach students the basic differences between these two standards, e.g. concerning pronunciation and vocabulary. Many are therefore aware of the fact that what is referred to as the ‘English language’ is not a monolithic entity. The generation of millennials that has been traveling the Anglophone world for the past two decades also knows that ‘English’ is more than just the American and the British varieties; the throngs of backpackers that swarm Australia, Canada, and New Zealand, and the continental Europeans that crowd the pubs in Dublin and Edinburgh are well aware of the existence of varieties beyond the American and British standards.

Nevertheless, only few (including many so-called ‘native’ speakers, for that matter) tend to appreciate the vast spectrum of English varieties around the world. From *Tok Pisin*, an English-based pidgin-turned-creole that is spoken in Papua New Guinea to the many (sub-)varieties of English spoken in South Africa, from Colloquial Singaporean English (‘Singlish’) to African American Vernacular English (AAVE), the English language boasts a multitude of offshoots, some with large speaker populations and others with smaller ones, and some with a history that goes back many centuries, as is the case with Indian English (IndE). ‘English’ can therefore only be considered a rather vague umbrella term for what Hoffmann refers to as “a heterogeneous and linguistically fascinating group of first (L1), second (L2), pidgin and creole as well as foreign language varieties” (2011: 3). In fact, traditionally, English varieties have been divided into three²⁸ sub-groups: English as a Native Language (ENL), English as a Second Language (ESL), and English as a Foreign language (EFL) (Schneider 2003: 237).

In the academic literature there has been a proliferation of terms to account for the spectrum of English varieties. Usually the plural form ‘Englishes’²⁹ is employed to indicate that there is more than *the* English language. Some of the terms that are used in the literature are *World Englishes*, *indigenized varieties*, *Postcolonial Englishes (PCEs)*, *Postcolonial varieties*, *New Englishes*, *Global Englishes*, *contact varieties* and *second-language varieties*. These terms are “used almost interchangeably, with minimally varying connotations” (Schneider 2003: 234), but in the present study, in line with Lange and Leuckert (2020: 29), the following terminology will be used:

- **World Englishes** as the most inclusive term to refer to all Englishes (i.e., encompassing all of the circles in Kachru’s model discussed below). The term was introduced by Kachru (1992) and reflects the growing interest in world-wide English

27 Note that the term ‘variety’ is used in linguistics to refer to many different concepts, e.g. language, dialect, sociolect, idiolect, or accent (cf. Bauer 2002: 2-4). In line with Schneider, ‘variety’ is used here as a rather inclusive term to describe “any specific, complete type of a language with distinctive properties on the levels of vocabulary, pronunciation, and grammar” (2011: 245), and as a “neutral term [for] any kind of language – a dialect, accent, sociolect, style or register” (Trudgill 2003: 139-40), i.e., to refer, with as little (negative or positive) connotation as possible, to any variation of English that is perceived as a distinct entity by its speakers.

28 Additionally, the term English as a Lingua Franca (ELF) has been suggested for varieties that are spoken by “people who do not share a mother tongue [and] use English as a resource for effective communication” (Lange and Leuckert 2020: 3).

29 As is customary in the literature, the plural form *Englishes* is used as an “unmarked term” to refer to ‘varieties of English’ (Schneider 2003: 234)

varieties since the 1980s (for an overview of relevant literature, see Schneider 2003: 234);

- **New Englishes**³⁰ to refer to second-language varieties excluding Pidgins and Creoles, separating “varieties of English in [...] monolingual countries from those in multilingual countries” (Lange and Leuckert 2020: 24). Note that these varieties have an “in-built expiry date” (Schneider 2003: 235) as they eventually develop into ‘standard varieties’ (a term that is further discussed below);
- **Postcolonial Englishes (PCEs)** to include first- and second-language varieties of English, excluding British English (BrE). Here, the emphasis is on the fact that these varieties are, in Schneider’s words, “products of a specific evolutionary process tied directly to their colonial and postcolonial history” (2007: 3).

Table 1.3 illustrates, using examples, how this terminology is applied in the present study. While individual varieties of English were studied as early as the nineteenth century (as noted by Mesthrie and Bhatt 2008: xi), the comparative study of World Englishes only really caught on from the early 1980s with the onset of the “World Englishes turn”, since then having “become an established subfield of linguistics” (Bolton 2020: 743; see also Schneider 2020: 17). As a result, there has been a “proliferation of theoretical models” (Hundt 2021: 298) that attempt to “categorize these dialects and to highlight similarities of properties or evolutionary processes between them” (Schneider 2020: 17, referring to Buschfeld and Schneider 2017) – in other words, to systematically categorize and classify English varieties, with the aim of “making sense of their structural properties” (Hundt 2021: 298). In the following, three of the more influential theoretical models of World Englishes will be presented, with the aim of not only showing how multifaceted the scope of World Englishes and its study is today, but also how awareness of and interest in this group of varieties has grown over the last three or so decades.

Table 1.3 Examples of terminology used in the present study

Term	Examples
World Englishes	British English, American English, South African English, Singapore English, Kenyan English, <i>Tok Pisin</i>
New Englishes	South African English, Singapore English, Kenyan English
Postcolonial Englishes (PCEs)	American English, South African English, Singapore English, Kenyan English, <i>Tok Pisin</i>

McArthur’s model (1987) features a three-layered ‘wheel’ at whose hub he posited, somewhat vaguely, a variety called “World Standard English”; Mesthrie and Bhatt refer to this as “written international English” (2008: 27). McArthur’s model thus belongs to the so-called “common core models” because it assumes the existence of core features of grammar that are “shared across all [World Englishes]” (Hundt 2021: 300). The common core is usually assumed to manifest itself in the grammar: Mair, for example, claims that “accent divides and grammar unites” (2008: 156). The layer around the hub contains regional and emerging standards, and the outermost layer includes localized varieties as offshoots from the regional and emerging standards (Figure 1.3).

³⁰ According to Schneider, ‘New’ refers to the emancipation of these Englishes towards “newly recognized and self-contained” (2003: 234-35).

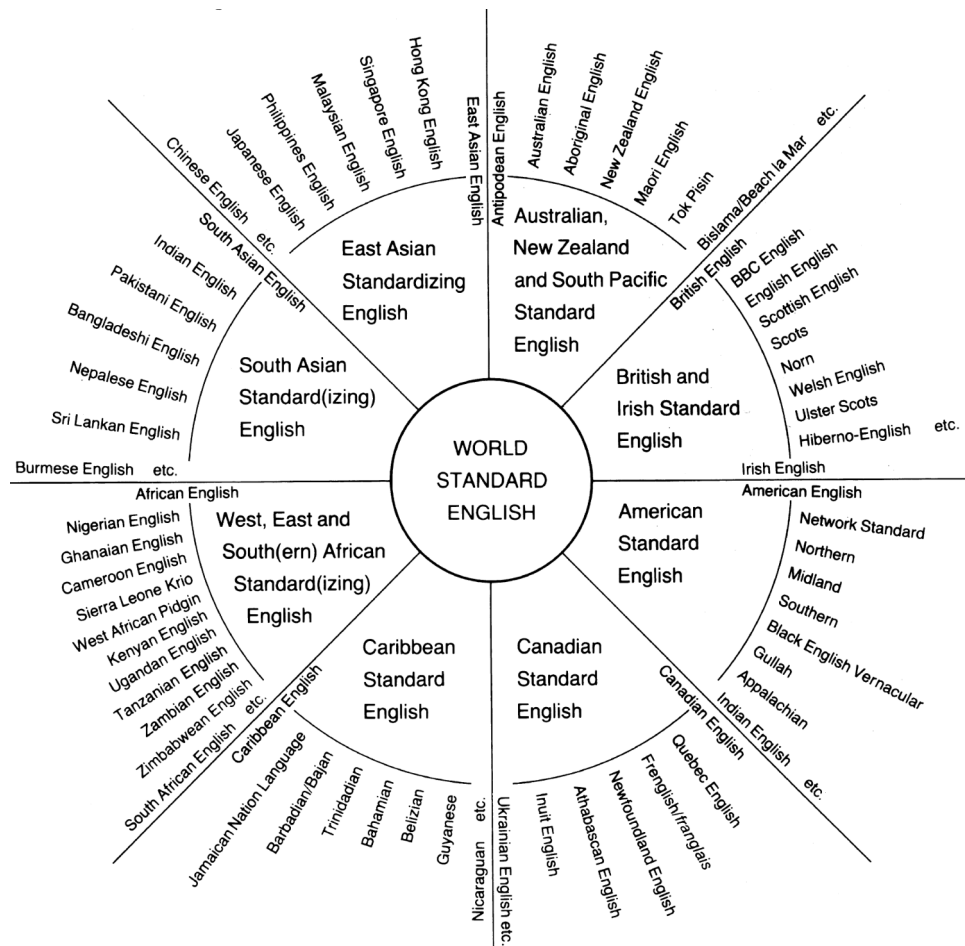


Figure 1.3 McArthur's wheel model (1987)

While McArthur's model³¹ does well in accounting for geographic realities and certainly provides a good first impression of the great variety of World Englishes, it has been criticized for three main reasons³² (cf. Mesthrie and Bhatt 2008: 27): (1) The second layer contains three fundamentally different types of English, namely, English as a first ('native') language (ENL), English as a second language (ESL), and English as a foreign language (EFL); (2) despite being located in the second layer, many varieties can hardly be considered as having standardizing forms (as suggested by the terminology of the model); and (3) some varieties of English are missing altogether, such as the so-called Euro-English(es) that have been claimed to emerge in continental Europe³³ (cf. e.g. Trudgill 2000; Hilgendorf 2020).

31 A similar model ("Circle of International English") was posited by Görlach (1990). However, it hardly differs from McArthur's – Mesthrie and Bhatt call them "reasonably similar" (2008: 28) – so it will not be discussed at greater length here.

32 Mesthrie and Bhatt also mention that McArthur's model does not account for the fact that pidgins and creoles "do not belong unambiguously to one family, [having] overlapping multiple memberships" (2008: 28). For the present study, however, this point of criticism is not as important as the other three, as it is not concerned with pidgin or creole varieties.

33 Although the status of Euro-English(es) as an independent variety is disputed, cf. e.g. Mollin, who notes that while "there are some indications that [English in] Europe is in the progress of transcending mere EFL status", it is more likely that "Euro-English is no variety as has been believed, but rather [...] English spoken by European learners" (2006: 197).

Most importantly, however, the ‘wheel’ geometry with a hub at the center from which the various spokes protrude suggests (probably inadvertently) that there is some sort of ‘high language’ standard with (more) normative/prescriptive power, into which some might also read higher prestige and value. A departure from the ‘wheel’ geometry was marked by Kachru’s model (Figure 1.4), which does away with the idea of a central ‘hub variety’, instead positing three concentric circles: An “Inner Circle”, an “Outer Circle”, and an “Expanding³⁴ Circle”, which largely correspond to ENL, ESL, and EFL varieties, respectively (as noted by Schneider (2003: 237)).

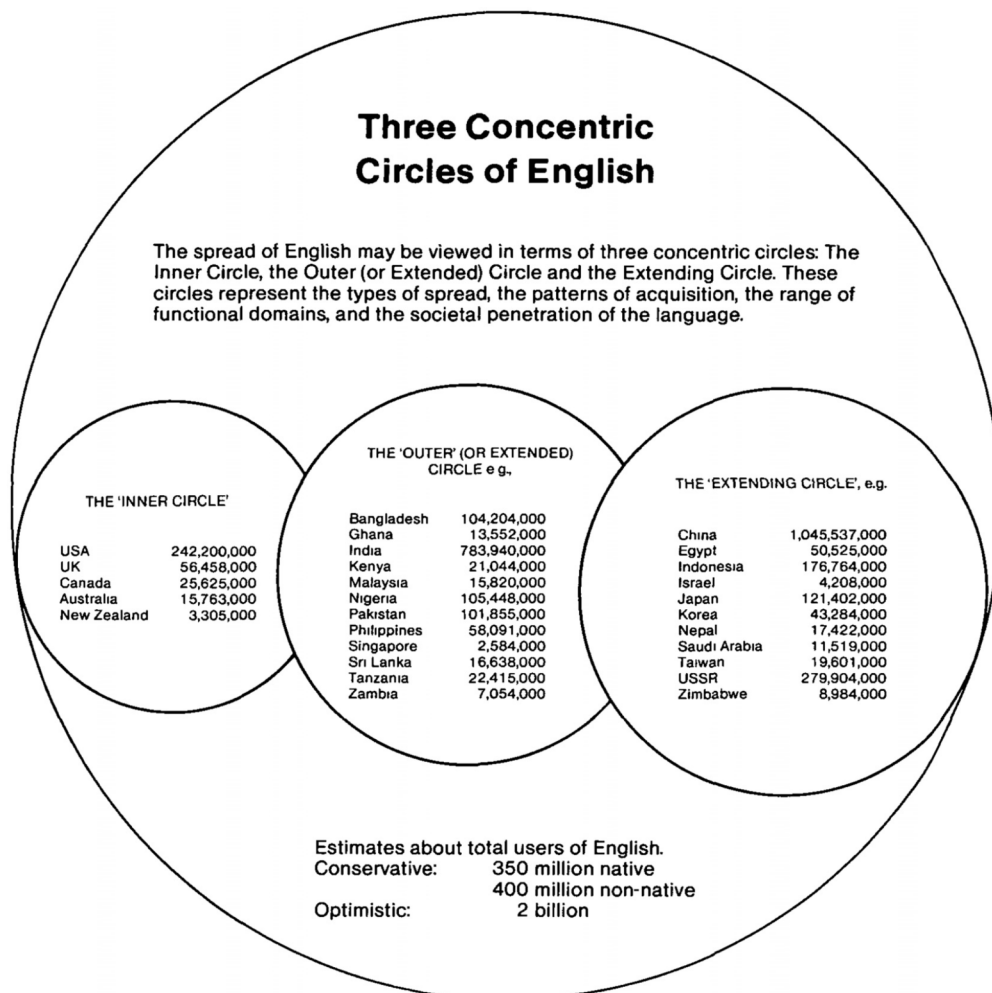


Figure 1.4 Kachru's Three Concentric Circles model (from Mesthrie 2008a: 30)

This model, which has been claimed to have “the best ‘fit’ for English” (Mesthrie 2008a: 30), has become extremely influential in the field of English linguistics. Its advantages over McArthur’s model are obvious from its geometry. On the one hand, it discards the notion of a more (or most) prestigious variety that lies at the center; in fact, Kachru “insisted that Outer Circle countries are norm-developing and fully capable of setting their own standards” (Lange and Leuckert 2020: 22). On the other hand, Kachru’s model also better represents speaker

34 Kachru originally called this the “Extending Circle”, as is evident from Figure 1.4.

proportions, showing that the speakers of ENL varieties are in fact considerably outnumbered by those who speak ESL and EFL varieties. Note that Kachru's model is not based on geography, as was McArthur's (and Görlach's, for that matter).

Rather, the Concentric Circles Model takes into account the historical and political background of each variety, resulting in more logical categories. For example, Japanese English, Kenyan English, and Australian English, which are in the same layer (but obviously fundamentally differ from each other) in McArthur's model fall into three separate categories in Kachru's model. Finally, the overlapping circles suggest that the boundaries between each group of varieties are not clear-cut, implying that varieties may blend into each other and even move from one category to another. With its geometry, Kachru's model emphasized, in the words of Schneider, "that the most vigorous expansions and developments can be observed in Outer and Expanding Circle" (Schneider 2003: 237), representing a development away from previous static models. The Concentric Circles Model, however, still had a major shortcoming: As noted by Mesthrie and Bhatt, social and ethnic varieties within the Inner Circle (e.g. AAVE) were left unaccounted for (2008: 30).

This is where Schneider's Dynamic Model (2003, 2007) comes into play, which is based on and expands on the earlier models outlined above – "the outcome of long and careful deliberation" (Hundt 2021: 298), marking "a diachronic and evolutionary turn [...] in World Englishes theorizing (Schneider 2020: 20, referring to Seoane and Suárez-Gómez 2016: 4). In Schneider's words, the models discussed thus far had the disadvantage of being based on "complex realities" and "fail[ing] to reflect the vigorous spread of English and changes of its status" (2011: 31). The Dynamic Model, in contrast, is a true sociolinguistic model in that it departs from a purely geographical and historico-political categorization/classification and takes into account sociological aspects, i.e., it incorporates identity theory and contact theory – in Schneider's words, "types of contact between social groups" (2003: 241). Schneider's model also accounts for diachronic change (the general development from EFL to ESL to ENL) and posits in this regard that World Englishes were and are being formed by a "fundamentally uniform developmental process, shaped by consistent sociolinguistic and language-contact conditions" (Schneider 2007: 5) in which both the colonizers (the "STL strand") and the indigenous population (the "IDG strand") play an important role (Schneider 2003: 234). With its sociolinguistic aspect the DM, which takes into account contact situations, appears to be much better at accounting for variation in World Englishes than models based exclusively on geography, as typological studies have confirmed: Kortmann finds that "typological profiles are far better explained in terms of whether we are looking at L1 varieties of English, L2 varieties, or English-based Pidgins and Creoles", and notes that "geography is clearly only of secondary importance to variety type" (2014: 166).

Most importantly for the present investigation, Schneider claims that "synchronically observable differences between [...] varieties may be regarded as consecutive stages in a diachronic process" (2003: 235). The Dynamic Model thus goes beyond merely categorizing World Englishes and examining them "in isolation, independently of each other, as unique cases shaped by idiosyncratic historical conditions and contact situations" (Schneider 2007: 4); it is a truly holistic model (i.e., it includes ENL, ESL, and EFL varieties) and posits that in the process of English being transferred to locations around the world in the context of British (and, to a limited degree, also American) colonization, the respective varieties went (and still go) through distinct evolutionary stages "characterized by a significant set of common traits"

in a process a process “determined by general sociolinguistic principles” (Schneider 2003: 234).

The Dynamic Model is thus one that not only descriptively “account[s] for the historical development of different Englishes [...] from a sociolinguistic [...] angle”, but also considers “factors and processes of new variety formation” (Hundt 2021: 299). In other words, this is a model with predictive power based on concrete linguistic characteristics, unlike the geographic or historico-political characteristics that the categories of the earlier models were based on. As a consequence, the Dynamic Model has prompted “a flurry of research [...] combining World Englishes with a corpus-linguistic perspective” (Lange and Leuckert 2020: 25). Concretely, the Dynamic Model posits that English varieties “go through a cyclic series of characteristic phases” (Schneider 2007: 5). These five evolutionary stages are briefly summarized in the following (based on Schneider 2003).

Stage I: Foundation

At the first stage, English arrives with settlers, and is thus transplanted to a territory where the language has not been spoken yet, becoming a sort of *lingua franca*. Contact between the STL and IDG strands is limited, and there is hardly any linguistic innovation. Phenomena that are characteristic of stage I are koinéization, toponymic borrowing, and very marginal bilingualism (with respect to the indigenous population).

Stage II: Exonormative Stabilization

In this stage, the territory experiences political stabilization under a foreign power (usually the British Empire), and the linguistic standard is an external norm. The STL strand is in the process of adapting to the new territory, but in terms of identity, it sees itself firmly rooted in the home country. There are cases of cultural lexical borrowing, and an expanding bilingualism can be observed, usually caused by the introduction of formal education in English.

Stage III: Nativization

At this stage, the colonized territory strives for and eventually gains political independence from the former colonial rulers. In other words, the STL strand has accepted the colonized territory as ‘home’. There is considerable interaction between the STL and IDG strands, who begin to adapt to each other linguistically. Accordingly, stage III is characterized by insecurity about external and internal norms of the language, and a gradual acceptance of localized forms, which eventually also enter formal contexts. At this point, the localized variety relies heavily on lexical borrowing. The term ‘structural nativization’ is of particular importance: It describes how localized preferences become habits and then rules, a process that has been described as “large-scale linguistic effects” (Brunner and Hoffmann 2020: 3). This affects not only pronunciation, but all parts of the lexis-syntax cline (e.g. prepositions, verb complementation, and idioms).

Stage IV: Endonormative Stabilization

In the aftermath of political independence, the population becomes increasingly aware of local linguistic peculiarities (as opposed to the exonormative norms of the colonizers). The localized variety usually carries positive connotation and functions as a carrier of identity. The widespread acceptance of local norms, which are now “accepted as adequate also in formal usage” (Schneider 2003: 250), is reflected by codification of the variety, for example in

dictionaries, grammars, and usage guides (hence the term ‘endonormative’). Codification also results in an increasing emphasis on the homogeneity of the new indigenous norm.

Stage V: Differentiation

In the final stage, the former colony has become not only independent but also self-reliant in all domains (e.g. politically, culturally, economically). The homogeneity of the variety is slowly supplanted by regional and social idiolects, and there is a progressive awareness among the populace concerning internal differentiating markers. Typically, this stage includes what is commonly described as ‘standard varieties’, i.e., AmE, but also varieties such as Australian English (AuE) and New Zealand English (NZE)³⁵.

In addition to these five developmental stages, the Dynamic Model assumes that in each stage, the same four extra-linguistic factors that are in a “causal relationship” (Buschfeld et al. 2014: 6) drive the evolution of a variety, as visualized in Figure 1.5:

- **political history** leads to
- **identity re-writings of STL and IDG groups**, which lead to
- **sociolinguistic language contact situations** and changing attitudes toward language(s), which lead to
- **linguistic evolution and structural changes** (Schneider 2011: 33-35)

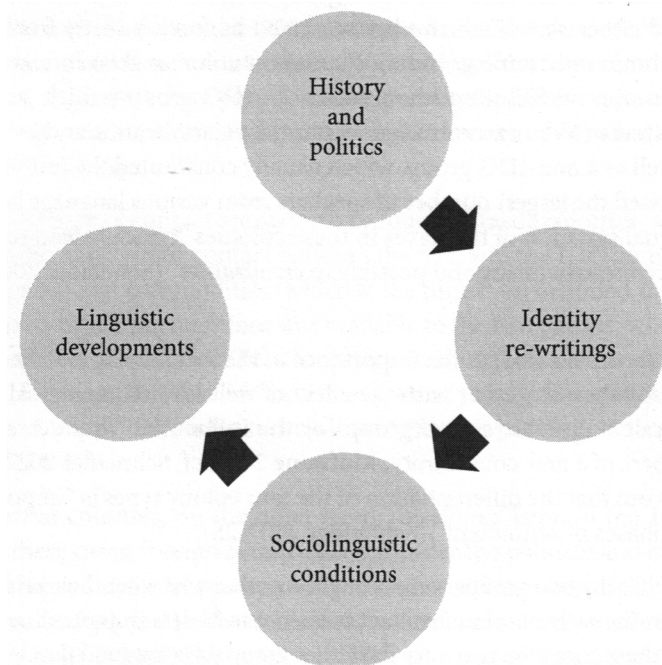


Figure 1.5 Extra-linguistic factors driving the evolution of Englishes (from Buschfeld et al. 2014: 6)

35 Note the notion of ‘standard’ English has shifted from the idea of a prescriptive ‘high language’ towards the concept of a variety that is simply “associated with situations and speakers more laden with official and public prestige” (Schneider 2011: 16). Therefore, when there is reference to ‘standard varieties’ in the following, this is not to be taken in any prescriptive and evaluative way. Just as the term ‘variety’ is used in a neutral manner, ‘standard English’ is used to refer to varieties that are “not inherently superior to or ‘better’ than any [...] dialect” (Schneider 2011: 16).

Figure 1.6 illustrates how in each DM stage, these four factors are at work and influence the evolution of PCEs. The Dynamic Model, as a reinterpretation and improvement of earlier models, thus makes it possible to analyze a given variety of English with regard to its linguistic characteristics and place it on an evolutionary cline that consists of five stages (often also referred to as ‘phases’ in the literature). One important aspect to note here is that the Dynamic Model is to be regarded as “abstract and prototypical” (Schneider 2003: 254), hence the ‘checklist’ of linguistic characteristics it posits need not fully apply to a given stage; Schneider even concedes that there may be “traces of two or more subsequent [stages] at a time” (2003: 254). However, in general it can be expected that in most cases, a majority of the conditions will be met.

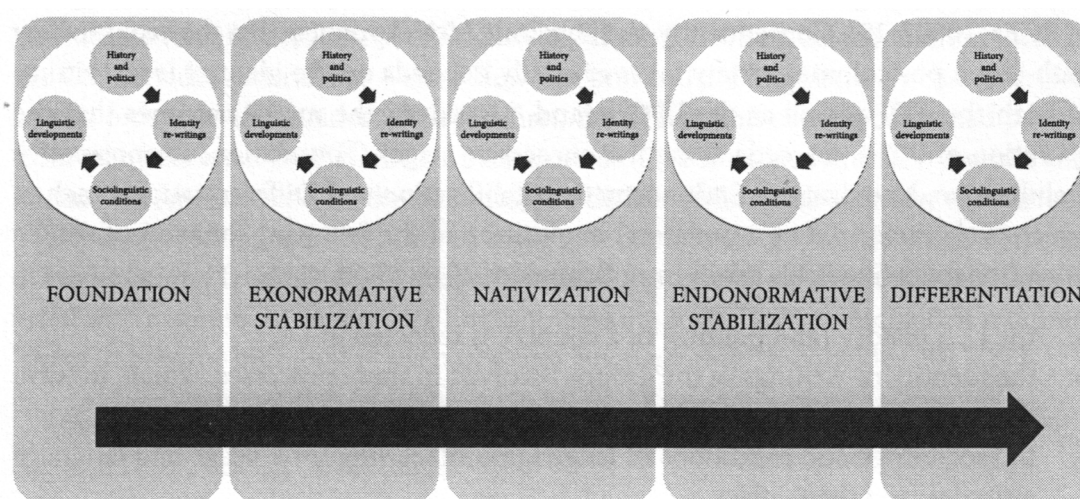


Figure 1.6 The five stages of the DM, with four extra-linguistic factors at work in each stage (from Buschfeld et al. 2014: 6)

The DM enables researchers to subsume which stage a given variety is in based on the linguistic characteristics it exhibits. What is most relevant in this respect is the assumption that the evolution of World Englishes proceeds “along the lexis-syntax cline” (Hoffmann 2019: 188), that is, from lexical items (e.g. toponymic borrowing) in stage I to complex syntactic rules in later stages whereby the first structural innovations can be found “at the interface between lexis and grammar” (Schneider 2007: 83), i.e., morphosyntactic variation, and this happens in stage III. In fact, it is stage III (*Nativization*) where there is an “increased amount of interaction [that] produces the emergence of structures distinctive to the newly evolving variety” (Schneider 2014: 11). Schneider therefore describes stage III of the DM as “the core component and the most interesting parameter of the [DM]” (2007: 71), and as “the central phase during which [...] linguistic transformations take place” (2014: 11). Table 1.4 (based on Brunner and Hoffmann 2020: 3) shows which varieties will be investigated in this study, and to which Dynamic Model stage they can be assigned³⁶.

³⁶ British English is not included in Table 1.4, as it has not evolved according to the DM.

Table 1.4 Investigated varieties, classified according to the Dynamic Model

Stage II Exonormative stabilization	Stage III Nativization	Stage IV Endonormative stabilization	Stage V Differentiation
Bangladeshi English Pakistani English	Philippine English Malaysian English Indian English Kenyan English Tanzanian English Nigerian English Hong Kong English Sri Lanka English Ghana English	Singapore English Jamaican English South African English ³⁷	American English Australian English New Zealand English Canadian English Irish English

1.4 Comparative Correlatives and the Dynamic Model

It is at the lexis-grammar interface where the Comparative Correlative construction, with its combination of phonologically/lexically fixed elements and slots of varying degrees of schematicity, is located, making it an ideal object for a constructionist investigation. Semantically, CCs are non-compositional in that their overall meaning cannot be deduced from the meaning of the individual parts they consist of (e.g. the clause-initial elements that look like definite articles but are clearly construction-specific, see section 1.2), and formally, they “straddle the lexicon-syntax cline” (Hoffmann 2019: 186).

Now, a central claim of the Dynamic Model is the prediction that in stage III, new variety-specific morphosyntactic patterns arise (Schneider 2007: 83). Mukherjee and Gries, for example, investigated verb complementation patterns in HKE, IndE and SingE, and concluded that there was a correlation with DM stages such that “the more advanced a New English variety is in its evolution, the more dissimilar it is to British English at the level of collostructions” (2009: 48-9, as noted by Schneider 2014: 14). Regarding CCs, it can therefore be expected that stage III varieties deviate from the reference variety BrE, and more so than varieties at other stages (i.e., IV and V) of the DM cycle. Previous research has confirmed this: In his CC study based on the ICE corpus family, Hoffmann found “quantitative adjustments to constructional networks” in various PCEs, concluding that stage III varieties rely more on meso-constructions while stage V varieties “make greater use of a macro-construction” (Hoffmann 2019: 225), and confirming earlier claims that DM stages correlate with constructional productivity (Hoffmann 2011; 2014b). Concretely, Hoffmann found a tendency towards a higher proportion of significant meso-constructions in stage III

37 In the context of the corpus study (see chapter 4), South African English (SAfE) was grouped with stage IV varieties, following a general tendency in the literature: cf. e.g. Schneider’s observation that “SAfE has made deep inroads into phase 4” (2007: 188; cf. also the discussion in chapter 5). It is acknowledged, however, that “it is not justified to talk of a single, stabilized variety” (Schneider 2007: 188). Unfortunately, the GloWbE metadata did not allow identification of the (sub)types of SAfE, so that it was not possible to disentangle the South African varieties in the corpus study. The MET experiments (see chapter 5), however, did gather data about the ethnic background of the South African participants, so that a more fine-grained analysis could be carried out, with Black SAfE and Coloured SAfE treated as stage IV varieties and White SAfE treated as a stage V variety (more detailed discussion in chapter 5).

varieties, that is, these varieties appear to have a more pronounced preference for significantly associated cross-clausal patterns such as the ones discussed in section 1.1 using examples (5) to (9). Interestingly, such claims have recently received further support from a corpus investigation on the *way*-construction, which found that “the overall frequency of the [way-]construction as well as the productivity of the verbal, nominal, and prepositional slots of the construction correlate positively with a variety’s stage in the Dynamic Model” (Brunner and Hoffmann 2020: 1), such that varieties in lower stages exhibited a “stronger [...] tendency to select specific prototypical, or frequent, fillers in the constructional slots” (Brunner and Hoffmann 2020: 1).

In addition to quantitative variation, Hoffmann also provides several examples of “qualitative constructional change” (2019: 226) concerning the CC construction across DM stages, e.g. different clause-initial elements in C1 (1.26) (2019: 228) and C2 (1.27) (2019: 229), as well as “periphrastic comparative form[s] [...] where Standard English would normally have a synthetic, non-periphrastic form” (1.28) (2019: 230):

(1.26) [*as the more he thought*]_{C1} [*the more confused he gets*]_{C2}
(ICE-NG: W1A-50)

(1.27) [*the longer you delay*]_{C1} [*then the less unfortunate it will be for Singapore*]_{C2}
(ICE-SIN: S1B-025)

(1.28) [*as the more it gets to the public*]_{C1} [*the more clear the issue becomes*]_{C2}
(ICE-PHI: S1B-034)

Additionally, the phonologically fixed clause-initial element *the* can sometimes be omitted altogether, as example (1.29) from Hong Kong English (HKE) shows:

(1.29) *Keep in mind the general rules that*
[*__ further out you go*]_{C1} [*the more space you will get.*]_{C2}
(GLOWBE-HK wlp_hk_wjj/wlp_hk_b01 blog ##206010 Line: 20)

In the context of the Dynamic Model, such qualitative changes are interesting because they “show innovations that depart more significantly” (Hoffmann 2019: 227) from the standard varieties than the quantitative tendencies discussed above. From a usage-based perspective, these phenomena illustrate the competition between asymmetric and symmetric semantics in the context of iconicity (as discussed in section 1.1), in this case not across languages, but rather across varieties of the *same* language. Assuming a usage-based approach, these quantitative and qualitative variety-specific idiosyncrasies are ‘measurable’ in a sense that their token/type frequencies can be obtained from corpus data, reflecting entrenchment due to increased use (Croft 2013: 224).

In addition to putting the Dynamic Model to test, examining CCs across varieties of English can also contribute to help “disentangle variety-specific from general linguistic phenomena” (Hoffmann 2019: 186) and contribute to the “aspirations toward universal applicability” of CxG (Fried 2017: 249). On the one hand, in line with Goldberg’s Tenets, it should be possible to capture variety-specific idiosyncrasies with inheritance networks (Tenet #6). On the other hand, in line with Tenet #5, it should be possible to explain generalizations with “general, cognitive factors that affect the shape of the construction” (Hoffmann 2019: 186). In this respect, previous studies have provided plausible evidence, for example, a statistically significant “preference of [iconic] C1C2 over C2C1 CCs” across all varieties and a “strong tendency for paratactic marking of C1 and C2” (Hoffmann 2019: 231).

In any case, research in this context is certainly warranted, as studies investigating quantitative CC phenomena have so far concentrated exclusively on the standard varieties (Hoffmann et al. 2019; 2020) while qualitative innovations across English varieties have so far only been subjected to small-scale corpus investigations – Hoffmann concedes that his ICE corpus data contained such tokens only with a “low frequency”, calling for “[m]ore research” on such innovative structures (2019: 229), expressing the necessity of taking “a much closer look at [...] qualitative meso-constructive innovations during the nativization stage [stage III] using larger corpora and experimental approaches” (2019: 231). On top of that (and as discussed in section 1.1), so far there has been no comparative investigation on CCs that combines the analysis of corpus data with introspective acceptability experiments, a methodology that has previously proven itself (Hoffmann 2011).

Apart from Dynamic Model stage-specific phenomena, in terms of qualitative variation in CCs it can also be expected that linguistic creativity does not manifest itself in the same way in every variety. Due to the influence of different substrate and adstrate languages (i.e., different input situations), it is likely that innovation in, say, Singapore English takes a different form than in Kenyan English. Hoffmann notes in this respect that “more complex input situations can be expected to affect speakers’ mental representations of the CC constructions” (2019: 186).

As noted by Kortmann (2014: 167), in this context Mesthrie (2006; 2008a; 2012) has repeatedly claimed that there are two types of New Englishes regarding morphosyntax: the ‘preserving’ type as exemplified by Black South African English (Black SAfE), and the ‘deleting’ type, of which Singapore English is purportedly a prime example. In fact, Mesthrie and Bhatt have claimed the existence of a general dichotomy in World Englishes regarding these two types (2008: 90-92; as noted by Kortmann 2014: 176). The deleting type, claimed to be typical of South East Asian varieties (due to the influence of the Chinese substrate), tends to delete elements that would be realized in the standard varieties, whereas the preserving type, typically African varieties, do not only prefer to realize or ‘restore’ elements that in MGG approaches would be rendered as empty nodes, but may even *insert* morphemes that would not be used in Standard English (as discussed by Kortmann 2014: 174); Mesthrie also refers to this phenomenon as “undeletions” (2008b: 494).

With regard to CCs, this assumption would mean that in South East Asian varieties, there should be a tendency towards ‘creatively’ deleting elements of the CC that would not be grammatically acceptable in Standard English varieties, while in African varieties, there should be a higher acceptance of elements that are optional, such as *that*-complementizers (see section 1.1) and perhaps even a tendency towards inserting elements that would not be acceptable in Standard English. And indeed, examples from corpora appear to confirm this notion. Note that in (1.29), an example from HKE, the C1 clause-initial element has been deleted, while in (1.26), a token from the Nigerian component of the ICE corpus, an extra element (*as*) has been inserted before the clause-initial *the*. Such claims, however, are to be taken with a grain of salt. Kortmann, in an investigation based on data from the World Atlas of Varieties of English (WAVE), could not confirm “Mesthrie and Bhatt’s broad geographical claim” (2014: 176). Rather, he suggests a “continuum along the parameter ‘deletion vs. preservation of grammatical formatives’ on which varieties of English can be arranged” (2014: 176), ranging from Pidgins and Creoles as “deleters” to L1 varieties as “preservers” (2014: 176). Note that this also reflects Szmrecsányi et al.’s claim that there is an L2 (stage

III)/L1 (stages IV and V) “split between native and non-native varieties of English” (2016: 22). Thus, apart from “illustrating how studies in the Dynamic Model can profit from a constructionist perspective” (Hoffmann 2019: 232) and filling a gap in CxG-based research that has been described as “a striking absence of cross-linguistic generalizations” (Boas 2010: 2), a large-scale contrastive study of the CC across varieties of English can also contribute to resolving conflicting claims about general morphosyntactic characteristics of World Englishes.

1.5 Objectives and outline

As the wealth of sources cited in the previous sections has demonstrated, the various idiosyncrasies that CCs exhibit have resulted in plenty of interest and consequently prompted a considerable amount of studies over the decades, both introspective and corpus-based. Nevertheless, many questions remain unanswered, many studies lack evidence in the form of data, and many points of contention have not been conclusively resolved. Additionally, there are three large gaps in research that have been opened up by previous studies that will be the primary focus of this study.

First, while there have been previous CxG-based studies on CCs in English, none have been of the scope or the methodological approach of the present investigation. Hoffmann, working with the ICE corpus family, explored CCs in the context of Dynamic Model evolutionary stages (2014a,b; 2019), but only with rather small data sets (no more than 352 CC tokens across 12 varieties). The present study seeks to remedy this by relying on large-scale corpus data extracted from multi-million word corpora.

Second, while there are existing corpus investigations based on large data sets consisting of more than 1,000 tokens, none of these are comparative in nature, focusing only on data from the Standard English varieties American English (Hoffmann et al. 2019) and British English (Hoffmann et al. 2020). The present study will address this lack of a comparative dimension in large-scale studies by including data extracted from the GloWbE corpus, expanding the ‘comparative dimension’ to 20 varieties of English from stages II-V of the Dynamic Model.

Third, despite the many existing introspective and corpus studies on English CCs, none of their findings have so far been corroborated with introspective acceptability judgment experiments to include an L1 speakers’ perspective on certain phenomena. The present study will incorporate an experimental study with several hundred participants, selected from four varieties of English from stages III-V of Schneider’s Dynamic Model, thereby addressing (1) the ‘negative data problem’ that Hoffmann paraphrases as “just because a phenomenon cannot be found in a corpus, it cannot be concluded that it is ungrammatical”, as well as (2) the ‘performance problem’, in Hoffmann’s words, “just because a construction appears in a corpus it does not automatically follow that it is grammatical” (2011: 1).

The data thus obtained will not only shed light on the mental constructional network of English CCs and give us a general idea of how cognitive factors shape the construction in English, but also contribute to our knowledge of the many variety-specific idiosyncrasies (see sections 1.1 and 1.4) exhibited by CCs. Ultimately, the results of the present study will hopefully be able to not only fill gaps that have been opened by previous research, but furthermore be able contribute to our knowledge of the English construct-i-con and thus, provide another puzzle piece to complete the ‘world map of language’.

This study thus addresses the following **research questions**:

1. How can the abstract representation of the Comparative Correlative construction across English varieties be best described?
2. Which generalizations can we find across varieties, and how can they be accounted for by domain-general cognitive processes (cf. Goldberg's Tenet #5 (2003: 219))
3. Which variety-specific features (i.e., cross-clausal associations, slot productivity, prototypical fillers, asymmetric encoding, ratio of C2C1 order...) can we determine for each English variety? How do the constructional networks differ between the varieties with regard to these features?
4. Does the evolutionary state of English varieties (i.e., their stage in the Dynamic Model) correlate with the nature of their constructional networks regarding CCs?
5. Can a general dichotomy between 'deleting' and 'preserving' varieties be determined (Mesthrie and Bhatt 2008; Kortmann 2014), and if so, does it correlate with geographical claims (Mesthrie 2006; 2008a; 2012; Mesthrie and Bhatt 2008), or can Kortmann's claim of a linguistic continuum that ranges from L2 to L1 varieties be confirmed?

The **main hypotheses** are as follows:

- i. The best way to describe the English CC is by means of a meso-constructional network that accounts for cross-clausal associations;
- ii. Generalizations across varieties are best explained with cognitive principles. Thus, the principle of iconicity leads to a competition between asymmetric and symmetric forms, with a strong tendency towards symmetry due to British English influence. However, in stage III (and to some extent stage IV) varieties, there are innovative asymmetric tendencies. These variety-specific features can be explained with the respective local input situation, i.e., substrate and adstrate influence;
- iii. The overall frequency of CCs, as well as the productivity of slots and prototypical fillers correlate with DM stages (as determined by Brunner and Hoffmann (2020) for the *way-cxn*). Innovative forms (e.g. asymmetric clause-initial elements) are generally more likely to be found in stage III due to "innovation at the lexis-syntax interface" (Schneider 2007);
- iv. Kortmann's claim of a linguistic continuum (2014) is more plausible than Mesthrie's geographical claims, with the empirical data of the present study showing that a 'deleter' vs. 'preserver' dichotomy is unlikely to follow the Africa – South East Asia division.

To address the questions and issues discussed above, the present study is structured as follows: Chapter 2 will present the methodology according to which data was obtained, handled, and analyzed. This includes an explanation of how language and linguistic phenomena are examined with a usage-based Construction Grammar approach, an overview of the corpora that were queried and how data was extracted from them, an introduction to how the acceptability judgment experiments were designed and conducted, and how the data thus obtained was statistically analyzed. Chapter 3 will provide a detailed overview of the linguistic phenomena that are investigated in this study:

- **Hypotactic features** (3.1)
 - *that*-complementizers (3.1.1)
 - subject-auxiliary inversion (3.1.2)
 - object pronoun extraction (3.1.3)
- **Clause order** (3.2)
 - non-iconic C2C1 order (3.2.1)
 - ‘stacked’ C1C2C3 structures (3.2.2)
- **Cross-clausal associations** (3.3)
 - lexical fillers (3.3.1)
 - filler types (3.3.2)
 - BE-deletion and truncation (3.3.3)
 - filler type and deletion/truncation interactions (3.3.4)
- **Productivity of lexical filler slots** (3.4)
- **Prototypical fillers** (3.5)
- **Asymmetric encoding** (3.6)

Chapter 4 will then present the results of a large-scale corpus study based on COCA, BNC, and GloWbE data, and chapter 5 will present the results of the introspective experiments. Chapter 6 will discuss the findings from chapters 4 and 5 and the corresponding meso-constructional networks. A usage-based CxG account of English Comparative Correlatives will be advocated, showing how the results are best explained with a cognitive approach, showing that Boas’ view of constructions being “viable descriptive and analytical tools” (2010: 15) for cross-linguistic studies is also applicable to intra-linguistic variation. It will be argued that phenomena across varieties can be explained with general cognitive principles, and that variety-specific idiosyncrasies are the result of specific input situations, including adstrate and substrate languages. Finally, chapter 7 will offer a summary of the study.

2 Data and methodology

We lack thorough and more comprehensive empirical documentations and especially quantitative investigations and correlative studies of most of these [PCE] varieties.

Schneider (2011: 353)

Since the “World Englishes turn” (Bolton 2020: 743) in the 1980s, there has been an ever growing number of comparative studies in the context of World Englishes research. As noted by Hundt, this has resulted in the development of two “research strands”, the first of which has “led to a proliferation of theoretical models” and the second of which has resulted in “comparative research relying increasingly on sophisticated statistical modelling” of corpus data, especially in recent years with the “advent of ‘big data’” (2021: 298). While theoretical models such as the Dynamic Model strive to explain and predict linguistic variation, the second research strand – empirical studies – put to the test these theoretical models, with the aim of proving (or disproving, for that matter) their predictive power. However, these two strands are not always closely intertwined: Hundt speaks of the difficulty of “bring[ing] intricate, quantitative modelling of usage data to bear on theoretical modelling” (2021: 298).

Addressing this issue, the present study will bring two research strands together and test the predictive power of a widely known theoretical model of the development of World Englishes – Schneider’s Dynamic Model – by means of statistical analysis of corpus data that is complemented by psycho-linguistic experiments, a tried and tested procedure advocated *inter alia* by Hoffmann (2011), McEnery and Wilson (2001) Gries *et al.* (2005), Kepser and Reis (2005), Bresnan (2007), Gilquin and Gries (2009), and Szmrecsányi *et al.* (2016). A further goal is to contribute towards Construction Grammar’s “aspirations toward universal applicability” (Fried 2017: 249), demonstrating that the theory is able to accommodate intra-linguistic variation with regard to a complex construction such as the CC, i.e., syntactic variation across different varieties of the same language. Ultimately, by bringing together the Construction Grammar and World Englishes research strand, the present investigation also aims to show, in the words of Brunner and Hoffmann, how “World Englishes data support constructionist approaches to language, and, conversely, how World Englishes studies can benefit from a cognitive, constructionist analysis” (2020: 28).

This chapter that discusses the methodology of the present investigation will show how language is analyzed with a Usage-based Construction Grammar approach (section 2.1), and in particular how corpus studies (section 2.1.1) and magnitude estimation experiments¹ (METs) (section 2.1.2) contribute to linguistic research, including a discussion of the statistical methods that were used to analyze the corpus and experimental data². It will also be shown how the methodology used in this study can be applied in the context of World Englishes research (section 2.2), and provide information on the corpora that were used and how data was extracted from them and analyzed (section 2.3). Finally, there will be a brief

1 A detailed account of how the magnitude estimation experiments (METs) were designed and carried out, and how the obtained data was subsequently analyzed, will be provided in chapter 5.

2 Note that statistical analyses were employed to test the hypotheses outlined in section 1.5, making the approach of this study an inferential one (as opposed to a descriptive one, cf. McEnery *et al.* 2006: 53-54).

overview of the software that was used for handling, annotating, and analyzing the corpus and experimental data (section 2.4).

2.1 Analyzing language with a Usage-based Construction Grammar approach

As discussed in chapter 1, the present study relies on a two-pronged approach to investigating linguistic phenomena. Hoffmann refers to this principle as “corroborating evidence” (2011: 1, see also Hoffmann 2006; 2013b), alluding to the procedure associated with criminal investigations. In analogy, the goal for a linguist is to “convince a jury of their peers” (2011: 14). Accordingly, the methodology applied to the present investigation relies on two main sources of data to answer the research questions outlined in chapter 1.5: (1) Corpus data and (2) introspective acceptability judgments obtained from speakers of different English varieties, both of which are data sources that have previously been described as “valid ‘access paths’ to competence” (Hoffmann 2011: 11), and have been deemed “valid, reliable and objective” (Hoffmann 2011: 13). The combination of corpus data with experimental results is an approach that has been advocated for several decades. McEnery and Wilson, for example, note that already in the 1950s, it was “argued [...] that corpus-based grammars should be tested on non-corpus-based utterances to demonstrate their predictive power” (2001: 7).

In essence, the aim of the present study is to combine ‘the best of two worlds’ instead of relying on an ‘exclusive’ approach that restricts itself to the use of one approach and justifies it by pointing out the shortcomings of the other, as is often practiced (as noted by Hoffmann 2011: 11). While the advantage of corpora is that they provide ‘positive data’ that can be empirically analyzed (e.g. type and token frequency, and slot productivity), introspective data has the advantage that it can resolve questions about ‘negative data’, i.e., speakers can be asked to rate constructions that do not appear in corpora but nevertheless may be part of the language system, making for a “complementary nature of [...] validity of these different types of data” (cf. Hoffmann 2011: 10-11; cf. also Hoffmann 2013b: 100). In other words, while corpus data is well-suited to investigate phenomena with a high frequency, the experimental approach allows a better assessment of phenomena that are infrequent or do not appear in corpus data at all (but could or should be grammatical). The advantages of corroborating findings from corpus studies with experiments have been noted by e.g. McEnery and Wilson, who write of the advantages of a “complementary” approach that combines corpus investigations with data obtained from introspective experiments (2001: 16), and Bresnan, who mentions the importance of “convergent corpus and experimental methods” (2007: 91).

In the context of the research questions and hypotheses (see section 1.5), the phenomena to be explored were thus split between the two methods, corpus data analysis and introspection experiments, as follows:

- **Corpus study:** Hypotactic features (*that*-complementizers, subject-auxiliary inversion); clause order phenomena (non-iconic C2C1 and stacked C1C2C3); cross-clausal associations (with regard to lexical fillers, filler types, and deletion and truncation phenomena); slot productivity; prototypical fillers
- **Introspection experiments:** *that*-complementizers, object pronoun extraction, asymmetric encoding (i.e., different clause-initial elements)

The two methods will be elaborated on in the following.

2.1.1 Corpora and corpus studies

The basic assumption of usage-based approaches is that constructions are entrenched as a consequence of input frequency (see section 1.2). By “repetition or rehearsal, a complex structure is thoroughly mastered to the point that it is virtually automatic” and thus “undergoes progressive entrenchment and eventually becomes established as a unit” (Langacker 2008: 16). Evidence of input frequency can be found in the type and token frequency “with which a speaker hears and/or uses” the construction (Hoffmann 2019: 17). While there are many sources of data from which evidence of type and token frequency can be obtained, clearly the most common source in usage-based studies is corpus data³, as noted by Hoffmann (2019: 17). A corpus is, essentially, “a collection of pieces of language, selected and ordered according to explicit linguistic criteria in order to be used as a sample of the language” (Sinclair 1996: 27). Modern corpora such as the ones used in the present study are collections of “(1) *machine-readable* (2) *authentic* texts (including transcripts of spoken data) which is (3) *sampled* to be (4) *representative* of a particular language or language variety” (McEnery et al. 2006: 5, emphasis in source). This makes corpora more than just “haphazard collections of textual material” – rather, modern corpora are “assembled with particular purposes in mind” (Leech 1992: 116), that is, the scientific analysis of language.

Current usage-based studies rely on large (multi-million or even multi-billion-word) electronic corpora that have been annotated for parts-of-speech (POS) using automatic taggers such as the Constituent Likelihood Automatic Word-tagging System (CLAWS)⁴ that “choose a preferred tag for a word by calculating the most likely tag in the context of the word and its immediate neighbours” (Garside and Smith 1997: 102). POS tagging immensely facilitates corpus queries when retrieving complex syntactic patterns such as Comparative Correlatives. Using the British National Corpus tag set⁵, for example, one can compile a regular expression to search for strings containing the clause-initial element *the*, followed by a comparative adjective (AJC) or general adverb tag (AV0, since the tag set does not contain a separate tag for comparative adverbs), to search for CCs.

What must be noted here is that corpora are all but perfect concerning POS annotation (Lange and Leuckert 2020: 53). With regard to the British National Corpus (BNC), for example, it has been estimated that approximately 1.7% of all tags (without punctuation marks) are erroneous (Leech 2013). Furthermore, there are so-called ambiguity tags where “the automatic tagger was unable to decide, with sufficient likelihood of success, which was the correct category [...] and so left two possibilities for the users to disambiguate”; such ambiguity tags concern roughly 4.7% of the BNC data (Leech 2013). With corpus queries that return several thousand hits, as was the case in the present investigation, this means that there is a considerable amount of so-called false positives (i.e., irrelevant tokens) to be expected, as example (2.1) demonstrates:

(2.1) *In the narrower or the broader sense?*

(BNC W_fict_prose F9R)

3 An overview of usage-based studies based on corpus data is provided by Gries (2013: 97).

4 For detailed information about the CLAWS tagger and how it operates, the reader is referred to <http://www.natcorp.ox.ac.uk/docs/gramtag.html> and <http://ucrel.lancs.ac.uk/claws/> (accessed 24 Nov 2020)

5 The full BNC tag set is available at <http://www.natcorp.ox.ac.uk/docs/c5spec.html> (accessed 24 Nov 2020)

This token was extracted by Thomas Brunner's *R* script (see section 2.3.1.1), which searched for the following pattern: *the* + comparative adverb/adjective + *the* + comparative adverb/adjective. As example (2.1) shows, this also retrieved tokens that were not CCs and thus had to be manually discarded. Furthermore, with corpora that include data from the web, such as the GloWbE corpus that was used for the present study, there is the issue of so-called mirror sites, i.e., "websites which are replicated in domains other than their original domain", leading to a "great deal of duplication" (Nelson 2015: 39; cf. also Davies and Fuchs 2015a: 47). Consider, for example, the following CC (2.2) from GloWbE, which was retrieved in the context of a search for tokens featuring asymmetric encoding (see chapter 3 section 3.4):

(2.2) [*The stronger the evil,*]_{C1} [*then the more resolute, the stronger his goodness has to be.*]_{C2}

This particular token was found in both the American English component (GLOWBE-US ##671611) as well as the Sri Lankan component (GLOWBE-LK ##941068) of the Corpus of Global Web-based English.

Finally, there is the problem of deleted portions of text in the corpora that were used for the present investigation. Due to copyright, "[e]very 200 words, ten words are removed and are replaced with '@'" (<https://www.corpusdata.org/limitations.asp>, accessed 23 Nov 2020). While the author is aware of this limitation, it is also true that, as Hoffmann et al. point out, such corpora are "still an indispensable tool for mildly frequent structures such as the CC construction" (2019: 10). Furthermore, as stated on the corpora web site, "the 'relative frequency' of words, collocates and so on" is not significantly affected, since from a more general perspective, they occur randomly and as such, the omissions "without regard to context, affect all words equally the same" (<https://www.corpusdata.org/limitations.asp>, accessed 24 Nov 2020).

The implications of the issues outlined above are obvious: Before beginning with the analysis of the corpus data, it must be manually checked to discard false positives and amend erroneous or ambiguous tags where applicable (cf. Hoffmann 2019: 21; see also Lange and Leuckert 2020: 59). In the context of the present study, this task was carried out by six student assistants from the Catholic University of Eichstätt-Ingolstadt who, following the methodology of previous corpus studies (Hoffmann et al. 2019; Hoffmann et al. 2020), "received intensive training based on a sample data set and were provided with a detailed coding handbook" (Hoffmann et al. 2019: 10-11).

An important prerequisite for a valid statistical analysis of corpus data is that the corpus in question is representative and balanced (Gries 2008: 30). Representativeness refers to how well a corpus represents the entire variety under inspection, and it affects the extent to which the results of studies based on corpus data can be generalized to an entire language variety (Leech 1991: 27, see also Lange and Leuckert 2020: 47-8). Modern electronic corpora, including the ones used in the present investigation, are compiled with the goal of making them "maximally representative of the variety under examination" (McEnery and Wilson 2001: 30, cited in Hoffmann 2019: 17), i.e., they are "designed as representative samples of language use with the underlying assumption that corpus findings are characteristic of a prototypical average speaker of the language variety" (Mukherjee 2015: 35). To achieve representativeness, corpora should be balanced, i.e., compiled to include an adequate spectrum of genres, and sampled to include texts from various parts of the speaker population. This implies including texts from different genres and domains, as well as written and spoken

language (Kennedy 1998: 20). COCA and BNC, for example, contain texts from various registers, including spoken, fiction, magazines, news, and academic (Davies 2009: 161). However, it must be noted that any corpus, no matter how large, can never be more than a “finite-sized sample” (Hoffmann 2019: 17) of a language and thus cannot be considered to be “typically representative of the input [and] output of a particular individual” (Stefanowitsch and Flach 2017: 122). This is an important caveat to keep in mind, especially when investigating the mental network of the “fairly infrequent or mildly frequent” CC construction (Hoffmann 2019: 18).

Nevertheless, following Schmid’s “from corpus-to-cognition principle” (2000: 39, as discussed in Hoffmann et al. 2019: 10; Hoffmann 2019: 18), we can still deduce the entrenchment of constructions, and this in “two complementary ways” (Hoffmann 2019: 18): the “corpus-as-output” and “corpus-as-input” principles (Stefanowitsch and Flach 2017: 101–3). The corpus-as-output principle posits that, based on domain-general effects, corpus data can be used for “inferences about the mental representations” (Stefanowitsch and Flach 2017: 102–3, as cited in Hoffmann 2019: 18), while the corpus-as-input principle states that corpus data provides evidence of “the input that speakers [...] are exposed to” (Hoffmann 2019: 18), thus influencing the form of their mental networks (Stefanowitsch and Flach 2017: 103). For the purposes of the present study, therefore, it is assumed that corpora provide adequate data to detect the entrenchment of constructions in the mental network of a language, and thus, also the CC in English.

The following corpora were selected as data sources for the present investigation:

- British National Corpus, 100 m words (Davies 2004)
- Corpus of Contemporary American English, 520 m words (Davies 2008)
- Corpus of Global Web-based English, 1.9 bn words (Davies 2013)

They are discussed in more detail, including how they were queried, in section 2.3. These corpora were chosen for several reasons, but primarily because of their size – COCA, for example, has been referred to as “one of the largest corpora of PdE” (Hoffmann 2019: 21). As the CC is an infrequent construction smaller corpora such as ICE would simply yield too little data for the purposes of this investigation. Davies and Fuchs note that “one important limitation is the size of the individual components in ICE [which] sometimes do not provide enough data for in-depth research on [...] variation with medium- and lower-frequency syntactic constructions” (2015b: 2). In fact, Hoffmann, in his CC study based on the ICE and BROWN corpora, clearly states that “much future research drawing on bigger corpora [...] is needed” (2019: 19). In this context, Hoffmann et al. have referred to COCA as “an indispensable tool for mildly frequent structures such as the CC construction” (2019: 10). In fact, there appears to be a general view in the literature that large corpora such as GloWbE are currently “the best source of data: free, fast, vast” (Horch p.c., cited by Mair 2015: 32). In addition to the massive size of GloWbE, this corpus furthermore contains 20 varieties as opposed to e.g. the 13 varieties of ICE (cf. Davies and Fuchs 2015:2), which allows for a much more fine-grained analysis of DM stages. Finally, the popularity of BNC, COCA, and GloWbE in research is also evident from a simple Google scholar search for each of the

corpus names and for articles published from 2015-19 (which of course can only serve an approximate measure), as Table 2.1⁶ shows.

Table 2.1 Google scholar search results for BNC, COCA, and GloWbE

Year	BNC	COCA	GloWbE
2015	2400	1150	176
2016	2240	1210	166
2017	2370	1330	202
2018	2320	1410	206
2019	2220	1430	185
Total	11550	6530	935

Further reasons for choosing BNC, COCA, and GloWbE lie in the fact that they were compiled by the same researchers, allowing for maximum comparability. Davies mentions that COCA, for example, “was designed to be roughly comparable to BNC” (2009: 161). Furthermore, they are all annotated with the same tag set (CLAWS, cf. Garside and Smith 1997), which made queries considerably easier and again, with regard to annotation errors (see above), improved comparability.

What remains is the question of how exactly evidence of the entrenchment of constructions can be found. In this context, two fundamental concepts are token and type frequency (see above), where type refers to “the general existence of a [construction]⁷ in a corpus, while a token is one instance” (Lange and Leuckert 2020: 59). While token frequency thus allows to make inferences about more specific and substantive constructions such as cross-clausal associations with regard to lexical fillers, type frequency is important because it indicates that structures “have been encountered with many different lexicalizations”, thus leading “to the entrenchment of [...] more abstract constructions” (Hoffmann 2019: 9). Concerning the CC network, this in turn allows the identification of meso-constructions with regard to the filler and clause slots such as the cross-clausal associations that Hoffmann et al. (2019; 2020) determined in their COCA and BNC data (see section 1.1).

This interaction of type and token frequency reflects the bottom-up nature of usage-based approaches, which posit that language acquisition is a result of a speaker’s exposure to language (see section 1.2). The result of this exposure is a “mental construction network that ranges from more specific [...] to more schematic constructions” (Hoffmann 2019: 9). In usage-based approaches, the point of departure for any description of the mental grammar of a language, including the CC network, is thus token and type frequency. Based on these, a “fine-tuned, weighted taxonomic network of abstract and general as well as more specific and lexicalized constructions” (Hoffmann 2019: 11) can be determined. The meso- and macro-

6 The search terms used were “British National Corpus”, “Corpus of Contemporary American English”, and “GloWbE”. It is acknowledged that the idea for a Google Scholar search to demonstrate the wide use of BNC, COCA and GloWbE was inspired by an unrelated presentation, held by my colleague Thomas Brunner in November 2018 at the University of Bamberg, Germany.

7 Lange and Leuckert originally refer to “the general existence of a *word*” (2020: 59; emphasis JH). In the context of the present study and following the constructional approach that the concept of linguistic sign (see section 1.2) can also apply to syntactic patterns, ‘word’ has been replaced with ‘construction’ in this definition.

levels of these networks amount to the abstract representation of language (see research question 1), and can contribute to understanding the ‘language mechanism’ that is at work below the surface of language (cf. section 1).

Of course, ‘raw’ frequencies in themselves are not very useful for determining entrenchment. Not only are CCs a low-frequency phenomenon, but the corpora and subcorpora (i.e., the individual varieties in GloWbE) employed in the present investigation vary in size, in some cases considerably. COCA (520 m words), for example, is more than five times larger than BNC (100 m words), and in GloWbE, the United States (US) and Great Britain (GB) components each consist of about 386 million words, while the Ghanaian and Tanzanian components are only about one tenth this size, with 39 million and 36 million words, respectively (Davies and Fuchs 2015b: 5). Therefore, it was “necessary to employ statistical tests that not only correct for the unequal sample sizes of the various corpora but that are also robust in the face of low-frequency phenomena” (Hoffmann 2019: 22). The present study relies on two types of statistical tests to determine whether a phenomenon in the corpus data is indeed significant and can thus be considered an entrenched construction, with the aim of detecting “subschemas of the CC construction across [...] various varieties” (Hoffmann 2019: 23): hierarchical configural frequency analysis (HCFA) (2.1.1.1) and Covarying-collexeme analysis (2.1.1.2). Furthermore, so-called Large-Number-of-Rare-Events (LNRE) models, which allow for comparison of (sub)corpora of different sizes, will be used to investigate lexical fillers across GloWbE varieties (2.1.1.3).

2.1.1.1 HCFA

In line with Hoffmann’s (2019) methodology, the so-called ‘hierarchical configural frequency analysis’ test was used to investigate “the association of two or more [categorical] variables” (Hoffmann 2019: 22; who refers to Bortz, Lienert and Boehnke 1990: 155-57 and Gries 2008: 242-54). Originally used in psychology and medical research (Hilpert 2013: 56), HCFA has established itself in corpus linguistics as a powerful tool for statistical analysis. As noted by Hoffmann, one advantage of HCFA over a regular goodness-of-fit chi-square test is that it can “be applied to data sets with three or more factors”, performing “a goodness-of-fit test for each factor combination” (2019: 23). With regard to the present investigation, HCFA thus made it possible to test for cross-clausal associations while taking into account the effect of varieties – in Hoffmann’s words, “an analysis in which the association of three variables – [slot] in C1, [slot] in C2 and the effect of variety – is tested” (2019: 23).

Against the background of a CxG approach to language, HCFA is thus an important tool that makes it possible to determine “the subschemas of a construction [...], what characteristics they share with the higher-order construction, and what characteristics set them apart from one another” (Hilpert 2013: 65, as cited by Hoffmann 2019: 23). In other words, HCFA allows researchers to paint a detailed picture of a constructional network, or more specifically, its nodes. Hilpert explains how HCFA works in more detail:

HCFA assesses for each cell in the table whether its contribution to the overall chi-squared value exceeds a certain threshold. Assessing each individual cell after the fact means that what is tested is no longer a single null hypothesis [...] but in fact a series of null hypotheses, each of which holds that for a given cell in the table, the observed frequencies will roughly equal the expected frequencies. Whenever multiple hypotheses are tested, the required significance levels have to be

adjusted downward, that is, the usual $p < 0.05$ needs to be made smaller. This can be done through a procedure such as the Bonferroni correction [...]. (2013: 62-3).

Following Hoffmann (2019), the *HCFA 3.2* script⁸ for *R* (Gries 2004) was employed for the analysis of the data of the present study. A detailed account of how the *HCFA 3.2* script works is provided by Hoffmann (2019: 22-23) – most importantly, it “employs exact binomial tests, which are more robust [...] than simple chi-square tests” (Hoffmann 2019: 23).

An advantage of the *HCFA 3.2* script for *R* that was used in the context of the present study is that it corrects for differences in sample sizes (Hoffmann 2019: 23 and 206) by means of the so-called coefficient of pronouncedness (*Q*), which is, according to Hoffmann, “a sample size-independent measure of effect size ranging from 0 to 1 [...] equivalent to r^2 ” (2019: 23). Thus, an “uneven distribution of [...] data is unproblematic since HCFA corrects for such phenomena” (Hoffmann 2019: 206). This is important with regard to the different sizes of the corpora and their components (in the case of GloWbE, see section 2.3.1.3) that were used as sources of data for the present investigation. The *HCFA 3.2* script yields *p*-values, whose significance is provided using asterisks in a separate column of the results tables labeled *DEC*. Following what Hoffmann refers to as “standard practice” (2019: 23), results will be therefore provided with asterisks depending on significance thresholds as follows:

- $p < 0.05 \cong *$
- $p < 0.01 \cong **$
- $p < 0.001 \cong ***$

HCFA results tables also contain information about the observed and expected frequencies of each configuration, and “<” or “>” to indicate whether it is more or less frequent than expected. To facilitate the interpretation of data, HCFA results tables will have light gray shading to indicate configurations “that occur statistically significantly more often than expected by chance”, and “dark-gray shading for those that occur less often than expected by chance”, a practice adopted from Hoffmann (2019: 174). Preferred configurations are referred to as “types”, dispreferred ones as “anti-types” (Brunner and Hoffmann 2020: 21). The results tables also contain a *Q* column, which denotes the effect size, or in other words, the configuration strength of a given combination. To save space, some HCFA tables are abridged in the present study to exclude combinations with a *Q* of 0, i.e., values “which explain no variance” (Brunner and Hoffmann 2020: 21). Table 2.2, adopted from Brunner and Hoffmann’s study on the *way*-construction (2020: 16), shows the typical output of Gries’ *HCFA 3.2* script for *R* (2004).

What this table shows is that the verb lemma *FIND* “is significantly associated with Phase-III varieties” (Brunner and Hoffmann 2020: 16). This is evident from the symbol ‘>’ in the *Obs-exp* column, which indicates that this configuration occurred significantly more often than could be expected by chance. The shading is light gray, indicating a type. Conversely, the combination of the verb lemma *work* with stage III-varieties is shaded dark gray, indicating that it occurred significantly less often than expected, and is therefore an anti-type. In the column labeled *DEC*., we can see the significance of the results, where e.g. three asterisks

8 The dialog of the script offers two types of significance testing, “conservative: binomial with Bonferroni” (see above) and “more powerful: Holm sequentially rejective” (Gries 2004). In the present study, the latter option was selected to be able to determine a higher number of significant configurations (cf. Gries 2008: 251).

*** indicate $p < 0.001 \cong ***$. Note that if any of these configurations had a Q value of 0, it would have to be disregarded, as it could not be assumed to explain variance.

Table 2.2 Example of a HCFA results table: Two-way associations between verb lemma and variety (adapted from Brunner and Hoffmann 2020: 16)

Verb lemma	Evol. stage	Frequ.	Exp.	Cont. chisq.	Obs-exp ⁹	p -value	DEC.	Q
FIND	III	488	386.92	26.408	>	0.001363747222242	**	0.007
SLEEP	III	32	11.78	34.715	>	0.003813387394547	**	0.001
WORK	III	208	295.88	26.101	<	0.000147331970611	***	0.006
WORK	V	829	707.44	20.888	>	0.012103038783283	*	0.009
PAY	GB	55	21.48	52.291	>	4.81E-06	***	0.002

One disadvantage of HCFA is that it cannot be used on data sets consisting of low token numbers, as Hoffmann notes (2014b: 173). An obvious remedy is increasing the size of data sets, and the present study will do so with considerably larger corpora samples. The ICE data set used by Hoffmann (2014b, 2019), for example, consisted of 352 C1C2 tokens, while the present study uses data from GloWbE with more than 5,000 tokens, amounting to an almost 17-fold increase. However, the present study will not rely on size alone, but also employ a type of statistical analysis that “employs a Fisher-Yates exact test and can therefore also be applied to low frequency data” (Hoffmann 2014b: 173), thus addressing an issue with HCFA. This method, referred to as ‘covarying-collexeme analysis’, will be discussed in the following section.

2.1.1.2 Covarying-collexeme analysis

Based on the tried and tested methodology of previous corpus studies that investigated the CC construction in various languages (Hoffmann et al. 2019; Hoffmann et al. 2020; Horsch 2021), the present study relies heavily on the so-called covarying-collexeme analysis (Stefanowitsch and Gries 2005), which “is the standard test¹⁰ in Construction Grammar for the association of two constructional elements” (Hoffmann et al. 2019: 11, referring to Gries 2015a, 2015b). Regarding CCs, covarying-collexeme analysis can be used to determine statistically significant cross-clausal slot associations and thus, the entrenchment of meso-constructions. As Schmid and Küchenhoff also point out, collostructional analyses (a ‘family’ of statistical analyses developed by Stefan Th. Gries and Anatol Stefanowitsch, cf. Stefanowitsch and Gries 2003; 2008; Gries and Stefanowitsch 2004; 2010; 2006; Gries 2011) are used to provide “empirical support [...] to construction-based syntactic theories” (2013: 537).

The covarying-collexeme analyses in the present study were carried out using the *Coll.analysis 3.2a* script for *R* (Gries 2007), which “compares actual frequencies of co-

9 In Brunner and Hoffmann’s table, this column is labeled “Type/ Anti-type” (2020: 16).

10 Note that while “the standard test applied by linguists to two-by-two tables [...] is the chi-square test”, these “always require the expected frequencies of all cells to be greater than 5” (Hoffmann 2011: 23; referring to Woods et al. 1986: 144f.). For this reason, covarying-collexeme analysis relies on the Fisher-Yates exact test, which does not require minimum frequencies (see Hoffmann 2011: 23).

occurrence with expected ones on the basis of a 2-by-2 distribution table” (Stefanowitsch and Gries 2005: 9). An example of what such a distribution table looks like is illustrated in the following using the lexical filler combination *sooner*_{C1} and *better*_{C2} as in example (2.3), a combination which Hoffmann et al. found to be significantly associated in their 2019 COCA study (2019: 15).

(2.3) *I know you are only trying to help but [the **sooner** we get this over with]_{C1} [the **better**.]_{C2}*
(BNC W_fict_prose BMW)

Now, as Hoffmann notes, “in order to statistically assess the association” of combinations such as *sooner*_{C1} and *better*_{C2}, “this syntagm must be compared to all other logically possible lexicalizations” (2011: 23). In our case, this means that the script will compare actual instantiations of *sooner*_{C1} in combination with *better*_{C2} to the frequency of cases where

- *sooner*_{C1} occurs with all lexical fillers in C2 **other** than *better* (*sooner* + \neg *better*)
- *better*_{C2} occurs with all lexical fillers in C1 **other** than *sooner* (\neg *sooner* + *better*)
- **neither** *sooner*_{C1} **nor** *better*_{C2} occur (\neg *sooner* + \neg *better*)

The “input to statistical tests that aim to measure the association between constructions and lexemes” (Schmid and Küchenhoff 2013: 535), is illustrated by so-called two-by-two distribution tables¹¹. Table 2.3 is an example of such a table as it would be employed by the Coll.analysis 3.2a script to calculate the *sooner*_{C1} × *better*_{C2} combination.

Table 2.3 2-by-2 distribution table as used in covarying-collexeme analysis (cf. Stefanowitsch and Gries 2005: 9; Hoffmann 2011: 23)

	<i>better</i> in C2 (word <i>better</i> in C2)	\neg<i>better</i> in C2 (all words except <i>better</i> in C2)
<i>sooner</i> in C1 (word <i>sooner</i> in C1)	Frequency (<i>sooner</i> + <i>better</i>)	Frequency (<i>sooner</i> + \neg <i>better</i>)
\neg<i>sooner</i> in C1 (all words except <i>sooner</i> in C1)	Frequency (\neg <i>sooner</i> + <i>better</i>)	Frequency (\neg <i>sooner</i> + \neg <i>better</i>)

Note that this particular table is only one calculation of many (*all possible* combinations, in fact, including those that are not attested in the data) that the script will carry out, making it possible to shed light on the “set of choices available in a given position of a syntagmatic structure *in relation to the set of choices available in another position*” (Stefanowitsch and Gries 2005: 10, emphasis in source). This means, in CxG terminology, that the “co-occurrence between three signs (lexeme₁, lexeme₂, and construction)” (Stefanowitsch and Gries 2005: 10) can be determined. With regard to CCs, covarying-collexeme analysis can thus help compare the choices for a particular slot in C1 to the choices for the corresponding slot in C2, based on the ‘raw’ corpus data. Based on the results thus obtained, researchers can determine cross-clausal associations across C1 and C2.

The Coll.analysis 3.2a script uses a Fisher-Yates exact test, which is “very precise because it handles even small frequencies well” (Horsch 2021: 210, referring to Gries 2015b: 313). Perhaps the most important value that the script provides is the so-called ‘collostructional strength’ value, a negative log-transformed *p*-value (cf. Gries 2007) that is used to “gauge the

¹¹ As Schmidt and Küchenhoff note, such a “contingency or two-by-two table [is] familiar to many linguists from applications of the χ^2 test” (2013: 534).

degree of attraction” (Schmid and Küchenhoff 2013: 535) between constructions and lexemes. As Schmid and Küchenhoff note, collostructional strength is nothing but “the p -value of [the Fisher-Yates exact] test”, where “[t]he null hypothesis [...] is the independence of occurrence” of lexemes and construction (2013: 535), such that “[t]he lower the p -value, the stronger the evidence against the null hypothesis” (Schmid and Küchenhoff 2013: 539). In other words, collostructional strength as output by the Coll.analysis 3.2a script indicates the “probability of obtaining [a particular] distribution or a more extreme one” (Schmid and Küchenhoff 2013: 535). The (log-transformed) collostructional strength value as provided by the Coll.analysis 3.2a script corresponds to p -values as follows, with the asterisks indicating the same significance thresholds as for the HCFA analysis output (see section 2.1.1.1 above):

- p -value of 0.001 = collostructional strength value of 3 (***)
- p -value of 0.01 = collostructional strength value of 2 (**)
- p -value of 0.05 = collostructional strength value of 1.30103 (*)

This means that values higher than 1.30103 amount to a p -value of less than 0.05, the significance threshold for the present study. The reason for providing log-transformed values instead of p -values is that it is easier to interpret results that are significant and thus interesting (Stefanowitsch and Gries 2005: 7, Gries et al. 2005: 671) – in a nutshell, “the smaller the p -value, the higher the strength of the association” (Schmid and Küchenhoff 2013: 536). It is simply more difficult to appreciate the statistical significance of a p -value when it is not transformed and provided as e.g. 0.0000000000001. As a negative log-transformed value (which indicates the number of decimal places), this would amount to 13.37, a number that is easier to put into context when compared to the significance threshold, 1.30103 (as described by Horsch 2021: 210). A further advantage of the collostructional strength value is that it can show positive (‘attraction’) as well as negative (‘repulsion’) association strength, where the value is shown with “a plus when the observed frequency is higher than the expected one” and a minus, when an observed frequency is lower than expected (Stefanowitsch and Gries 2005: 7). As an example, a collostructional strength value of -3 corresponds to a considerably lower observed frequency of co-occurrence of two components of a construction than the expected frequency, so that the script would yield ‘repulsion’ in a separate column. If, however, the value is +3, this would mean that the observed frequency is significantly higher than the expected frequency, and the script would output ‘attraction’ in the column. In both cases, the actual p -value would be 0.001, a result from which attraction or repulsion is not evident. Thus, the table that the Coll.analysis 3.2a script provides allows for a more precise interpretation of results.

Finally, the script also provides two so-called ΔP values, which indicate the dependence of one word on another. A good example to illustrate this concept is provided by Gries (2015a): The two words *of course* are strongly associated, but *of* will co-occur with more words than *course*, which combines with only few words. This “inequality in dependence” (Horsch 2021: 210) expressed by the ΔP values, which range from -1 (strong repulsion) to +1 (strong attraction). The ΔP values thus provide what Hoffmann et al. have referred to as “cue validity” (2019: 20) for the observed words in two different constructional slots. Concretely, this means that “the ΔP value for word 1 indicates the likelihood of observing word 2 given word 1” and conversely, “the ΔP value for word 2 indicates the likelihood of observing word 1 given word 2” (Horsch 2021: 211). This means that the Coll.analysis 3.2a script allows

researchers not only to find out whether two words in a construction are statistically significantly associated, but also “how dependent they are on each other” (Horsch 2021: 211).

An example of what the output table of the Coll.analysis 3.2a script looks like is provided in Table 2.4, which shows the results of a covarying-collexeme analysis of lexical fillers across C1 and C2 in Horsch’s (2021) corpus investigation of Slovak CCs based on a 500-token sample from the Slovak National Corpus. Note that combinations will be “ranked from attraction to repulsion and from the highest to the lowest collostructional strength” (Horsch 2021: 212), and rows which contain statistically significant results will have gray shading, two conventions (cf. Hoffmann 2019 and Hoffmann et al. 2019) that will also be adopted for the current investigation. Reflecting the conventions adopted for HCFA results tables, in the present study light gray shading will be used to indicate significant attraction and dark gray shading significant repulsion.

Furthermore, large tables (i.e., analyses that include many possible combinations, such as lexical fillers) will only show combinations with an expected frequency of ≥ 5 , “an assumption often required for goodness-of-fit tests such as the chi-square test” (Hoffmann et al. 2019: 15; referring to Gries 2009: 152), and a way of avoiding the identification of pairs as significant that have an observed frequency of only 1 (cf. Hoffmann et al. 2019: 15). The first two columns contain the combinations across the two slots that are being investigated, in the case of the present study, usually a slot in C1 and the corresponding slot in C2. The third and fourth columns show the frequency of each level (in this case, lexical fillers) in the C1 and C2 slots, while the fifth column shows how often the two appear in combination. The sixth column shows the expected frequency of the combination, while the seventh column provides information about attraction or repulsion (see above). Finally, the last three columns provide the ΔP values in each direction, and most importantly, the collostructional strength value.

Table 2.4, adopted from Horsch (2021: 212), shows what the results table of a covarying-collexeme analysis looks like in the present study. From the table, it is evident that in the data set there are “three combinations that are attracted with significant collostructional strength [...] i.e., with a value of more than 1.30103” (Horsch 2021: 212). Note that the strongest attraction is between the lexical filler pair $skôr_{C1} \times lepšie_{C2}$ ‘sooner’ \times ‘better’, as indicated by a collostructional strength value of 13.37***. The three asterisks indicate that the significance threshold of $p = 0.001$ has been crossed. In fact, a collostructional strength of 13.37 would amount to “a p -value of less than 0.0000000000001” (Horsch 2021: 213), demonstrating how the negative log-transformed values provided by the script as ‘Collostructional strength’ facilitate the interpretation of results. Note that the table also shows significant repulsion between certain pairs of words, e.g. $viac_{C1} \times lepšie_{C2}$ ‘more’ \times ‘better’, with a collostructional strength of 2.4**.

On a final note, it must be conceded that the statistical analysis of corpus data using covarying-collexeme analyses is not entirely uncontroversial. A comprehensive overview of the drawbacks of covarying-collexeme analysis is provided by Schmid and Küchenhoff (2013), for example. In the context of the present study, perhaps the most relevant point on their list of criticisms is that covarying-collexeme analysis relies on p -values as a measure of attraction and repulsion. However, it should not be forgotten that the ‘collostructional strength’ values that form the output of a covarying-collexeme analysis are actually derived from p -values, which “do not [...] measure the *strength* of association between lexemes and constructions, but rather the *likelihood* with which [...] the null hypothesis can be rejected”

(Schmid and Küchenhoff 2013: 539-540, emphasis JH). Accordingly, Baayen notes that “[f]rom a statistical perspective, it is somewhat odd to derive a measure from a p-value” (2011: 16, quoted by Schmid and Küchenhoff 2013: 539). That is, the *p*-value actually only indicates how strong or weak the evidence is against the null hypothesis, and not actually any degree of attraction/repulsion. This needs to be borne in mind when dealing with collostructional strength values.

Table 2.4 Example of output from a covarying-collexeme analysis of lexical fillers in C1 and C2 in Slovak using the Coll.analysis 3.2a script (adapted from Horsch 2021: 212)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
<i>skôr</i>	<i>lepšie</i>	52	97	35	11.41	attraction	0.51	0.31	13.37	***
<i>d'alej</i>	<i>viac</i>	110	108	47	26.88	attraction	0.24	0.25	6.21	***
<i>viac</i>	<i>viac</i>	88	108	31	21.5	attraction	0.13	0.12	2.13	**
<i>viac</i>	<i>menej</i>	88	30	8	5.97	attraction	0.03	0.07	0.64	n.s.
<i>d'alej</i>	<i>menej</i>	110	30	9	7.47	attraction	0.02	0.05	0.5	n.s.
<i>d'alej</i>	<i>lepšie</i>	110	97	3	24.14	repulsion	-0.26	-0.28	9.7	***
<i>skôr</i>	<i>viac</i>	52	108	2	12.71	repulsion	-0.23	-0.13	4.47	***
<i>viac</i>	<i>lepšie</i>	88	97	10	19.31	repulsion	-0.13	-0.12	2.4	**
<i>dlhšie</i>	<i>lepšie</i>	35	97	2	7.68	repulsion	-0.18	-0.08	2.1	**
<i>dlhšie</i>	<i>viac</i>	35	108	3	8.55	repulsion	-0.17	-0.07	1.88	*
<i>viac</i>	<i>väčšmi</i>	88	41	4	8.16	repulsion	-0.06	-0.11	1.23	n.s.
<i>d'alej</i>	<i>väčšmi</i>	110	41	9	10.2	repulsion	-0.01	-0.03	0.39	n.s.

A second point of criticism that must be mentioned here is concerned with sample sizes. As Schmid and Küchenhoff note, in two-by-two contingency tables “[l]arger samples reduce *p*-values as compared to smaller samples with the same internal distribution” (2013: 547). Thus, an increased sample size means a smaller *p*-value, “even if the internal structure of the dataset remains unchanged” (Schmid and Küchenhoff 2013: 540), i.e., the proportions stay the same. Schmid and Küchenhoff provide the following simple example to illustrate this problem:

[W]hen the numbers in the two-by-two contingency table are all doubled, then the *p*-value decreases, even though one would assume that the attraction strength remains constant, as the proportions between the numbers remain constant, too. (2013: 540)

This issue has also been noted by Hoffmann, who mentions that covarying-collexeme analysis, “like many other statistical tests, will yield a greater number of significant results as sample size increases” (2019: 176). In the context of the present study, this means that comparisons of results between the different corpora (BNC, COCA, GloWbE and its individual varieties), as well as comparisons with earlier studies that were based on considerably smaller corpora (e.g. BROWN, ICE; cf. Hoffmann 2019) always have to be taken with the proverbial grain of salt.

2.1.1.3 LNRE models

An important indication of the degree of entrenchment of (meso-)constructions is the productivity of their slots. As Hoffmann notes (referring to Barðdal 2008, 2011),

the productivity of abstract constructions can be seen as an inverse correlation of type frequency and semantic coherence (such that the higher the type frequency, the less specific a construction's meaning. (2019: 150)

This measure of entrenchment is particularly relevant for investigating and comparing English varieties in the context of the Dynamic Model. As has previously been noted, we can assume a correlation of slot productivity and Dynamic Model stage, such that varieties that are further along the cycle exhibit higher productivity due to their greater number of and deeper entrenchment of abstract meso-constructions (Hoffmann 2011, 2014b, 2019). This is summarized in Brunner and Hoffmann's "productivity hypothesis", which posits that "varieties in low stages of the Dynamic Model show less productivity of [...] slots of [a] construction than varieties in high developmental stages" (2020: 9). In other words, the "productivity of [...] slots of the construction correlates positively with a variety's phase in the Dynamic Model" (Brunner and Hoffmann 2020: 1).

But how can productivity be measured? As Brunner and Hoffmann note, "several quantitative measures of [...] productivity have been put forward" in linguistics, usually based on methods that have been developed in the context of morphological studies (2020: 12). This includes "lexical measures" (Baayen 2008: 229) such as type-token frequency¹² as well as calculating the ratio of hapax legomena versus total tokens of a construction, but such calculations are problematic because they "are highly dependent on sample size", so that "they cannot be used to compare the results from (sub-)corpora of different sizes" (Brunner and Hoffmann 2020: 12, who also refer to Baayen 2008: 229-236 in this regard). This is because "words in any text do not exhibit a normal distribution" (Brunner and Hoffmann 2020: 12); rather, their distribution is "characterized by large numbers of very low probability elements" (Baayen 2008: 229). Baayen explains this in more detail:

If we read through a text or corpus, and at regular intervals keep note of how many different types we have encountered, [...] the number of types increases, first rapidly, and then more and more slowly." (2008: 222)

Thus, what Baayen refers to as the "growth curve of vocabulary" is characterized by it showing "no sign that the curve is anywhere near reaching a stable value" (2008: 222-223) as one progresses along the *x* axis, along which the total number of tokens are plotted. This makes it extremely difficult to compare corpora of different sizes in terms of productivity, since it is difficult to predict how the type-token curve of a small (sub-)corpus might develop when comparing it to a larger (sub-)corpus. Of course, this is also an issue in the present study, which heavily relies on data from the GloWbE corpus. GloWbE consists of 20 components, each from a different variety of English, but its subcorpora differ greatly in size (cf. also section 2.3.1.3): While the largest components, BrE and AmE, consist of almost 500 million words each, many of the smaller components are barely one tenth this size, in the ballpark of 40-50 million words (TanzE constitutes the smallest component, with only 35 million words).

¹² Commonly, these terms are defined as follows: 'type' amounts to the "number of unique words" and 'tokens' to "the number of words regardless of their identity" (Baayen 2008: 222).

To address this issue, Brunner and Hoffmann have recently suggested using so-called “Large-Number-of-Rare-Events (LNRE) models” (2020: 10; referring to Evert 2004; Baayen 2008; Zeldes 2013; Baroni and Evert 2014) to account for different subcorpus sizes when measuring the lexical productivity of constructional slots. An LNRE distribution basically reflects the fact that “word frequency distributions [...] are characterized by large numbers of very low probability elements” (Baayen 2008: 229). What LNRE models do is “random sampling and extrapolating vocabulary growth curves from the [corpus] data” (Brunner and Hoffmann 2020: 12), tracking “the number of new types as the sample size increases [...] and, based on the properties of LNRE distributions, predict[ing] the productivity of a schematic slot beyond the empirical sample size” (Brunner and Hoffmann 2020: 12). Originally, LNRE models were suggested for morphological studies (Baayen 2008), but assuming that more complex constructions, including CCs, are also form-meaning pairings, these models can easily be extended to syntactic studies (Brunner and Hoffmann 2020: 12).

In line with Brunner and Hoffmann’s approach, the present study will thus employ LNRE models to measure and compare slot productivity across varieties and DM stages. To do so, Evert and Baroni’s (2007) *zipfR* package¹³ (Evert and Baroni 2020) for *R* for Windows will be used. This method uses “finite Zipf-Mandelbrot models¹⁴ [...] to fit LNRE models to frequency data” (Brunner and Hoffmann 2020:12). LNRE curves, based on Brunner and Hoffmann’s methodology, will thus be plotted for every DM stage for the productivity of the lexical filler slots in C1 and C2. On top of that, LNRE modelling will be employed to compare the productivity of C1C2 vs. C2C1 structures. The curves will be plotted to a point that corresponds to the largest amount of tokens of any stage, thus permitting “a straightforward comparison of the productivity of constructional slots” (Brunner and Hoffmann 2020: 13) across DM stages. The *R* script to calculate LNRE models and plot the corresponding curves is based on Thomas Brunner’s script that was used in Brunner and Hoffmann’s (2020) study on the *way*-construction.

2.1.2 Magnitude estimation experiments (METs)

Following Hoffmann et al., who note that “[c]orpus data can [...] be said to offer one, but obviously not the only window onto the entrenchment of constructions” (2019: 10), the present investigation opens a further window on the mental network of the English CC construction by means of introspective judgments provided by several hundred English speakers of six varieties of English – American English (AmE), Singapore English (SingE), White South African English (WSAfE), Coloured South African English (CSAfE), Black South African English (BSAfE) and Kenyan English (KenE). Concretely, it was decided to implement the magnitude estimation method (Bard et al. 1996; Cowart 1997: 73-84, Hoffmann 2011, Hoffmann 2013b). This method is discussed in more detail below, but in

13 The exact maths behind how the LNRE models are computed using the *zipfR* package are highly complex and difficult to grasp, much more so for novices such as the author. That is, the author has to admit to not fully understanding the exact ‘mechanics’ underlying LNRE model computing. However, even Baroni and Evert themselves explicitly recommend “forget[ting] about all the math and us[ing] LNRE models as black boxes” (2006).

14 An in-depth discussion of the statistical background of LNRE models would be beyond the scope of the present study. For more detailed information on the mathematical aspects, cf. Baayen (2008) and Baroni and Evert (2014).

essence, it is an approach where “subjects do not have to rate stimuli on a scale [...] which might artificially limit their choices” but rather “decide on their own scale and make as many fine-grained choices as they deem necessary” (Hoffmann 2013b: 103). The underlying principle of this approach is that speakers will give low-frequency phenomena lower acceptability ratings than high(er) frequency phenomena, but that low-frequency phenomena will still receive considerably better ratings than ungrammatical structures, which are presented as fillers/distracters. This will make it possible to determine whether features of the CC construction whose grammaticality has been debated in the literature (e.g. *that*-complementizers in C1 and/or C2, see section 1.1) are in fact ungrammatical or simply less prototypical features of the CC – as Hoffmann notes, METs “can help to [...] separate more prototypical grammatical constructions from less prototypical ones” (2013b: 100).

While not as commonly used as corpus data, experimental approaches based on the introspection of multiple speakers (as opposed to the intuition of only one speaker, who is usually the investigator himself) have slowly found their way into usage-based studies, not least because “experimental work on grammaticality judgments has been advanced by improved techniques for eliciting judgments” (Bresnan 2007: 91, referring to Schütze 1996, Cowart 1997; Bard et al. 1996). In the context of usage-based approaches, psycho-linguistic experiments featuring introspective judgments follow the assumption that “grammar is directly based on linguistic experience” (Bybee 2010: 10), and that “language users’ implicit knowledge of their language is more powerful than has been recognized under the idealizations of categorical models of grammaticality” (Bresnan 2007: 91). In fact, there have been repeated calls in usage-based theory for a combination of corpus approaches with introspective experiments. Hawkins’ Performance-Grammar Correspondence Hypothesis (PGCH), for example, explicitly states that “[g]rammars have conventionalized syntactic structures in proportion to the degree of preference in performance, as evidenced by patterns of selection in corpora *and by ease of processing in psycholinguistic experiments*” (2004:3, emphasis JH), and Szmrecsányi et al. suggest “spot-check[ing] the cognitive robustness of [...] corpus-derived probabilities via rating experiments” (2016: 134).

Note that the term ‘experiments’ as generally understood in usage-based approaches does not entail any claims about measuring grammaticality in the Chomskian sense, i.e., whether a sentence either belongs to the language system and is therefore ‘grammatical’, or does not, making it ‘ungrammatical’ (as discussed in Hoffmann 2013b: 104). Rather, such experiments measure *acceptability* (Hoffmann 2013b: 104; who also refers to Featherston 2007a,b; Fanselow 2007; and Newmeyer 2007), that is, the degree of entrenchment of a construction. This is a distinction that has some important implications. While the experiments that are part of the present investigation were carefully designed and carried out according to best practices, in an attempt to “get as close to grammaticality as possible” (Hoffmann 2013b: 104), their results do not allow for making conclusive claims about the grammaticality (or ungrammaticality, for that matter) of the investigated structures in the Chomskian sense.

While experiments come with certain disadvantages – for example, Bresnan points out that “constructed sentences used in many controlled psycholinguistic experiments are often highly artificial, isolated from connected discourse, and subject to assumptions about default referents” (2007: 91, referring to Roland and Jurafsky 2002), and Hoffmann refers to their “unnatural setting and [...] unnatural types of stimuli and responses” (2019: 18, also referring to Gries 2013: 94-5 in this respect), they nevertheless complement corpus data well, as

Hoffmann also points out: “[S]everal studies have [...] shown that the results from experimental and corpus-based studies often converge” (2019: 18). Apart from Hoffmann’s study on preposition placement (2011), a good example of this can also be found in Bresnan and Ford’s study that featured “three pairs of experiments [in which] Australians and Americans responded reliably to corpus model probabilities” (2010: 168). It is thus no surprise that in recent corpus-based investigations on the CC, an experimental approach to corroborate their findings has been repeatedly advocated (cf. Hoffmann et al. 2019: 10; Hoffmann 2019: 18).

As has been discussed earlier, an experimental approach is a good way to complement corpus data, particularly in addressing the ‘negative data’ problem. Furthermore, experiments can contribute to clarifying unresolved disputes in literature based on introspection. As Bresnan notes, “[m]ismatches between grammaticality judgments reported by linguists and the actual language use of speakers and writers are surprisingly common, particularly in areas of theoretical syntax [...] where subtle contrasts are invoked” (2007: 84).

Examples of such subtle contrasts can be found in various CC features. Previous introspective studies have led to debates (see section 1.1) about the status of *that*-complementizers and subject-auxiliary inversion, for example. However, such issues can hardly be answered using the introspection of individual researchers; Hoffmann therefore speaks of the “controversial status of speakers’ intuitions” that are “often elicited in an unscientific way” (2013b: 99). I.e., such data are neither valid, nor reliable, nor objective. Note that Hoffmann also criticizes that such introspective studies “produce theory and data at the same time” (2013b: 99), maintaining that “informal methods of introspection data elicitation might [...] fail to be reliable” (2011: 12). This is an explicit argument *contra* Chomsky’s view of an “ideal speaker-listener, in a completely homogeneous speech community” (Chomsky 1965: 3f., as cited in Hoffmann 2011: 12). Chomsky’s take on introspection would, of course, make large-scale experiments irrelevant. For the purposes of the present study, however, it is assumed that “speech communities display variation on all linguistic levels” (Hoffmann 2011: 12), and that this applies to varieties of English as well. The implications for an experimental approach are thus clear: Linguistic phenomena must be tested on as many speakers as possible, “via carefully constructed experiments” so as to “ensure intra- and inter-subject consistency”, i.e., “all subjects provide equal information on all tested conditions” (Hoffmann 2011: 12-3).

This is where the Magnitude Estimation test (MET) method comes into play, a particularly effective and reliable method for eliciting judgments from speakers. METs feature relative judgments (as opposed to absolute judgments), where “subjects are asked to judge stimuli relatively to a reference item” (Hoffmann 2013b: 99), taking advantage of the fact that humans are better at making relative judgments than absolute judgments (Hoffmann 2013b: 99). This translates to “proportional relation among the numbers assigned to different stimuli”, which “should reflect the proportions of the stimuli themselves; thus a sentence that is judged twice as good as another should get a number twice as high as that assigned to the other sentence” (1997: 73-74). Formally, METs feature a set of sentences that test subjects have to rate with a number that they are free to choose. This number is given “proportional to a constant reference sentence” (Hoffmann 2013b: 99), which has previously also been assigned a number by the test subjects.

Thus, the participants are able to generate their own scale (and are not bound to, say, a Likert scale), which tends to result in more accurate judgments. Of course, this leads to the problem that it is difficult to compare results – it can be expected that there will be a high variability of scores between test subjects. For this purpose, a so-called z-score will be calculated by “subtracting the mean of a variable from an individual value and dividing the result by the variable’s standard deviation” (Hoffmann 2013b: 103; who also refers to Featherston 2004, 2005; cf. also Gries 2009: 130-32). In other words, if a participant’s z-score for a test item is, say, -0.1, this means that it is 0.1 standard deviations *below* the mean of all test items for that participant. The z-score, in turn, serves as the basis for the statistical analysis of data obtained through METs, a procedure discussed in more detail in section 2.1.2.1 below.

The tests were designed as questionnaires printed on paper, in which participants had to judge each test item with a number relative to a number they had previously assigned to a reference sentence (see above). Although a majority of participants were unfamiliar with the MET method, Cowart’s observation that participants “seem to learn to use it rapidly and reliably” (1997: 74) could be confirmed during the actual on-site experiments: After “explicit instructions” and “two training sessions in which they have to use Magnitude Estimation to judge first line length and then sentences” (Hoffmann 2013b: 102), very few participants struggled with the method or had questions. The results were then entered into a spreadsheet by members of the student assistant team at the University of Eichstätt-Ingolstadt, who normalized the data by converting it to z-scores (see above). On the cover page of the questionnaire, the participants (who remained entirely anonymous) were asked to indicate, apart from their age and gender, their country of birth and the language(s) they speak with their friends and with their parents, and which language(s) their parents use when talking to each other. This way, questionnaires could later be discarded if a subject did not meet the conditions of, say, being an L1 AmE speaker (due to having been born abroad and speaking only Chinese with his parents) or a WSAfE speaker (due to speaking only Afrikaans with her parents).

To obtain the highest possible degree of valid, objective, reliable and comparable data, “carefully constructed experimental settings” (Hoffmann 2013b: 99) had to be ensured: Apart from the careful design of the experimental questionnaires (see chapter 5 for more details), participants received detailed instructions from a researcher before starting to fill out the questionnaires, which included two preparatory practices runs to get them acquainted with the magnitude estimation Method. Additionally, the participants, who worked on the questionnaires in a quiet setting (usually university classrooms or lecture halls), were supervised at all times by two researchers, including the author.

For each experiment they completed, participants received the approximate equivalent of €10 in local currency; the funding was made available by a generous DFG research grant (DFG HO 3904/5-1). The aim was to recruit at least eight participants (or four in the case of the extraction experiments, which consisted of eight material sets, see section 5.3) per material set, i.e., in a minimum of 32 participants per experiment in each location, with twice as many in South Africa due to the complex linguistic situation there (see chapter 5 for more details on how participants were recruited). In order to achieve this goal, each participant was permitted to take part in all three experiments (i.e., *that*-complementizers, asymmetric encoding, and extraction) in locations where this was necessary. In South Africa, it was

decided to recruit three times as many participants than in the other locations due to the complex linguistic situation there. The aim of this sampling strategy was to make sure to have enough speakers of WSAfE take part in the experiments (see section 5.1.2 for a more detailed discussion of participant recruitment in South Africa).

The experiments took place from September through November 2019 at the University of Austin at Texas (USA), the University of Cape Town (South Africa), the National University of Singapore, and the University of Nairobi (Kenya). The locations were chosen so that at least one variety from each of the following Dynamic Model stages could be investigated and compared: Stage III (KenE), stage IV (SingE, BSAfE and CSAfE), and stage V (WSAfE and AmE). All expenses associated with these field trips, including flights and accommodation, were covered by the aforementioned DFG grant (DFG HO 3904/5-1).

2.1.2.1 Statistical analysis of MET data: mixed effects models

What applies to the analysis of corpus data also applies to data obtained by means of MET experiments: It is crucial that they be analyzed by means of a “thorough, sophisticated statistical analysis” (Hoffmann 2013b: 111). Regarding the METs carried out in the context of the present study, a thorough statistical analysis is also necessary because of the within-subject design of the experiments, in which “all subjects are tested on all conditions of the experiment” (Hoffmann 2013b: 111). This means that in the end, the data sets will consist of multiple measurements (‘data points’) from multiple subjects. The METs will also yield multiple measurements with regard to material sets and items, or rather, lexicalizations (see chapter 5 for details on experiment design), leading to what is known as a “nested hierarchical structure” (Winter 2020: 232), i.e., ‘item nested within material set’. Such a “repeated measures design” (Winter 2020: 233) makes it necessary to determine whether there are any significant effects that item lexicalizations, material sets, and subjects might have on participants’ judgment scores.

In other words, the experimental design, with its many repetitions (subjects, item lexicalizations, material sets), is such that dependencies – that is, “connection[s] between data points” (Winter 2020: 232) – are to be expected. For example, individual participants might provide consistently lower or higher ratings than others due to fatigue on the day of the experiment. Also, there could be lexicalization-specific effects, although great care was taken to make the item lexicalizations as comparable as possible (e.g. in terms of length and complexity). When data sets contain such dependencies, there is the risk of violation of the independence assumption, which can “have *massive* effects on the Type I error¹⁵ (false positive) rates of a study” (Winter 2020: 232, emphasis in source). This can happen because not informing a model about repetitions in experiment designs “amounts to artificially inflating the sample size” (Winter 2020: 233).

Before proceeding with a discussion of how these issues were addressed, it is important to clarify some basic terminology. First, there is the distinction between **dependent variable** and **independent variable**. The former refers to the outcome of METs, i.e., the judgments given by participants, which were normalized to z-scores (see section 2.1.2 above), while the latter refers to the various predictors that influence the dependent variable. These predictors

15 That is, “obtaining a significant effect even though the null hypothesis is actually a true characteristic of the population” (Winter 2020: 171) – in other words, erroneously rejecting a null hypothesis.

include the syntactic variables under investigation, e.g. *that*-complementizers in C1 (THAT_C1) and C2 (THAT_C2) as well as the varieties (VARIETY) from which participants were recruited. The effects that such variables have on the dependent variable are commonly referred to as **fixed effects**, because they are “repeatable covariates” (Bates 2005: 27), or in other words, “factors with repeatable levels” (Baayen 2008: 241). That is, such factors are “assumed to be constant across experiments” (Winter 2020: 236) because “the set of possible levels of the factor is fixed and each of these levels is itself repeatable” (Bates 2005: 27) – hence the term *fixed* effects.

However, because of the repeated measures design of the experiment, there may be effects that bias the data, leading to dependencies between data points (see above). Such effects are referred to as “non-repeatable covariates” (Bates 2005: 27), or **random effects** (cf. Baayen 2008: 241-2; Gries 2009: 333). That is, “variables whose levels in the study do not cover all possible levels in the population” (Gries 2009: 333) or, in other words, “a random sample from the population of interest” (Bates 2005: 27) – hence the term *random* effects. Random effects thus differ from fixed effects, which are “variables whose levels in the study cover all possible levels in the population” (Gries 2009: 333). When analyzing complex data sets with dependencies, random effects play an important role – they have, in fact, been described as “[t]he primary workhorse for dealing with clusters of non-independent data points” (Winter 2020: 234). The random effects that will be taken into account in the present study are subject (SUBJECT), item lexicalization (LEXICALIZATION), and material set (MS); an overview of the fixed (syntactic) variables examined in the present study is provided in Table 2.5. The distinction between random and fixed effects before beginning with the analysis of data is crucial for the model-building process (see below). As Kuznetsova et al. (2015: 32) note:

If random effects are not well chosen, this will affect the estimates and the hypothesis tests of the fixed-effects. Vice versa, variation in the response variable not modeled in terms of fixed-effects can partly end up in the random effects.

Thus, to “incorporate both fixed and random effects” (Baayen 2008: 242) into the analysis of data, the present study will rely on so-called mixed effects models¹⁶, where “fixed-effect factors are modeled by means of contrasts [and] random effects are modeled as random variables with a mean of zero and unknown variance” (Baayen 2008: 242). Mixed effects models are able to account for factor crossing (in the case of fixed variables) and the nested, repeated measures design of the experiments. They have also been referred to as ‘(linear¹⁷) mixed models’, ‘multi-level models’ or ‘hierarchical linear models’ (cf. Winter 2020: 232), and became popular in linguistics about a dozen or so years ago, when they were still described as “a recent development in statistics” (Baayen 2008: 259) and “very hot in linguistics” (Gries 2009: 333). However, by now, mixed models have become “very common in the language sciences” (Winter 2020: 232). The reason why mixed models have become so popular in linguistics is that they have the advantage of “simultaneous[ly] modeling different sources of variability” by “allow[ing] the analyst to model the dependent variable with a

16 The term ‘model’ as used in the following is to be understood as what Bates refers to as “[e]mpirical models”, that is, “models that are derived from the data itself, not from external assumptions on the mechanism generating the data” (2005: 27).

17 That is, “an extension of regression” (Winter 2020: 232; Field et al. 2012: 870) as opposed to nonlinear models. Linear models “are generally chosen [...] as these are much simpler to use than nonlinear models” (Bates 2005: 27).

different regression line for each subject or item” (Gries 2009: 333). As Gries notes, this is much more precise than “simply fitting one regression line over many subjects” (2009: 333).

Mixed effects models are thus “specifically designed” to account for dependencies, providing a safeguard against violating the independence assumption (as noted by Field et al. 2012: 860). Note that mixed models have also been described as “statistically superior to repeated measures [Analysis of Variance tests]” (Hoffmann 2013b: 111) for this kind of data.

Thus, mixed models will be fitted to predict the outcome of METs in the form of normalized (z-score) judgments, i.e., the dependent variable, based on several predictors, i.e., independent variables. To this end, the `lmer()` function from the *lme4* package¹⁸ (Bates et al. 2015, 2020) for *R* for Windows is commonly used, which is “[t]he most widely used *R* package for mixed models in the language sciences” (Winter 2020: 238) and allows researchers “to fit a large variety of mixed effects models” (Gries 2009: 334). The *lme4* package was chosen because of its “user-friendly interface, the ability to handle unbalanced data, multiple crossed effects and being very fast even for large data sets” (Kuznetsova et al. 2017: 1-2). Also, *lme4* offers the possibility of carrying out stepwise regressions (see below) in “an automated procedure that selects the best model” (Winter 2020: 276), which makes it particularly appealing to researchers who are still unfamiliar with mixed models.

At this point, it must be conceded that stepwise regression is not entirely uncontroversial. Whittingham et al., for example, note that this method has issues such as “bias in parameter estimation, inconsistencies among model selection algorithms [...] and an inappropriate focus or reliance on a single best model” (2006: 1183). Similarly, Winter criticizes that despite an “appearance of objectivity [...] this approach has a host of problems”, including a susceptibility to “Type I error rates” and “a tendency to overfit” (2020: 277), that is, “when models correspond too closely to the idiosyncratic patterns of particular datasets” (2020: 115). This means that there is “absolutely no guarantee that the final model generalizes well to novel data” (Winter 2020: 277).

Moreover, the specifics of stepwise regression are also debated. Kuznetsova et al. note: “Model selection in general, and selection of regression and ANOVA type models in particular, are controversial topics with many highly opinionated papers in the statistical literature” (2015: 32). However, due to the author’s inexperience with statistical analysis, stepwise regression appeared to offer the best compromise, given the complexity of the datasets that needed to be analyzed and the limited time and resources available at the time of writing. In this sense, a point of criticism about stepwise regression– “desperately trying to limit your choices” (Winter 2020: 276) – actually turned out to be an advantage: It offered “a way of automatically guiding [...] decisions about which model to fit” (Winter 2020: 276).

18 Note that even in the academic literature, it is regularly acknowledged that “[t]he underlying theory of multilevel models is very complicated” (Field et al. 2012: 860), to a point that it is often conceded that it is too complex to comprehend, even for experts (e.g. Field et al. 2012: 860). However, thanks to the *lme4* package for *R*, it is possible to carry out statistical analyses of complex data “without actually needing to know the maths” (Field et al. 2012: 860) – an approach that was also taken with LNRE models (see Baroni and Evert’s (2006) ‘black box’ comment in section 2.1.1.3).

Table 2.5 Syntactic variables investigated in the MET experiments

Syntactic variable	Levels	Test item examples
that-complementizer C1 (THAT_C1)	THAT, NO THAT	<i>The more that he says, the less that I want to say.</i> <i>The less that you practice, the more you struggle.</i>
that-complementizer C2 (THAT_C2)	THAT, NO THAT	<i>The more he is encouraged, the better that he performs.</i> <i>The more you trade, the more you pay taxes.</i>
Asymmetric encoding in C1 (AS_C1)	AS, NO AS	<i>As the price gets higher, then the more tender the meat.</i> <i>As people get richer, the better services they demand.</i>
Asymmetric encoding in C2 (THEN_C2)	THEN, NO THEN	<i>The more stress one experiences, then the more mistakes are made.</i> <i>The more wind turbines are built, the more accidents occur.</i>
Object pronoun extraction in C1 (OBJ_C1)	OBJ, NO OBJ	<i>There are people who the more you encounter __ the more you loathe __.</i> <i>There are relatives who the more you call __ the more you annoy them.</i>
Object pronoun extraction in C2 (OBJ_C2)	OBJ, NO OBJ	<i>This is a woman who the more you date her the more you fancy __.</i> <i>There are folks who the more you visit them the more you like them.</i>

In particular, a method known as stepwise regression will be used “to select one model from the set of all possible models” (Winter 2020: 277). Specifically, the method of ‘backward selection’ (as opposed to ‘forward selection’) will be employed, which appears to be “still quite common in linguistics, especially sociolinguistics” (Winter 2020: 277). This approach, which is also known as the “step-down model-building approach” (Kuznetsova et al. 2017: 8), involves “starting with a full model and iteratively deleting those predictors that are not significant” (Winter 2020: 277).

More specifically, the backward selection approach involves the “construction of a maximal possible model followed by deletion of effects with high p values obeying the principle of marginality” (Kuznetsova et al. 2017: 8, cf. also Kuznetsova et al. 2015: 32). The principle of marginality demands that if interaction effects are found to be significant, “main effects are kept in the model” (Kuznetsova et al. 2017: 13). The point of departure – that is, the ‘full’ or ‘maximal’ model – is a model that “includ[es] all independent variables” (Gries 2009: 260). In other words, a model where “both random and fixed structures contain all possible main and interaction effects” (Kuznetsova et al. 2017: 12). The process of deleting predictors from the maximal model ends “when no predictor can be discarded anymore with making the model too much worse or when no predictors are left in the model” (Gries 2009: 260).

To determine which predictors are significant and which are not during the backward selection process, models are compared using likelihood ratio tests (LRT), which are “widely used” for this purpose (Kuznetsova et al. 2017: 2, cf. also Winter 2020: 260-64). To this end, the `anova()` function in *R* is commonly employed. Note that although the name of this function implies the execution of ANOVA (ANalysis Of VAriance) tests, it “actually performs a likelihood ratio test when applied to mixed models” (Winter 2020: 261). In backward selection, the standard procedure is as follows: Tests are “first applied to the random effect[s], followed by the fixed effects” (Laporte 2019: 271; cf. also Gries 2013: 260-61; Kuznetsova et al. 2015: 32); predictors are first eliminated at the “highest level of interactivity”, upon which the process continues “downwards in the direction of main effects” (Gries 2009: 260). Note that all of these steps – i.e., the testing and, where applicable, elimination of random effects and fixed effects – was carried out automatically by means of the `step()` function from the *lmerTest* package for *R* (Kuznetsova et al. 2015, 2020). This is a function that “automates the step-down approach” (Kuznetsova et al. 2015: 8) using the `lmer()` function from *lme4*.

Importantly, predictors that participate “in a required higher-order interaction” (Gries 2009: 260) cannot be dropped from the model (cf. principle of marginality, discussed above), that is, if in an interaction A:B predictor A is significant and predictor B is not significant, the latter cannot be dropped. This is done “to enhance interpretability of the various fixed effects and tests thereof” (Kuznetsova et al. 2015: 32). Note that the interaction, or crossing, of three factors (in the case of fixed effects) in each model (see below) resulted in complex maximal models. This means that “it may be quite cumbersome to derive p -values for each predictor via likelihood ratio tests” (Winter 2020: 263). Therefore, the *R* package *lmerTest* (Kuznetsova et al. 2015, 2020) was employed, which “builds on top of the *lme4* package” (Kuznetsova et al. 2015: 33) and “can perform automated complex mixed-effects modeling” (Kuznetsova et al. 2015: 31). The package, which “allow[s] to analyze a broad range of mixed effects models in a fast and efficient way” (Kuznetsova et al. 2015: 31) was chosen because “it will do

almost all the model selection work [...] and present the results of the model selection process together with *post hoc* analyses in a [...] user-friendly way” (Kuznetsova et al. 2015: 32), thereby greatly reducing the workload of researchers¹⁹. The *post hoc* analyses carried out by *lmerTest* include “*F*-statistics and *p*-values for each fixed-effects term” (Kuznetsova et al. 2015: 34). Furthermore, *lmerTest* provides the final model in *lme4* syntax, and shows the order of elimination of effects.

Upon completion of the backward selection process, the final models will be tested, based on Laporte’s approach (2019), as follows: First, they will be “compared against a null model, i.e., one that only includes the random effects” (2019: 271)²⁰. This will be done by calculating a so-called “evidence ratio”, which is obtained using the formula $\exp(-(1/2)\Delta)$, where Δ denotes the difference between the Akaike Information Criterion (AIC) of each model (Burnham et al. 2011: 26, see also Wagenmakers and Farrell 2004: 194)²¹. Note that calculating evidence ratios is “a simple alternative to ANOVA tables and *p* values” (Burnham et al. 2011: 32); unlike *p*-values, it is possible to quantify *how much better* a model with minimum AIC (i.e., the final model) is than the alternative (i.e., the null model). This is an advantage over null hypothesis testing, because as Burnham et al. note, “[f]inding little/no support for the null [hypothesis] does little to provide evidence for the alternative [...]”. At best, the *p* value is not a proper strength of evidence.” (2011: 33).

Second, two R^2 values²² will be calculated: a ‘marginal R^2 ’ value, which “characterizes the variance described by the fixed effects”, and a ‘conditional R^2 ’ value, which characterizes the variance described by both fixed and random effects” (Winter 2020: 264). This is done “to determine how much of the variance in the data the model accounts for” (Laporte 2019: 271), where “[l]arger residuals yield smaller R^2 values” (Winter 2020: 76). Once these tests are completed, the significant effects can be examined to see (1) whether there are any “systematic syntactic idiosyncrasies” (Laporte 2019: 271) and (2) whether there are any variety-specific effects. The results of these tests, as well as the full and final models, are shown in sections 5.1-5.3 of the appendix.

In total, three stepwise regressions, one for each experiment, were thus carried out on the following maximal models, that is, models “where the fixed and random parts contain all explanatory variables and as many interactions as possible” (Kuznetsova et al. 2015: 33):

1. That-complementizers:

Z_SCORE ~ THAT_C1*THAT_C2*VARIETY + (1|SUBJECT) + (1|MS) + (1|LEXICALIZATION)

2. Asymmetric encoding:

Z_SCORE ~ AS_C1*THEN_C2*VARIETY + (1|SUBJECT) + (1|MS) + (1|LEXICALIZATION)

3. Object pronoun extraction:

Z_SCORE ~ OBJ_C1*OBJ_C2*VARIETY + (1|SUBJECT) + (1|MS) + (1|LEXICALIZATION)

The formulas above correspond to the *lme4* syntax, where the first part of the formula is the dependent variable, or outcome, i.e., the z-score (Z_SCORE). It is separated from the

¹⁹ See Kuznetsova et al. (2015: 33-34) for a detailed account of how *lmerTest* operates.

²⁰ A null model is thus “an intercept-only model because there are no other predictors” (Winter 2020: 185).

²¹ The higher an evidence ratio is, the stronger the evidence for the final model (i.e., that which is the result of the stepwise regression) is.

²² Note that “[l]arger residuals yield smaller R^2 values” (Winter 2020: 76) – i.e., the smaller the R^2 value, the less a model accounts for the variance in a data set (cf. also Laporte 2019: 271).

independent variables (i.e., the predictors) by a tilde. This indicates that the fixed effects (e.g. THAT_C1, THAT_C2 and VARIETY) are modeled as a function of the z-score (Z_SCORE), followed by the random effects SUBJECT, MS (material set), and LEXICALIZATION. As per the *R* documentation, “[t]he * operator denotes factor crossing: a*b interpreted as a+b+a:b” (R Core Team 2020b) so that the formula THAT_C1*THAT_C2*VARIETY²³ means that the fixed effects factors are crossed, allowing for all possible interactions between them to be tested.

The random effects (SUBJECT, MS, and LEXICALIZATION) are “simple additive shift[s]” (Bates 2005: 28). In the *lme4* syntax, “the vertical ‘|’ bar inside the brackets can be paraphrased [...] as ‘conditioned on’ or ‘relative with respect to’” (Winter 2020: 238, cf. also Bates 2005: 27), such that the random effects are specified by “a linear model term and a grouping factor separated by ‘|’” (Bates 2005: 27). The ‘|’ symbol (often referred to as ‘pipe symbol’) is an operator with a lower precedence than other operators, which is why “the entire random-effects expression [is] enclosed in parentheses” (Bates 2005: 28). Put in simpler terms, the expression ‘(1|SUBJECT)’ tells *lme4* to “estimate by-participant varying intercepts because ‘1’ acts as a placeholder for the intercept” (Winter 2020: 238). Note that when using the `lmer()` function from the *lme4* package, “nested and non-nested grouping factors are expressed in exactly the same way” so that it is sufficient to simply “provide multiple random-effects expressions and the determination of nested or non-nested is done in the code” (Bates 2005: 30). On a final note, the models specified above do not account for varying slopes. This is because fitting models with varying slopes (on top of varying intercepts) “quickly leads to massively overspecified models that are bound to have convergence issues” (Winter 2020: 277), as first attempts at fitting such models for the MET data sets in *R* revealed. Thus, it was decided to disregard slopes, although it is acknowledged that this comes with the risk that “estimates may be anti-conservative” (Winter 2020: 277).

2.2 Analyzing language with a World Englishes approach

Apart from Usage-based Construction Grammar, the present investigation is also embedded in a theoretical strand that is commonly referred to as *World Englishes*, with a focus on Schneider’s (2003, 2007) Dynamic Model (see chapter 1.3). As discussed above, the present study seeks to bring together theoretical and empirical strands, with the aim of bridging the “gap between theoretical and statistical modelling” (Hundt 2021: 298). Thus, it is necessary to briefly elaborate on how the strand of methodology presented in section 2.1 ‘weaves’ in to the theoretical strand of the Dynamic Model, which assumes that “varieties of English in postcolonial contexts have typically followed an underlying, fundamentally uniform evolutionary process” (Schneider 2011: 33), and are “products of a specific evolutionary process tied directly to their colonial and postcolonial history” (Schneider 2007: 3). This assumption makes it possible to analyze and compare World Englishes in the first place, and has led to a proliferation of empirical investigations in recent years, with a specific focus on the Nativization stage (III) of the Dynamic Model. As has already been touched upon in chapter 1 (section 1.3), from a syntactician’s perspective, this is perhaps the most interesting stage of the model (Schneider 2007: 83, emphasis JH):

23 That is: THAT_C1 + THAT_C2 + VARIETY + THAT_C1:THAT_C2 + THAT_C1:VARIETY + THAT_C2:VARIETY + THAT_C1:THAT_C2:VARIETY.

Innovations and *distinctive structural properties of PCEs* are frequently positioned *at the interface between lexis and grammar*, i.e. certain words but not others of the same word class prefer certain grammatical rules or patterns. The patterns as such are not new, nor are the words, but what is novel is the habitual association between them in specific varieties.

What is of particular relevance in this context is the assumption that there is a “correlation between linguistic predictors and structural effects” which are “essentially probabilistic in nature” (2007: 22). As Hundt notes, this means that researchers can assume the existence of specific rules “across varieties that are amenable to statistical modelling” (2021: 306), and that these rules correlate with the phases of Schneider’s Dynamic Model. This has been demonstrated before: Hoffmann, for example, concludes in the context of his ICE corpus study on CC slot productivity that “[English] varieties exhibit similar processing effects, but differ greatly with respect to their reliance on partly substantive, partly schematic meso-constructions” (2014b: 160). More specifically, Hoffmann was able to confirm the prediction that “PCEs that are still in the Nativization Phase of the Dynamic Model will rely more on specific meso-constructions [...] since it is this constructional level at which innovations are supposed to take place” (2014b: 171-2).

In essence, Hoffmann thus provided empirical evidence of a correlation between DM stage and phenomena at the lexis-syntax interface. In a similar vein, Brunner and Hoffmann showed in the context of their empirical analysis of the *way*-construction based on GloWbE corpus data that there is a “correlation of Dynamic Model stage [...] and constructional productivity”, where “the less entrenched a variety is according to the Dynamic Model, the stronger is its tendency to select specific prototypical, or frequent, fillers in the constructional slots” (2020: 1).

However, as Schneider notes, there are only “a few cases” of studies that “explicitly test claims made in the Dynamic Model on empirical ground” (2014: 14). These studies²⁴ do not only demonstrate that the ‘gap’ between theory and statistical modeling (cf. Hundt 2021) can and needs to be bridged, they also prove that Schneider’s Dynamic Model and the predictions it entails can be tested and confirmed using state-of-the-art methodological approaches, including those employed for the present investigation.

2.3 Corpus data

As discussed in section 2.1.1, the present study relies on three large corpora of English: COCA, BNC, and GloWbE. Access to the offline versions of these corpora was provided through a research project that was generously funded by the German Research Foundation (DFG HO 3904/5-1). Most of the corpus queries were carried out in the context of this research project by my esteemed colleague Thomas Brunner at the Catholic University of Eichstätt-Ingolstadt, to whom I express my sincere gratitude.

In the following, a brief overview of these corpora will be provided, including information on how they were queried (sections 2.3.1.1-2.3.1.3).

24 See Schneider’s list of studies (2014: 14-15) for a comprehensive overview.

2.3.1 Corpora used

2.3.1.1 The British National Corpus

Released in the early 1990s (Davies 2009: 159), the BNC is the oldest of the three corpora used in the present study. Its size of 100 million words was revolutionary at the time of its composition, but it pales in comparison with modern corpora such as COCA, which is more than five times as large (see section 2.3.1.2). BNC was composed to “characterize the state of contemporary British English” (Aston and Burnard 1998: 28), i.e., its creators tried to make it as representative as possible, as is also evident from the wide range of different genres from which texts were sampled (cf. Aston and Burnard 1998: 31). As has been discussed in section 2.1.1, the composition of BNC inspired that of COCA, so they can be considered more or less comparable, even though BNC has not seen any “substantive additions” (Davies 2009: 159) since 1993, and is thus slowly becoming outdated. In this sense, BNC differs from COCA in that it is more of a synchronic ‘snapshot’ of the language rather than a diachronic monitor corpus (see section 2.3.1.2).

Most of the individual text samples in BNC consist of roughly 50,000 words, with the ‘spoken demographic texts’ category containing “rather longer” samples, whereas the ‘written unpublished materials’ category contains “very short” texts (Aston and Burnard 1998: 28). Furthermore, the BNC consists of about 10% spoken and 90% written material (Aston and Burnard 1998: 31). In the following, this distinction will be referred to as ‘mode’, based on Biber and Conrad’s terminology (2009: 31). This is another way in which BNC differs from COCA, which contains about 20% spoken texts. Finally, while the text types in COCA are “evenly divided” into five categories, or registers, BNC is less balanced in this respect. In addition to the spoken component of 10%, about 16% comes from fiction, 15% from magazines, 10% from newspapers, and 15% from academic, among others (Davies 2009: 161).

The present study is based on the same data from an offline version of BNC1994²⁵ that was used in a previous study by Hoffmann et al. (2020). The query (see also Hoffmann et al. 2020: 202) was carried out using two separate regular expressions, composed by the author’s colleague, Thomas Brunner, using the CLAWS5 tag set:

- **C1C2 order:**
“the” [pos = “AJC” | (pos = “AV0” & word = “. + er”) | word = “more|less|worse”] [*] [pos = “AJC” | (pos = “AV0” & word = “. + er”) | word = “more|less|worse”] [*] within s
- **C2C1 order:**
[pos = “AJC” | (pos = “AV0” & word = “. + er”) | word = “more|less|worse”] [0,5] [word = “the”] [pos = “AJC”|(pos = “AV0” & word = “. + er”)|word = “more|less|worse”] within s

This query yielded 3,665 potential C1C2 and 591 potential C2C1 tokens (cf. Hoffmann et al. 2020: 202), which were manually checked for false positives by a team of five student assistants. They discarded the false positives, together with tokens that contained deleted text (see section 2.1.1), leaving a data set of 2,041 C1C2 and 139 C2C1 tokens. Throughout the

25 All examples cited in this study as having been retrieved from ‘BNC’ have been extracted from the British National Corpus, distributed by the University of Oxford on behalf of the BNC Consortium. All rights in the texts cited are reserved.

2.3.1.3 The Corpus of Global Web-Based English

Consisting of 1.9 billion words (cf. Davies and Fuchs 2015), GloWbE²⁷ is massive, even by the standards of other large corpora such as BNC (100 million words) and COCA (520 million words in the version used in this study). What makes it particularly useful in the context of the present investigation is that the texts contained in GloWbE are sampled from “1.8 million web pages from 20 different English-speaking countries” (Davies and Fuchs 2015: 1), allowing a comparison across varieties of English from all DM stages except stage I. A drawback, however, is that BNC and COCA do not include internet-based sources (cf. Davies 2009: 162), which could be argued to affect comparability in the context of the present study (see below). However, for want of better alternatives, it was decided to rely on GloWbE, which does contain British English and American English components that can also be used for comparisons.

Based on Brunner and Hoffmann (2020)²⁸, the GloWbE varieties were classified into DM stages II to V “based on the parameters outlined in Schneider 2007” (2020: 3). Table 2.6 gives an overview of the 19 GloWbE varieties with their two-letter code and word counts (cf. Davies and Fuchs 2015: 6), as well as the stages of the Dynamic Model to which they have been assigned, with British English serving as a reference variety²⁹.

GloWbE differs from the other two corpora employed in the present investigation, BNC and COCA, in that it consists entirely of texts obtained from web pages. This means that although GloWbE has been compiled to consist of roughly 60 per cent texts from “informal blogs, and the rest from a wide range of other genres and text types”, apparently in an attempt to reflect the 60 per cent spoken vs. 40 per cent written composition of the ICE corpora (cf. Davies and Fuchs 2015: 2), it cannot be considered fully comparable with BNC and COCA, which have been compiled from sources that differ considerably from web content. Nevertheless, GloWbE was created with three goals, “size, genre balance (including informal language), and accuracy in terms of identifying the dialect that it is representing” (Davies and Fuchs 2015: 3), and is thus considered an adequate source of data for the present study.

Another issue with GloWbE is the size of its components. As has been discussed in section 2.1.1, the largest components (AmE and BrE) are roughly ten times as large as the smallest ones (TanzE and GhE), which is why the statistical tests outlined in sections 2.1.1.1 and 2.1.1.2 had to be employed to compensate for this difference in size. Despite these caveats, GloWbE is an indispensable resource, having been described as an “important part of researchers’ ‘toolbox’ of resources for studying World Englishes” by its compilers (Davies and Fuchs 2015: 3).

27 <https://www.english-corpora.org/glowbe/> (accessed 24 Nov 2020)

28 Unlike Brunner and Hoffmann, who classified South African English as a stage V variety, it is treated as a stage IV variety in the present corpus study, following what appears to be a general trend in the literature – Schneider himself describes SAfE as having “made deep inroads into phase 4” (2007: 188) and Spencer has claimed that SAfE is moving “towards [stage] IV” (2011a: 270). Similarly, van Rooy and Terblanche note that “there is clear evidence of the emergence of [stage IV] in South African English” (2010: 407). Note that ethnicity was taken into account in the MET experiments, so that a more detailed picture could be painted (see chapter 5 for further discussion).

29 Following Hoffmann’s convention, in HCFA and Covarying-collexeme analyses BrE will be “included in the list of Stage V varieties” “due to its advanced evolutionary state” (2019: 224).

Table 2.6 Classification of GloWbE varieties according to DM stages (based on Hoffmann and Brunner 2020: 3), with codes and word counts (based on Davies and Fuchs 2015: 6)

DM stage	Code	Variety	Words
Reference variety V (Differentiation)	GB	British English	387,615,074
	US	American English	386,809,355
	CA	Canadian English	134,765,381
	IE	Irish English	101,029,231
	AU	Australian English	148,208,169
	NZ	New Zealand English	81,390,476
IV (Endonormative stabilization)	SG	Singapore English	42,974,705
	ZA	South African English	45,364,498
	JM	Jamaican English	39,663,666
III (Nativization)	PH	Philippine English	43,250,093
	MY	Malaysian English	42,420,168
	IN	Indian English	96,430,888
	KE	Kenyan English	41,069,085
	TZ	Tanzanian English	35,169,042
	NG	Nigerian English	42,646,098
	HK	Hong Kong English	40,450,291
	LK	Sri Lanka English	46,583,115
	GH	Ghana English	38,768,231
II (Exonormative stabilization)	BD	Bangladeshi English	39,658,255
	PK	Pakistani English	51,367,152

For the present study, an offline version of GloWbE was queried using the following regular expressions (note that this is in R syntax) that were composed by the author's colleague Thomas Brunner:

- **C1C2 order:**

```
CURRENT_RESULT <- exact.matches("the_at (\\w+?(\\d\\w@)*)*(j|j|j|rrr|dar|rgr)[@%]?
(\\d\\w@%+)*\\blesser_\\d\\w+).+?(\\w+?(\\d\\w@%+)*_(j|j|j|rrr|dar|rgr)[@%]?(\\d\\w@%+)*\\blesser_\\d\\w+", as.vector(CURRENT_SENTENCES[[1]]), case.sens=F)[[4]]#
```
- **C2C1 order:**

```
CURRENT_RESULT <- exact.matches("(?!the_at)(\\b\\w+?(\\d\\w@%+)*_(j|j|j|rrr|dar|rgr)[@%]?(\\d\\w@%+)*\\blesser_\\d\\w@%+)(\\w+_\\w\\g@%+){0,5} (?!_if)(?!_iw)(?!_io)(?!_ii)(?!than_csn)\\bthe_at (\\w+?(\\d\\w@%+)*_(j|j|j|rrr|dar|rgr)[@%]?(\\d\\w@%+)*\\blesser_\\d\\w+", as.vector(CURRENT_SENTENCES[[1]]), case.sens=F)[[4]]
```

With this query, 101,055 potential C1C2 tokens were extracted, from which a random sample of 10,000 tokens was drawn by the author's colleague Thomas Brunner using a custom script of his. This sample was stratified to account for the difference in size of each

variety's component. Figure 2.1 illustrates the proportion that each variety contributed to the total of 10,000 (uncoded) tokens.

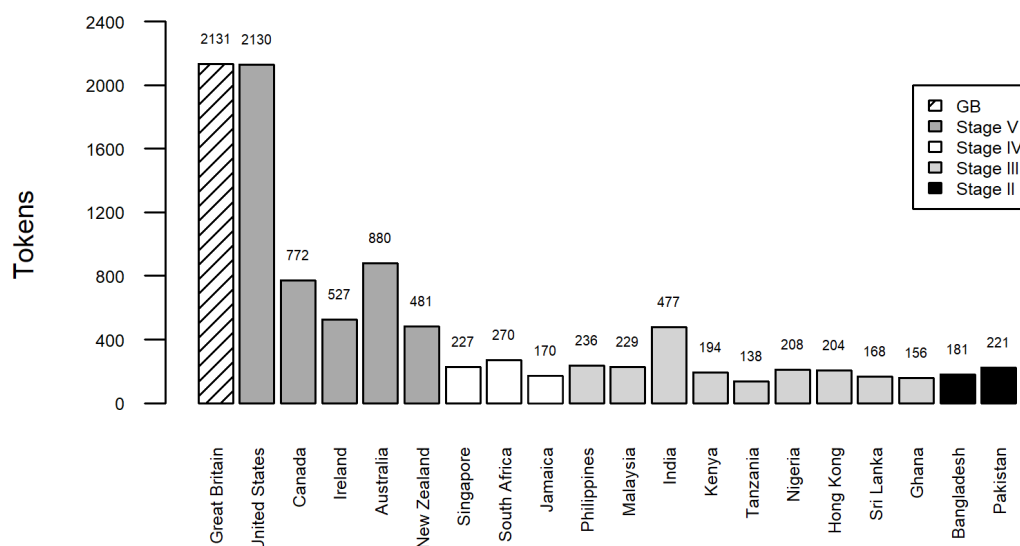


Figure 2.1 Uncoded tokens in the 10,000-token stratified random sample extracted from GloWbE, by variety

With the second regular expression, all potential C2C1 tokens from across all varieties were extracted, resulting in a data set of 6,873 tokens. Note that this number represents *all* potential C2C1 tokens that Thomas Brunner's script (see above) extracted, while the data set with potential C1C2 tokens is a stratified random sample of 10,000 tokens, because the original 101,055 tokens were simply too much to be coded. This means that the two data sets cannot be used to make any statement about the proportion of C2C1 vs. C1C2 structures, at least not in comparison to the BNC and COCA data (see section 4.2.1).

Subsequently, the data was manually checked and coded by student assistants, following the same procedure that was employed for the BNC and COCA data sets (i.e., using the same training and the same coding handbook). Originally, it was intended to exclude the GB and US components, since those varieties were already covered by the BNC and COCA corpus studies. However, it turned out that the student assistants had more time than planned at their disposal, so that it was possible to code the GB component (2,131 tokens) of the C1C2 data set as well. After the coding was completed, there were thus two data sets consisting of 5,715 C1C2 tokens and 904 C2C1 tokens. The C1C2 data set contained 539 'stacked' C1C2C3... tokens and likewise, the C2C1 data set contained 34 'stacked' tokens in addition to the 904 C2C1 tokens. Figure 2.2 provides an overview of how many tokens each GloWbE variety contributes to the total count of C1C2 tokens; Figure 2.3 shows how many tokens each variety contributes to the total count of C2C1 tokens:

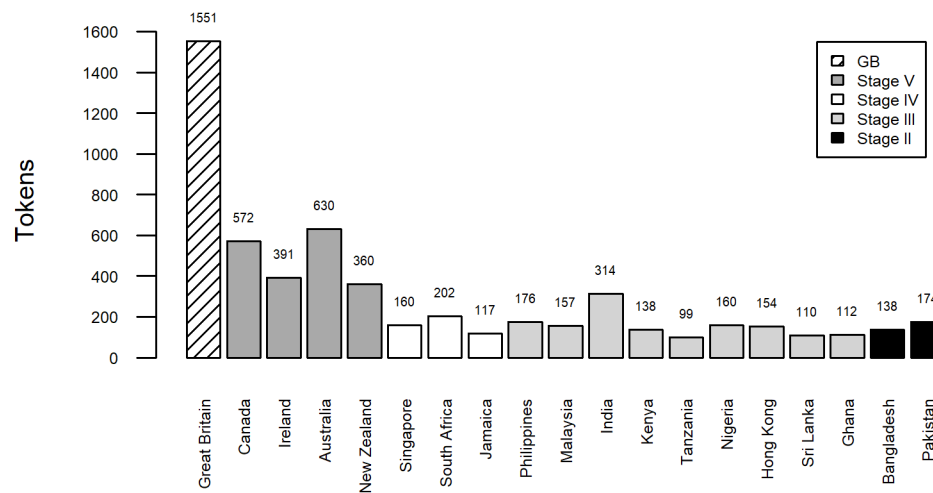


Figure 2.2 C1C2 tokens by GloWbE variety

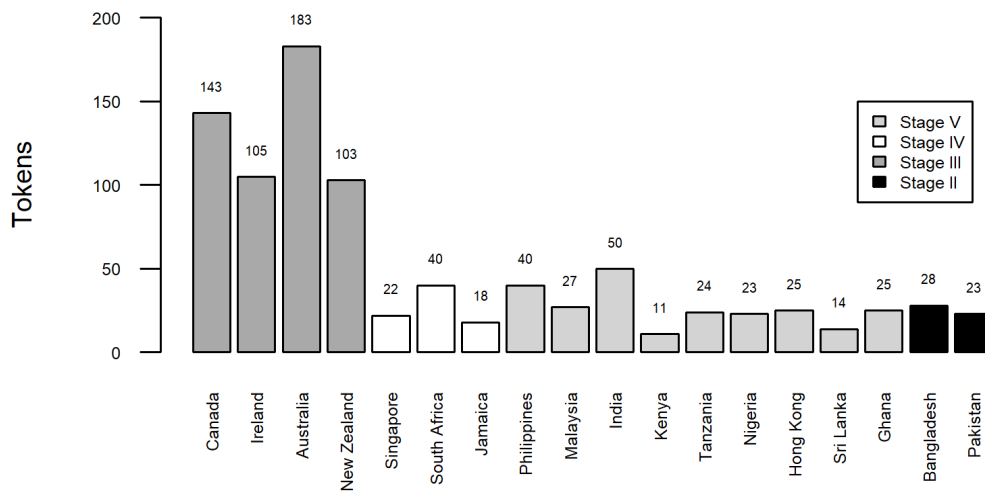


Figure 2.3 C2C1 tokens by GloWbE variety

Examples that were retrieved from GloWbE using the above regular expressions are cited as follows:

Example citation: (GLOWBE- AU wlp_au_kso/wlp_au_g01 blog ##676903 Line: 25)

Meaning: Variety code (see Table 2.6 above) File name Register (blog or general, see above) Text ID Line in the text file

2.4 Software used

2.4.1 Data handling and coding: *Libre Office*

All data was handled using the spreadsheet component of LibreOffice, *Calc*, in its most recent version. In the case of the corpus data, these were extracted by Thomas Brunner with an *R* script and then automatically saved in a CSV file, which already contained the following columns:

- Corpus metadata³⁰ (automatically extracted):
 - ID
 - FILE NAME (COCA and GloWbE) / TEXT NAME (BNC)
 - TEXT_ID (COCA and GloWbE) / S_UNIT_NUMBER (BNC)
 - LINE
 - YEAR
 - REGISTER (COCA)
 - VARIETY (GloWbE only)
 - RANDOM_ORDER_ACCORDING_TO_RANDOM_SAMPLE (only where a random sample was drawn, i.e., COCA and GloWbE)
- Text passages: LEFT_CONTEXT, HIT, RIGHT_CONTEXT, where HIT contained the C1 clause
- RELEVANCE (manually coded by the student assistants)
- Syntactic variables (automatically extracted, but manually checked by the student assistants):
 - LEXICAL_FILLER_C1, LEXICAL_FILLER_C2
 - FILLER_TYPE_C1, FILLER_TYPE_C2
 - PRESENCE_THAT_C1, PRESENCE_THAT_C2
 - SUBJ_AUX_INV_C1, SUBJ_AUX_INV_C2
 - DELETION_C1, DELETION_C2
 - THE_IN_C2 (only relevant for CC' constructions, see section 3.2.1)
 - ORDER

Furthermore, an INTERNAL_ID and a COMMENT column were added manually; the former with a unique ID number for each hit so that the research team could communicate and navigate more efficiently, and the latter so that the student assistants could notify the researcher about ambiguous or simply interesting cases.

The data from the psycholinguistic experiments were entered into spreadsheets by the team of student assistants, who had received extensive training on e.g. how to calculate the z-scores (see section 2.1.2). The spreadsheets were then checked once more by the author to make sure everything was in order.

2.4.2 Data storage: *FAUbox*

To ensure the secure storage of data obtained in the context of the MET experiments, it was decided to store all project-related files³¹ in a cloud storage facility called *FAUbox* that is hosted by the computing center of Friedrich-Alexander University in Erlangen-Nürnberg,

³⁰ In the case of BNC, more corpus metadata than listed here was extracted (e.g. GENRE, MEDIUM_OF_TEXT, AGE_OF_AUTHOR). However, including these data in the analysis would go beyond the scope of the present study, which is why they were not taken into account.

Germany (<https://faubox.rrze.uni-erlangen.de/>). This is a free-of-charge non-commercial service that was designed specifically for storing sensitive data obtained in the context of scientific research. The *FAUbox* client, which automatically synchronizes files, was developed to have the same functionality as other cloud-based services such as *Dropbox*. However, *FAUbox* stores data on secure servers at the computing center of Friedrich-Alexander University in Erlangen, Germany.

The client was installed on all machines used by the research project (i.e., two student assistant computers and the author's laptop). Access to these computers was available with a password that was only known to the members of the project team to ensure maximum safety of the data. Using *FAUbox* also had several advantages regarding the general workflow of the project: It ensured backup copies of all files in case a file was accidentally deleted, and it greatly facilitated the exchange of data between the student assistants and the author, especially when the experiment questionnaires were scanned on-site. They were directly uploaded to the secure cloud, so that the student assistants could immediately begin entering the data into spreadsheets.

2.4.3 Data analysis: *R* for Windows

To analyze the data sets obtained from corpora and experiments, *R* for Windows (R Core Team 2020a) was used. This is an open-source program in which scripts such as Gries' *HCEA* 3.2 (2004) and *Coll.analysis* 3.2a (2007), as well as the *lme4* package (Bates et al. 2015, 2020) can be executed. Apart from being free of charge, *R* also has the advantage of being well-documented; as Hoffmann notes, there is "a number of great introductory textbooks on statistics with R for linguists" (2011: 19). Textbooks that were consulted in the context of the present study include Faraway (2006), Baayen (2008), Gries (2008; 2009; 2017), Field et al. (2012), Friendly and Meyer (2016), and Winter (2020). To facilitate work with *R*, the desktop application version of *RStudio* (RStudio Team 2020) was used. This is an open-source integrated development environment (IDE) that "includes a console, syntax-highlighting editor that supports direct code execution, as well as tools for plotting, history, debugging and workspace management" (<https://rstudio.com/products/rstudio/>, accessed 24 Mar 2021).

31 Following ethics guidelines, no personal data of the subjects who participated in the MET experiments was stored digitally – the signed consent forms (on paper) were archived in a secure location at the Catholic University of Eichstätt-Ingolstadt.

3 Phenomena under inspection

It seems, then, that the CC construction consists of a subordinate clause and a main clause.

Borsley (2004: 75)

[There is] clear evidence that supports our claim that the central properties of Modern English CCs are paratactic, not hypotactic.

Hoffmann et al. (2020: 213)

In chapter 1, it was shown that the Comparative Correlative construction combines complex semantics with complex form. In fact, CCs exhibit so many idiosyncrasies regarding their formal properties that they have attracted interest for over three decades now, resulting in a large number of introspective and corpus studies¹. From mildly frequent phenomena such as *that*-complementizers and subject-auxiliary inversion (SAI) to high-frequent features such as cross-clausal associations, research has repeatedly turned up surprising findings, prompted new research questions, and led to disputed claims.

As was discussed in section 1.2, the subclauses of the CC construction encode a conditional asymmetric cause-effect relationship coupled with a symmetric parallel change over time. In line with the principle of iconicity (Bybee 2012: 529), which posits that the meaning carried by constructions is mirrored in their form, we can thus expect competition between asymmetric and symmetric formal features. In this regard, one of the most common disputes in the literature is concerned with the question whether CCs are paratactic (i.e., symmetric) or hypotactic (i.e., asymmetric) structures. As will be discussed in this chapter, in various studies evidence of either view has been brought forward. However, despite repeated claims in introspective investigations that “[t]here is evidence [...] that the first clause [C1] is a subordinate clause and the second [C2] a main clause” (Borsley 2004: 74), recent corpus investigations (e.g. Hoffmann 2019; Hoffmann et al. 2019; 2020) have provided empirical evidence suggesting that while they are not ungrammatical, hypotactic features in CCs are infrequent and disfavored phenomena, and have to be evaluated as historical remnants from earlier stages of English, when CCs were considerably more hypotactic².

The approach taken in the present study is that instead of a paratactic-hypotactic dichotomy, there is more of a continuum³ with hypotaxis and parataxis as the extremes, along which CC constructions of different languages can be found, reflecting the competition between asymmetric and symmetric formal features. In this respect, the PdE English CC construction can be placed quite close to the parataxis pole (evident from the nature of its meso-constructional network), but as the various hypotactic remnants discussed here show, not at the full extreme. As will also be discussed, there is evidence that suggests that some PCEs deviate from the standard varieties in this respect.

The main object of interest of the present study are thus the formal idiosyncrasies of the CC construction in English, and their variation among World English varieties. The aim,

1 For an overview, see chapter 1.

2 For a comprehensive overview of the diachronic evolution of the CC construction in English from hypotactic in OE to overwhelmingly paratactic in PdE, see Hoffmann (2019, ch. 3).

3 Following Hoffmann’s observation that “C1C2 constructions are not straightforwardly classified as either hypotactic or paratactic structures.” (2019: 45)

following the research questions (see section 1.5), is to test previous claims, address unresolved disputes in the literature, and corroborate previous small-scale corpus studies, whose small data sets of around 150 CC tokens have raised “serious questions concerning the validity” of their results (Hoffmann et al. 2019: 7). A further goal is to improve our knowledge of the English CC constructional network, in particular at the meso-constructional level, and to compare findings about formal properties between English varieties to determine whether they correlate with Dynamic Model stages. To this end, various idiosyncratic formal features of the English CC construction will be examined: Section 3.1 is concerned with hypotactic features (*that*-complementizers (3.1.1), subject-auxiliary inversion (3.1.2), and object pronoun extraction (3.1.3)), section 3.2 with clause order (i.e., the ‘reversed’ C2C1 order (3.2.1) and ‘stacked’ C1C2C3 constructions (3.2.2)), and section 3.3 with cross-clausal associations concerning lexical fillers (3.3.1), filler types (3.3.2), and deletion and truncation phenomena (3.3.3). In section 3.4, slot productivity will be discussed, and in section 3.5, prototypical fillers, two linguistic variables that have previously been discussed in the context of the *way*-construction (Brunner and Hoffmann 2020). Finally, section 3.6 is concerned with the asymmetric encoding in non-standard varieties.

3.1 Hypotactic features

One of the most hotly debated features of CCs is the syntactic relationship between C1 and C2. While in other languages, this is quite unambiguous – German, for example, encodes C1 as subordinate clause and C2 as main clause using word order (Hoffmann 2018: 185-86) – in English, the matter is not so clear. Thus, there are various formal features of the CC construction that have been argued to “have direct relevance for the question whether PdE CCs have a more hypotactic or paratactic structure” (Hoffmann 2019: 53), including optional *that*-complementizers in C1 (section 3.1.1), which will be investigated based on corpus data and psycholinguistic experiments, and optional SAI in C2⁴ (section 3.1.2), which will be subjected to a corpus analysis. In the following, these hypotactic features of the English CC construction will be discussed in more detail.

On top of that, so-called across-the-board extraction (ATB), i.e., the simultaneous extraction of object pronouns from both C1 and C2 (section 3.1.3) has been cited as proof of “paratactic (i.e., quasi-coordinate) syntax” in CCs (Culicover and Jackendoff 1999: 567). This is the perspective also assumed in the present investigation, in line with Hoffmann et al.’s claim that “English CCs possess more paratactic than hypotactic features” (2020: 196), the latter of which are merely “historical remnants” that “are no longer central properties of the construction” (Hoffmann et al. 2020: 200).

3.1.1 *That*-complementizers

There are differing opinions in the literature regarding *that*-complementizers, which are generally described as optional in C1 (3.1):

4 Other evidence for the main clause status of C2 comes from the possibility of “mandative subjunctives in suitable embedded contexts” (Hoffmann 2019: 46; referring to Culicover and Jackendoff 1999: 558) and tag questions (Borsley 2004: 74). These features, however, have not been included in the present study, as they did not lend themselves well to a corpus study.

- (3.1) [*The more [that]_{that-complementizer} you read,*]_{C1} [*the more things you will know.*]_{C2}
 [*The more [that]_{that-complementizer} you learn,*]_{C1} [*the more places you'll go.*]_{C2}
 (Dr. Seuss, *I Can Read With My Eyes Shut!*)

Such *that*-complementizers have been described as an “unusual feature” because they are not possible in other filler-gap constructions such as *wh*-interrogatives, exclamatives and relative clauses (Borsley 2004: 73). This suggests that they are actually a construction-specific idiosyncrasy that, much like subject-auxiliary inversion (see section 3.1.2 below), must be stored separately in the mental constructional network of speakers.

That-complementizers have often been cited as proof of the subordinate status⁵ of the C1 clause, implying a hypotactic relationship between C1 and C2 (as claimed by e.g. den Dikken 2005: 502). However, recent corpus studies have provided strong evidence against this claim, arguing instead that even though diachronically, there was an “optional *that*-complementizer [...] in C1 in earlier stages of English” (Hoffmann 2019: 47), the clause has “lost its subordinate characteristics” (Hoffmann 2019: 138). In these corpus studies, *that*-complementizers have consistently been found with a frequency of less than 2%. For example, Hoffmann found only two instances of *that*-complementizers in his data set of 149 C1C2⁶ tokens ($2/149 = 1.34\%$) from the BROWN corpus family, “both of which appear in C1” (2019: 106). On top of that, there are two more recent large-scale corpus studies based on COCA (Hoffmann 2019) and BNC (Hoffmann et al. 2020) that also suggest that *that*-complementizers in C1 are an “extremely rare” phenomenon (Hoffmann 2019: 124). In Hoffmann’s COCA study, only 24 out of 1,409 C1C2 tokens ($24/1,409 = 1.7\%$) had *that*-complementizers in C1 clauses and likewise, Hoffmann et al.’s BNC study, which was based on a 2,041-token C1C2 data set, could retrieve no more than 29 tokens with C1 *that*-complementizers ($29/2,041 = 1.42\%$), concluding that “*that*-complementizers are used only marginally [in PdE]” (2020: 205).

While these findings are certainly significant and interesting, they are based on data from the standard varieties, BrE and AmE. Hoffmann did conduct an ICE study that included CC tokens from 12 World Englishes⁷, drawing the conclusion that “*that*-complementizers are [...] strongly disfavoured across all [English] varieties”, and that “this effect is even more pronounced in Stage IV and V varieties” (2019: 208), but this investigation was based on a relatively small data set, with only six C1 *that*-complementizer tokens (out of a total of 352 C1C2 tokens) across all ICE varieties. Thus, the question remains largely unanswered whether C1 *that*-complementizers can also be considered a feature of the non-standard varieties, and whether there are variety-specific or DM stage-specific differences. These are questions that the present study will address by means of a large-scale corpus investigation

5 Note that some sources use slightly different terminology for essentially the same concept; den Dikken, for example, refers to “subclause” and “headclause” (2005: 510).

6 As noted by Hoffmann et al. (2020), *that*-complementizers and SAI are features that are of interest only in the C1C2 order. This is because in C2C1 structures, neither SAI ([**Will we be (the) happier*]_{C2} [*the more we get together.*]_{C1}) nor *that*-complementizers ([**That we'll be (the) happier*]_{C2} [*the more we get together.*]_{C1}) are permitted (examples from Hoffmann et al. (2020: 199), emphasis JH). Also note that parts of the C1C2 data sets analyzed in chapter 4 will also not be included in statistical analysis for these features, since “SAI is only possible if BE is retained,” and “[*t*]*hat*-complementizers are only relevant for full clauses” (Hoffmann et al. 2020: 203).

7 BrE, CanE, IrE, NZE (stage V); JamE and SingE (stage IV); HKE, IndE, KenE, NigE, PhilE, TanzE (stage III) (Hoffmann 2019: 208).

and psycholinguistic experiments (see chapters 4 and 5), on top of testing claims about *that*-complementizers being “no longer central properties of the English CC construction” (Hoffmann et al. 2020: 213).

The latter claim will also be tested, using covarying-collexeme analysis, by taking into account the registers of COCA and the written/spoken distinction in BNC – as Lange and Leuckert have noted there is a “huge potential of looking separately at spoken and written registers” (2020: 131). This is because spoken language differs fundamentally from written language in terms of the contexts in which it is produced. As noted by Biber and Conrad (2009: 43), the situational characteristics of these two modes of language production are very different. While spoken language is produced in real time, such that “[t]he speaker usually does not have time to carefully plan what he will say next”, in written language production “[t]he writer has as much time as needed to plan exactly what she wants to write” (Biber and Conrad 2009: 43). We can thus assume that spoken language, being unplanned and spontaneous, is a better indication of which constructions are still readily used by speakers ‘on-line’ and thus, really entrenched as a part of the mental network. This is based on the assumption that in a conversation, when speakers have no time to weigh their options, they will most likely use the more frequent, that is, the more entrenched alternative. This, given previous research, should be structures *without that*-complementizers. The same can be assumed for other low-frequency phenomena such as SAI (see section 3.1.2 below).

Opinion in the literature is also divided on the question whether *that*-complementizers are possible in C2 (3.2).

- (3.2) [*the larger the new settlement becomes*]_{C1}
 [*the less [that]_{that-complementizer} the reduced number of sites you will have available.*]_{C2}
 (BNC S_pub_debate HVK, from Hoffmann et al. 2020: 204)

Regarding *that*-complementizers in C2, den Dikken states that they are possible in both C1 and C2 “in present-day colloquial registers” (2005: 502). In the same vein, Culicover and Jackendoff claim that “the complementizer *that* can occur in either [sub]clause, perhaps with a sense of a more colloquial register” (1999: 546), and Hoffmann notes that “colloquial PdE apparently licenses an optional *that* in both C1 and C2” (2019: 47, also referring to Fillmore et al. 1988: 508). An important point that Hoffmann makes in this regard is that a *that*-complementizer in C2 (in combination with one in C1) “mak[es] the two clauses appear more symmetrical”, implying that such a structure is more paratactical.

C2 *that*-complementizers have been attested in corpora (see example above), but they are even less frequent than their C1 counterparts, a tendency that is also expected to assert itself in the corpus study of the present investigation (see chapter 4). In his BROWN corpus study, Hoffmann could not find any *that*-complementizers in C2 (2019: 106), and in his COCA study, no more than six C2 *that*-complementizers, out of a total of 1,409 C1C2 tokens. Similarly, Hoffmann et al.’s BNC corpus study yielded just two tokens containing *that*-complementizers in C2, out of a total of 2,041 C1C2 tokens. These two instances were found in the ‘spoken’ component of BNC, leading Hoffmann et al. to speak of “(albeit limited) evidence that if *that*-complementizers appear in C2 at all, they do so in spoken English” (2020: 205), in support of Hoffmann’s earlier claim that *that*-complementizers in C2 are restricted to colloquial English (see above). In any case, the very low frequencies of C2 *that*-complementizers in corpora suggests that it is indeed “unlikely that these structures are

entrenched in large parts of the population” and “are analogically formed on the few C1 clauses with a *that*-complementizer” (Hoffmann 2019: 212).

Given the (very) low frequencies of *that*-complementizers even in large sets of corpus data that consist of several thousand tokens (Hoffmann 2019; Hoffmann et al. 2020), all of the above claims about *that*-complementizers remain largely contestable, whether they argue in favor of parataxis or not. Thus, it will be interesting to see how this feature is rated in the psycholinguistic experiments (see chapter 5) by speakers of different varieties of English, especially in the case of *that*-complementizers in *both* C1 and C2. In this context, Hoffmann states, based on the results of his ICE corpus study, that “[stage] IV and III [...] varieties exhibit an even stronger paratactic relationship between C1 and C2” than stage V varieties (2019: 210).

If this holds true, acceptability ratings in the psycholinguistic experiments should reveal a correlation with the entrenched syntactic patterns of the specific constructional network of a given variety, such that speakers of varieties with strongly entrenched symmetric CC patterns (as evident from cross-clausal association phenomena determined in the corpus study), i.e., stage III and IV varieties, should give higher ratings to parallel structures with *that*-complementizers in both C1 and C2. Conversely, speakers of varieties that have entrenched more asymmetric patterns, i.e., in stage V, should give lower ratings to structures with *that*-complementizers in C1 and C2. Furthermore, *that*-complementizers in *only* C1 should receive higher ratings by speakers of stage V varieties, following Hoffmann’s findings that the preference for the absence of *that*-complementizers in C1 is less strong in stage V varieties, reflecting the fact that diachronically, “C1 used to be syntactically subordinate to C2” (Hoffmann 2019: 210). This is to be expected because, as Hoffmann notes, when there is dialect contact (as is the case in stage III and IV varieties) and speakers with slightly different mental networks encounter each other,

infrequent constructions of only a small number of speakers will often be lost, while form-meaning mappings that can be understood by a large number of speakers will become more strongly entrenched. (2019: 193)

In other words, in stage III and IV varieties, infrequent features such as *that*-complementizers in C1 (and SAI, see below) should have been mostly lost, i.e., even less frequent in corpus data and rated as less acceptable in psycholinguistic experiments than in stage V varieties. Finally, due to the fact that “*that*-complementizers are generally disfavoured in CC constructions” (Hoffmann 2019: 107), test items without any *that*-complementizers should get the best ratings in the experiments.

On top of that, it is possible that the use of *that*-complementizers is subject to adstrate/substrate effects. Recall Mesthrie’s (2006, 2008a, 2012) claim of a ‘deleting’ vs. ‘preserving’ dichotomy between African and South East Asian varieties of English (section 1.4). In this context, it appears plausible that speakers of ‘deleting’ varieties should prefer structures without *that*-complementizers, while conversely, speakers of ‘preserving’ varieties should give better ratings to overt *that*-complementizers. In fact, Mesthrie specifically claims that Black South African English (BSAfE) “has a preference for the overt expression of complementisers like *that*”, using the term ‘undeletions’ “to denote retentions in BSAfE for elements which are typically deleted (or unexpressed) in [Standard English]” (2008b: 494). Given that BSAfE “shares many syntactic features with other varieties of Sub-Saharan L2

English [...], perhaps more so with East Africa than West Africa” (Mesthrie 2008b: 488), a similar effect could apply to Kenyan English (KenE), another African variety that was investigated in the context of the introspective MET experiments.

On the other hand, in light of Kortmann’s claim of a “continuum along the parameter ‘deletion vs. preservation’ that ranges from Pidgins and Creoles as ‘deleters’ via L2 varieties to L1 varieties as ‘preservers’ (2014:176), the acceptability of *that*-complementizers should pattern differently, such that they are rated better by speakers of L1 varieties compared to speakers of L2 varieties.

3.1.2 Subject-auxiliary inversion

Apart from *that*-complementizers, optional subject-auxiliary inversion (SAI) in C2 (3.3) has also been brought forward as evidence of a hypotactic relationship between C1 and C2. Borsley, for example, notes that it “does not normally occur in subordinate clauses but occurs in various types of main clause” (2004: 75).

(3.3) [*The more they work,*]_{C1} [*the more [will I]_{SAI} pay them.*]_{C2}
 (from Hoffmann et al. 2020: 199)

The first thing to be noted about SAI is that it “is not possible in the corresponding declarative clauses⁸” (Hoffmann et al. 2020: 199), so that this is clearly a construction-specific idiosyncrasy that speakers must have stored in their mental grammars. As with *that*-complementizers, corpus studies have shown that SAI is a “fairly infrequent phenomenon” that is “clearly disfavoured” (Hoffmann 2019: 212). However, unlike *that*-complementizers, SAI appears to be restricted to C2. As den Dikken notes, SAI in the C1 clause is “profoundly ungrammatical” (2003: 2), and similarly, Culicover and Jackendoff note that it occurs “marginally [...] in C2 but not C1” (Culicover and Jackendoff 1999: 559). Likewise, Hoffmann states that “it is only C2 that allows optional subject-auxiliary inversion” (2019: 46).

Recent corpus investigations support the above claims. In his BROWN corpus study, Hoffmann (2019: 110) found only 16 instances of SAI in a data set of 105 C1C2 tokens (16/105 = 15%), and in his COCA study (2019: 127), he could only find 10 instances of SAI in a data set of 337 C1C2 tokens (10/337 = 3%). This apparently also applies across varieties of English; in his ICE data, Hoffmann found just 15 instances of SAI, out of 239 C1C2 tokens (15/239 = 6.27%), concluding that “inversion is generally disfavoured across all varieties (and across DM stages)” (2019: 214). Based on these low frequencies, Hoffmann concludes that SAI “does not play as prominent a role as is sometimes assumed in the literature” (2019: 126). However, as was the case with his corpus study on *that*-complementizers, his findings are based on rather small data sets or are restricted to the standard varieties, and even with regard to his ICE data he concedes that “the token size per variety [...] is fairly small” in his investigation (2019: 213).

In fact, it appears that in general, when it comes to the realization of BE in C2 clauses, “auxiliaries are far more often deleted than inverted” (Hoffmann 2019: 110), both in the standard varieties (Hoffmann 2019: 110) as well as across PCE varieties, in which “inversion [...] is never the preferred option” (Hoffmann 2019: 215). This observation adds an interesting dimension to the matter, especially when considering the fact that deletion and

8 Cf. [*the more [will I]_{SAI} pay them.*]_{C2} → **Will I pay them more.*

truncation phenomena in English CCs appear to be overwhelmingly symmetric (Hoffmann 2019: 48; cf. also Hoffmann 2014; Hoffmann et al. 2019; 2020). This, in turn, can be seen as further evidence of a paratactic relationship between C1 and C2: With verb deletion, C2 loses the possibility of being marked as main clause, and at the same time, speakers are provided with a further possibility of creating a symmetric structure by also deleting the verb in C1. Thus, the present study will also take into account deletion phenomena, which appear to compete with SAI. Following previous studies, it can be expected that deletion is clearly preferred in the corpus data, confirming that PdE CCs are considerably more paratactic than hypotactic. Accordingly, the present study will examine SAI in PdE based on corpus data from BNC, COCA, and GloWbE. Furthermore, like *that*-complementizers, SAI will also be examined with regard to its use in the various COCA registers and BNC modes (see section 3.1.1 above).

3.1.3 Object pronoun extraction

Various introspective studies have used what might be called the ‘extraction test’ to determine whether CCs in a given language are hypotactic or paratactic (e.g. Culicover and Jackendoff 1999; Borsley 2004; Abeillé et al. 2006). This involves trying to extract object pronouns from C1 and C2. Assuming that extraction is only possible out of main clauses, the clause status – main or subordinate – can then be determined. Abeillé et al., for example, used this method to determine that “the syntax of French CC[s] is symmetric” (2006: 14). Thus, in addition to *that*-complementizers and SAI, the possibility of extracting objects from C1 (3.4a), C2 (3.4b), and both clauses (3.4c) has also been discussed in the context of the syntax of English CCs (examples from den Dikken 2005: 504; ‘ec’ = ‘empty category’, also referred to as ‘trace’, or ‘gap’ elsewhere in the literature):

- (3.4) a. *a person who [the more you meet ec,]_{C1} [the more you hate him.]_{C2}*
 b. *a person who [the more you meet him,]_{C1} [the more you hate ec.]_{C2}*
 c. *a person who [the more you meet ec,]_{C1} [the more you hate ec.]_{C2}*

Now, assuming the view that CCs are hypotactic, extraction should only be possible from C2, which acts as main clause⁹. Under such an analysis, examples like (3.4a) and (3.4c) should not be possible, although they are attested in corpora and have been rated as acceptable in introspective studies. Culicover and Jackendoff, for example, maintain that what they call “across-the-board extraction” (ATB) (1999: 564), i.e., simultaneous extraction from C1 and C2, is possible, and proof that they “have the status of coordinate clauses” (1999: 567). Den Dikken, who argues in favor of universal hypotaxis in CCs across languages, treating “the first clause [C1] as an adjunct to the second [C2]” (2005: 507)¹⁰, claims that English is idiosyncratic in this respect, and that examples (3.4a-c) do “not represent the extraction possibilities of comparative correlatives universally” (2005: 504). Under this

9 As is the case in e.g. the asymmetric CC variant of Spanish (Abeillé et al. 2006: 16-17).

10 Note, however, that adjunct clauses are typically optional, which C1 is not, *contra* den Dikken’s analysis (as discussed by Abeillé and Borsley 2008; Borsley 2011). As Borsley notes, “the subordinate [C1] clause is obligatory” in English. Also note that C1 “cannot appear with an ‘ordinary’ main clause” (Borsley 2004: 75), which can be seen as further evidence against hypotaxis. As a counterexample, consider the Spanish asymmetric CC construction, in which the “subordinate clause can be used outside the CC as an ordinary adjunct clause” (Abeillé et al. 2006: 17).

analysis, C1 is an adjunct clause and the gap in C1 is “parasitic”, i.e., it depends on the presence of the gap in C2 that has already been extracted (2005: 507). This, however, would mean that cases in which there is extraction *only* in C1 as in example (3.4a) are ungrammatical.

The psycholinguistic experiments carried out in the context of the present study should provide clarification in this regard. Following den Dikken’s claims, object extraction from C2 alone (3.4b) should be rated better than extraction from C1 (3.4a) and ATB extraction (3.4c). Also, resumptive pronouns in C1 and C2 (i.e., no extraction at all) should be rated better than any of the other options. Note that this is also predicted by cognitive theories such as Hawkins’ Minimize Domains/Minimize Forms (2014), which assumes that “resumptive pronouns are preferred more often in structurally more complex environments for which overall efficiency is achieved through domain minimization at the expense of form minimization” (Francis 2015: 253). Because CCs that are embedded in relative clauses are prime examples of such ‘complex environments’, it can be assumed that resumptive, that is, overt pronouns, should be preferred over all other options.

3.2 Clause order

In chapter 1, it was argued that reductionist approaches to CCs as well as Culicover and Jackendoff’s CC template (1999: 567) are insufficient because they cannot accommodate certain phenomena at the meso-level, such as the cross-clausal associations that have recently been uncovered in corpus-based investigations (Hoffmann et al. 2019, 2020). A further limitation of Culicover and Jackendoff’s template and reductionist approaches to CCs is illustrated by clause order phenomena, that is, CC structures where the apodosis (C2) precedes the protasis (C1) (section 3.2.1), and so-called “stacked” (Hoffmann 2014a: 166; 2019: 168) CCs, which consist of three or more clauses (section 3.2.2).

3.2.1 Non-iconic C2C1 order

There is a variant of the “canonical” (Hoffmann 2018: 192; 2019: 173) C1C2 order in which the apodosis (C2) precedes the protasis (C1), as illustrated by example (3.5) from the BNC:

(3.5) *Think it over: [it gets worse,]c2 [the longer you look at it.]c1*
(BNC W_biography A7C)

This C2C1 order has also been referred to as “reversed” (McCawley 1988: 176), and it is synonymous to the C1C2 order because it carries the same meaning (i.e., asymmetric cause-effect and symmetric parallel change over time semantics). In the following, I will refer to such structures as exhibiting C2C1 order, based on Hoffmann’s terminology (*inter alia*, 2017b, 2018, 2019), and label the corresponding construction CC’, based on Culicover and Jackendoff’s terminology (1999: 549). In the context of cognitive approaches to grammar, the C2C1 order is of particular interest, because of the domain-general cognitive process of iconicity, i.e., the “(partial) motivation of a construction’s form by its meaning” (Hoffmann 2019: 12). In line with this principle, the C1C2 order can be described as iconic, as it encodes the temporal cause-effect semantics of the CC (cf. Hoffmann 2017b and 2019). As noted by Horsch (2020: 27), Hawkins’ Competence-Performance Hypothesis (2004) predicts that when two alternatives compete (such as C1C2 and C2C1), that which is easier to process will be

preferred. The C1C2 order, because it “mirrors the semantic [cause-effect] interpretation” (Hoffmann 2018: 186), should therefore be cognitively preferred¹¹ by language users, as they prefer “the processing of events in the temporal order in which they have been observed or the processing of causes before effects” (Hoffmann 2019: 12).

This prediction has been confirmed by several corpus studies, and across languages, in support of Goldberg’s Tenet #5 (2003: 219), which posits that cross-linguistic generalizations can be accounted for by general cognitive constraints (in this case iconicity). Hoffmann determined a C1C2:C2C1 ratio of 37:1 in a data set from the BROWN corpus family, and of 2:1 in data from the German LIMAS¹² corpus, leading him to refer to the C1C2 order as “canonical” (Hoffmann 2018: 192; 2019: 173). In a more recent study, Hoffmann et al. confirmed the strong preference for C1C2 over C2C1 in BrE, with a ratio of 15:1 in favor of C1C2 in a data set of all 2180 CC tokens that could be extracted from the BNC (Hoffmann et al. 2020: 204). Similarly, in a study based on the Slovak Web 2011 corpus that analyzed all 2420 C1C2/C2C1 tokens that could be retrieved, Horsch (2020) was able to determine a preference of 40:1 in favor of the C1C2 order, suggesting that this is a cross-linguistic phenomenon that is not restricted to English.

The CC’ construction is known in many languages, but it appears that the literature is divided on the question whether it should be treated as a variation of the CC or as a different construction altogether. Den Dikken, for example, acknowledges its existence in English, but maintains that it “should be kept separate from the comparative correlative [i.e., C1C2]” due to an absence of what he calls the “correlative particle”, that is, the clause-initial element *the* in C2 (2005: 513), concluding that the CC and CC’ constructions are “semantically very similar yet syntactically different comparative constructions” (2005: 509). In a similar vein, Borsley refers to the CC’ merely as a “related construction” to the CC (2004: 76). The present study takes a different stance, however, based on the fact that the C2C1 order is synonymous with C1C2 (see above), and that corpus examples have shown that C2 clause-initial elements can indeed be realized in English C2C1s (Hoffmann 2019: 103), as example (3.6) from the BNC illustrates:

(3.6) *Paradigmatically, a semantic affinity between two grammatically identical words is [the greater]_{C2} [the more congruent their patterns of syntagmatic normality.]_{C1}*
(BNC W_ac_soc_science)

11 Note that this is not the only explanation that has been put forward to explain the preference for the C1C2 order. For example, in his analysis of the German CC construction, Speyer argues that the reason why “left dislocation of correlative clauses [i.e., C1C2] is so frequent is that this is the only possibility to avoid a stress clash”, based on the assumption that both clauses “bear focus” (2011: 43).

12 Hoffmann has suggested that the significant difference in ratios between English and German could have to do with the clause-initial elements: in English they are identical (*the*_{C1}... *the*_{C2}...), while in German they differ (*je*_{C1}... *desto*_{C2}... or *je*_{C1}... *umso*_{C2}...), so that the “danger of erroneously parsing C2 as a C1 protasis clause is minimized” in German (2019: 156, cf. also Hoffmann 2014a: 173). However, it was shown in a corpus study of Slovak CCs (Horsch 2020) that in this language the ratio is even higher (40:1), despite different clause-initial elements (*čím*_{C1}... *tým*_{C2}...), leading to the conclusion that it is the obligatory word order in German (V2 in C2 as the main/matrix and V-final in C1 as the subordinate clause) that “reduces the probability of confusing C1 and C2 and thus allows German speakers more freedom to choose between C1C2 and C2C1”, resulting in a “considerably lower C1C2:C2C1 ratio” in German (Horsch 2020: 34).

Of course, in the context of the corpus study conducted in the present investigation, determining the frequency of C2C1 structures with and without the clause-initial element *the* in C2 will be of interest. If this feature is present in the corpus data with a frequency of more than just a few isolated cases, thereby proving that it is indeed a frequent feature of the C2C1 order in English, this would have implications for den Dikken’s claim about the absence of clause-initial elements in C2 being proof of a separate CC’ construction that is unrelated to the CC with its C1C2 order.

At this point, it must be noted that den Dikken’s claim of CC and CC’ being separate constructions is less tenable in other languages, as evidence from Polish (3.7) and Slovak (3.8) shows. In both of these languages, use of the C2 clause-initial elements *tym* (Polish) and *tým* (Slovak) is obligatory in the CC’ construction (cf. Horsch 2020: 27), and the word order in C2 does not have to change (i.e., C1 and C2 can simply be inverted without changing the clause-internal constituent order, as is obligatory in English¹³):

- (3.7) [**Tym** gorzej pracujesz,]_{C2} [im bardziej jesteś zmęczony.]_{C1}
 TYM worse work:you IM more are:you tired
 ‘The more tired you are, the worse you work.’
 (example from Borsley 2003, glossing by the author)

- (3.8) [**Tým** lepšie vidíš,]_{C2} [čím bližšie sa pozeráš.]_{C1}
 TÝM better see:you ČÍM closer REFL look:you:2:SG
 ‘You see (the) better, the closer you look.’
 (example from SNC, from Horsch 2020: 26)

It therefore seems appropriate to treat the CC’ in English (and in other languages as well) as part of the overall CC construction network, as advocated by Hoffmann (2019: 45). After all, the C2C1 order does not only encode the same semantics as C1C2, the two are also formally very similar (an observation that applies to many languages, cf. Polish and Slovak above). However, neither reductionist approaches, which cannot account for movement of a whole clause, nor templates like Culicover and Jackendoff’s (1999: 567), which only account for the C1C2 order, are able to accommodate CC’ constructions. Rather, it seems more plausible that speakers “have stored [...] two constructional templates” at the meso-level in the CC network (Hoffmann 2019: 48) that correspond to the C1C2 and the C2C1 orders, and belong to a more abstract CC construction at the macro-level. To account for the CC’ construction, Hoffmann therefore suggested the following template¹⁴ (2019: 49):

- (3.9) [(clause₂) (*the*) [_{comparative phrase₂}]_{C2_main clause}
 [*the* [_{comparative phrase_{1_i}} (... t_i ...)]_{C1_subordinate clause}]

Now, if we assume the C1C2 and C2C1 orders to be semantically equivalent, this raises the question what the purpose of the C2C1 variant is. An answer might be found, as was also discussed regarding *that*-complementizers and SAI, in pragmatics. Recall that Corollary A of

13 Although in Slovak, due to other cognitive principles, in the CC’ construction the constituent order in C2 shows a significant preference for that which is obligatory in the English CC’ (with *tým* in postverbal position), so that example (3.8) is more likely to appear as [*Vidíš tým lepšie,*]_{C2} [*čím bližšie sa pozeráš.*]_{C1} (Horsch 2020: 28).

14 Note that unlike the C1C2 template discussed in chapter 1, in this template C2 is clearly identified as a main clause and C1 as a subordinate clause. This is because in the C2C1 order, “the main clause status of C2 is fairly uncontroversial” (Hoffmann 2019: 45; cf. also Borsley 2004: 75).

Goldberg's Principle of No Synonymy posits that when "two constructions are syntactically distinct and [semantically] synonymous", they must differ regarding pragmatics (1995: 67), i.e. one must have a communicative purpose that the other does not have. Support for this explanation comes from the "emotive principle", originally referred to as "principle of emphasis" (Firbas 1964: 117). This principle was discussed at length by Firbas in the context of his theory of Functional Sentence Perspective (FSP, cf. Firbas 1992) and states that an unusual constituent order such as C2C1 (or SAI, for that matter), i.e., a word order that "in a way that strikes the recipient as more or less out of the ordinary [...] fulfills an additional communicative purpose not served by the usual order" (1992: 118). In this context, Hoffmann speaks of a "functional differentiation" between C1C2 and C2C1 that results in a pragmatic difference (2019: 157, based on Sudhoff 2010), and very plausibly suggests that the particular pragmatic function is focus, as is evident from the focus particle *even* in English, which appears to be more acceptable in the C2C1 (3.11) order, a fact also noted by Hoffmann et al. (2020: 204). Under this analysis, "the use of a focus particle in C2 is more acceptable in CC' constructions" (Hoffmann 2019: 157):

(3.10) [*The more you think about it*]_{C1} [*the more interesting it (?even) becomes.*]_{C2}

(3.11) [*It becomes even more interesting*]_{C2} [*the more you think about it.*]_{C1}

It must be noted, however, that presently this explanation is merely tentative. The question whether the C2C1 order serves pragmatic purposes would ideally be resolved using psycholinguistic experiments. However, addressing this issue was beyond the scope of the present investigation, so that it must be left to future research. Rather, the focus will be on whether the findings from previous studies can be confirmed, and whether there is a correlation between the amount of C2C1 structures and DM stage. Now, following Hawkins' Performance-Grammar Correspondence Hypothesis (PGCH, 2004), the C1C2 order should be more deeply entrenched and thus appear with a significantly higher frequency in corpus data (as the results of the corpus studies discussed above also suggest). PGCH predicts that syntactic patterns in languages are "conventionalized" (i.e., entrenched) in proportion to the degree of preference in performance, as *evidenced by patterns of selection in corpora*" (Hawkins 2004: 3, emphasis JH). In other words, across all English varieties, the iconic C1C2 order should appear with a considerably higher frequency in the corpus data, proving that it is more deeply entrenched than the non-iconic C2C1 order (cf. Hoffmann 2019: 13).

Nevertheless, despite a general preference for the iconic C1C2 order across all English varieties – Hoffmann has provided some evidence of this based on the ICE data set (2019: 204) – we can expect, based on the findings of previous corpus studies, a certain proportion of C2C1 structures. With regard to the meso-constructural network, however, the CC' construction should show less variation with regard to lexical items than the canonical variant. This is because, as Hoffmann notes, the latter is used more frequently, and thus with a "greater range of different lexical items" (2019: 13). Thus, we can expect that "the iconic C1C2 CC construction is also much more productive than the non-iconic C2C1 CC' construction" (Hoffmann 2019: 71). This should be detectable by means of LNRE modeling of the C1C2 and C2C1 data sets, such that in C2C1 data sets, the productivity curves should be less steep, and generally lower than in the C1C2 data sets.

In the context of the Dynamic Model, the corpus data should reveal that the iconic C1C2 order is more deeply entrenched (i.e., even more favored over the C2C1 order) in PCE

varieties, which, as Hoffmann notes, “only developed during the EModE and PdE period” (2019: 204), when the C1C2 order had already become dominant¹⁵. Hoffmann did indeed detect a “trend for the more iconic construction” in stage III Englishes (2019: 204) in his rather small ICE data set – he could find only 15 instances of C2C1 structures across DM stages III-V, with eight of those in stage V – and argued that this lends support to the claim that L2 English varieties are characterized by stronger prototype and processing effects than L1 varieties, even though he had to concede that his data could not prove a trend that would be “statistically significant” (2019: 204) because “the sample size of [the] study is simply too small to detect any significant preference for C1C2 [over C2C1] structures” (2019: 206).

With the considerably larger data set available for analysis in the present study, Hoffmann’s claim about a stronger preference for the iconic C1C2 order in PCEs (as opposed to stage V varieties) will be revisited. This will also permit addressing the “gap” that Hoffmann found in his data for the HKE, KenE, NigE, and TanzE varieties, for which he could not find any C2C1 structures (2019: 206). It should be possible to clarify whether Hoffmann’s ICE data had just an “accidental gap” or whether the above varieties have “a categorical preference for the more processing-efficient [C1C2] structure” (2019: 206), thereby addressing his call for future investigations regarding this matter. Finally, examining the frequency of C2C1 structures and their types in the corpus data will shed more light on the general degree of entrenchment of constructions at the meso-constructional level, and thus provide a better overall understanding of the mental network of CCs in each variety. As Hoffmann notes, “[b]y contrasting the number and types of different C1C2 and C2C1 constructions, it will be possible to chart the full mental network of constructions with a comparative correlative meaning”. (2019: 48)

3.2.2 Stacked CCs

In addition to the CC’ construction, there is one more clause order phenomenon in CCs that has been discussed controversially in the literature. These are so-called “stacked” CCs (Hoffmann 2014a: 166; 2019: 168), which usually consist of three subclauses that are ‘stacked’ on each other, as in (3.12). However, examples with as many as six stacked clauses have been attested in corpus data (3.13), suggesting that in theory, there is no limit to the number of clauses that can be stacked¹⁶.

(3.12) [*The more I see,*]_{C1} [*the less I know,*]_{C2} [*the more I like to let it go*]_{C3}
(Red Hot Chili Peppers – *Snow (Hey Oh)*)

(3.13) [*The more the family,*]_{C1}
 [*the greater should be the spacing between births,*]_{C2}
 [*the fewer the number of offspring,*]_{C3}
 [*the lower the rate of infant mortality,*]_{C4}
 [*the more stable the family system,*]_{C5}
 [*and the better developed the parental care.*]_{C6}
(COCA wlp_academic_rpe/wlp_acad_1990 ##4000356 Line: 23)

15 As has been pointed out, Old English preferred the non-iconic C2C1 order (Hoffmann 2019: 55).

16 Note that the present study will restrict itself to stacked CCs with three subclauses, so-called “tripartite CCs” (Hoffmann 2019: 106), as a detailed discussion of structures with more than three subclauses would be beyond the scope of this investigation.

There appear to be three subtypes of tripartite CCs (Hoffmann 2014a: 106-107; 2019: 103-104): (1) Type A (3.14), where “two independent factors [C1a and C1b] have the same result” (2) Type B (3.15), which “emphasize[s] that a single independent factor can yield two independent results [C2a and C2b]”, and (3) Type C (3.16), with a “three-step conditional relationship” whereby C2 is the apodosis of C1 and the protasis of C3 (Hoffmann 2019: 104).

(3.14) **Type A: C1a and C1b → C2**

[*The longer a diver remains under water*]_{C1a} and [*the greater the depth*]_{C1b}
 [*the more nitrogen is absorbed*]_{C2}
 (BNC W_newsp_brdst A97)

(3.15) **Type B: C1 → C2a and C2b**

[*The better the credit*]_{C1} [*the better the conditions of lending*]_{C2a} and
 [*the better the interest rates*]_{C2b}
 (GLOWBE-AU wlp_au_kso/wlp_au_g01 general ##676903 Line: 25)

(3.16) **Type C: C1 → C2 → C3**

[*The more school projects you take up*]_{C1} [*the more “visible” you are to your reporting officers*]_{C2} [*the faster you get promoted*]_{C3}
 (GLOWBE-SG wlp_sg_jsu/wlp_sg_g01 ##1026801 Line: 420)

Regarding semantics, tripartite CCs are particularly interesting in English because the clause-initial elements are the same, which can lead to ambiguity. While in languages like German, Spanish, and Slovak, the clause-initial elements differ, clearly marking protasis and apodosis and thus, the semantic relationship between each subclause, in English this is not the case. Unless there are overt conjunctions between the subclauses (as in Types A and B), there can be cases where it is difficult to interpret the tripartite CCs¹⁷, as example (3.17) demonstrates:

(3.17) [*the more extreme the primary gets*]_{C1} [*the more difficult it gets*]_{C2} [*the more unreal the debates become*]_{C3}
 (COCA wlp_spoken_kde/wlp_spok_2012 ##4103635 Line: 31)

Note that in (3.17), it is unclear whether semantically, the third subclause is a C3, such that the whole structure would be of Type C. It could also be interpreted as Type A (‘the more extreme the primary gets **and** the more difficult it gets, the more unreal the debates become’; C1a and C1b → C2) or as Type B (‘the more extreme the primary gets, the more difficult it gets **and** the more unreal the debates become’; C1 → C2a and C2b).

What is also interesting in terms of semantics is the fact that in tripartite CCs of Type C, C2 has a double function: (1) as apodosis (effect) to C1 and (2) as protasis (cause) to C3. Hoffmann notes that this is a case where the “one-to-one form-meaning correspondence” (2019: 104) of CC subclauses does not apply, and that speakers therefore must have stored “both C1 and C2 clauses [...] as independent constructions”, in addition to a “complex C1C2 construction” (2019: 104). Such a constraint-based analysis is the only way to account for tripartite Type C structures; Hoffmann argues that such patterns “in which two C1C2 constructions are blended with the second clause C2 in a pivot position” (2019: 203) are

17 This, of course, concerns written language only. As Hoffmann notes, in spoken language intonational contours facilitate the distinction between protasis and apodosis, such that in C1C2C3 structures without overt conjunctions, a “rise on the second comparative phrase signals the independent variable use” (2013a: 326).

probably the result of “online created constructs [...] whose meaning is derived by a blend of two phrasal C1C2 constructions” (2019: 105).

In any case, not all sources agree that stacked CCs without overt conjunctions should be possible at all in English. Den Dikken, for example, claims that the CC construction “does not allow stacking” and that structures consisting of three subclauses are “grammatical only with an overt conjunction between the two consequent clauses” (2005: 503), using this “ban on stacking” as evidence against parataxis in CCs (2005: 504). However, stacked CCs without overt complementizers have been attested in corpus data (Hoffmann 2019) and appear to be mildly frequent; in his data set of 160 C1C2 tokens from the BROWN corpus family, Hoffmann found 11 instances (11/160 = 6.9%) of such structures. Of course, in the context of the present study, the question is whether a similar ratio can be found in the considerably larger BNC, COCA, and GloWbE data sets. If the results of Hoffmann’s BROWN corpus study can be corroborated and a similar amount of stacked CCs of Type C can be retrieved, this would have far-reaching implications for hypotactic analyses that do not allow such structures (cf. den Dikken 2005), as tripartite CCs without overt conjunctions can only be analyzed as coordinated structures, as noted by Hoffmann (2019: 105).

There are also stacked structures even more complex than those discussed by Hoffmann (2014, 2019). These include what might be interpreted as C1a-C1b → C2a-C2b (3.18), with and without overt conjunctions, or ‘reversed’ stacked CCs of Types A (3.19) and B (3.21). Note also that the conjunction between clauses does not necessarily have to be *and*, as (3.20) shows, a point not mentioned in previous studies.

(3.18) C1a (*and*) C1b → C2a (*and*) C2b

In general, [the less objective the perception]_{C1a} and [the more it was influenced by partisan factors,]_{C1b} [the greater the influence of the press]_{C2a} and [the less the influence of television.]_{C2b}

(BNC W_ac_polit_law_edu A62)

(3.19) ‘Reverse’ Type A: C2 ← C1a (*and*) C1b

[Unemployment is clearly a more serious problem,]_{C2} [the greater is the number of unemployed]_{C1a} and [the longer is the average duration of unemployment spells.]_{C1b}

(BNC W_commerce BNW)

(3.20) ‘Reverse’ Type A with *or*

*[The effect was more pronounced]_{C2} [the lower the rate of fluid absorption]_{C1a} *or* [the higher the rate of fluid secretion]_{C1b}*

(BNC W_ac_medicine HWS)

(3.21) ‘Reverse’ Type B: C2a (*and*) C2b ← C1

[The lines grow longer]_{C2a} and [tempers get shorter]_{C2b} [the closer the San Francisco Giants get to the post season.]_{C1}

(GLOWBE-CA wlp_ca_usi/wlp_ca_g04 ##490272 Line: 27)

While these are certainly very interesting structures, both semantically as well as formally, they are individual cases in the corpus data, and will thus not be taken into account in the statistical analyses. However, they do underscore two facts discussed above: Firstly, very restrictive approaches to CCs such as den Dikken’s categorical “ban on stacking” (2005: 503) are untenable given that there is even more variation than has been discussed in the literature so far. Secondly, approaches that assume the existence of a maximally abstract CC template in

combination with two subclauses C1 and C2, each of which carries exactly one meaning (cf. e.g. Culicover and Jackendoff 1999; Sag 2010), are insufficient for accounting for stacked constructions. Rather, the above corpus examples support the view that “online created constructs” as a result of blending (Hoffmann 2019: 105) are indeed possible and have to be taken into account. The great variety of stacked CCs also implies that the mental network behind the CC construction is much more flexible than has been previously assumed, i.e., the construction is highly productive not only regarding the slots *within* the C1 and C2 subclauses, but also with respect to their combination and ordering. This is certainly an aspect that will have to be investigated in future studies.

Regarding stacked constructions across English varieties, Hoffmann’s (2014a,b; 2019) ICE corpus study turned up some interesting results. While in general, it appears that stacked CCs “are rare in all [ICE] corpora”, Hoffman found that the BrE tokens made up “almost one third” of all stacked CC tokens (2019: 201), suggesting that “it is the strong entrenchment of the individual C1 and C2 clause as well as C1C2 constructions in BrE that accounts for this preference” (2019: 204). However, Hoffmann’s findings are not only based on a relatively small data set, he also found that there are other stage V varieties that do not correspond to this trend, leading him to conclude that “future research needs to investigate to what degree different varieties of English license such tripartite CC structures” (Hoffmann 2019: 204). Accordingly, one of the aims of the present study is to determine, using considerably larger data sets, whether there is a correlation between stacked CCs and Dynamic Model stages. Following the assumption that in general, varieties further along the cycle have more abstract and less concrete constructions, it can be expected that stage V varieties have a higher ratio of stacked CCs, reflecting a strong entrenchment of the subclauses.

3.3 Cross-clausal associations

As was discussed in section 1.1, previous small-scale (Hoffmann 2014; 2018; 2019) and large-scale (Hoffmann 2019; Hoffmann et al. 2019; 2020) corpus studies have revealed, by means of covarying-collexeme analysis (see section 2.1.1.2), statistically significant cross-clausal associations in English C1C2 structures that cannot be accounted for by maximally abstract rules or templates that assume that C1 and C2 are realized independently. Beyond illustrating the shortcomings of context-free approaches, the results of these corpus studies also have direct implications for the question whether the English CC is a hypotactic or a paratactic construction. Because almost all of the cross-clausal associations that were determined in these corpus studies were symmetric, it can be assumed that “the central properties of Modern English CCs are paratactic, not hypotactic” (Hoffmann et al. 2020).

Furthermore, cross-clausal associations provide evidence of the entrenchment of specific meso-constructions. In the words of Brunner and Hoffmann, “each [statistically] significant interaction represents a separate node in the respective speakers’ constructional network” (2020: 21). For example, in his ICE study, Hoffmann found “significant interaction effects” with regard to filler types in C1 and C2 (a phenomenon discussed in more detail in section 3.3.2 below), such that “a NP filler in C1 will significantly increase the probability of a NP filler in C2, while ADVP fillers in C1 significantly co-occur with ADVP fillers in C2” (2019: 216-218). From this, we can assume the existence of “entrenched [*the NP ...*]_{C1} [*the NP ...*]_{C2} and [*the ADVP ...*]_{C1} [*the ADVP ...*]_{C2} constructional templates (2019: 218). Based on

statistically significant cross-clausal associations, it is thus possible to subsume the existence of meso-constructions, which can be illustrated based on the abstract CC template discussed in section 1.2. For example, based on the fact that their data showed a statistically significant association for the filler type pattern $\text{AdjP}_{C1}\text{-AdjP}_{C2}$ (collostructional strength 6.494***), Hoffmann et al. suggested the following form-meaning pairing (2019: 27), i.e., construction (3.22), based on their abstract CC template:

(3.22) **ADJP-ADJP CC construction** (Hoffmann et al. 2019)

FORM:	$[\delta\partial []_{\text{ADJP_comparative phrase1}} (\text{clause}_1)]_{C1}$ $[\delta\partial []_{\text{ADJP_comparative phrase2}} (\text{clause}_2)]_{C2}$
MEANING:	‘[As the degree of comparative phrase1 increases/decreases with respect to clause ₁] _{independent variable} [so the degree of comparative phrase2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way

Of course, such form-meaning pairings can be posited for every statistically significant cross-clausal association, thereby unearthing entrenched meso-constructions and shedding light on how they interact, in other words, we can get an idea of how the meso-constructional network is structured. Expanding on the studies outlined above, the present investigation will take a closer look at cross-clausal associations in English C1C2 structures regarding lexical fillers (section 3.3.1), filler types (section 3.3.2), and deletion and truncation phenomena (section 3.3.3). Apart from contributing to the discussion about whether CCs are hypotactic or paratactic structures, the aim is thus to detect entrenched patterns in corpus data with the help of the advanced statistical methods outlined in chapter 2. This, in turn, will facilitate exploring and comparing the meso-constructional CC networks of different varieties of English.

3.3.1 Lexical fillers

The first of the three types of cross-clausal associations that the present study will investigate is more concrete (or substantive) than the others, and can thus be considered to be located at a lower level in the meso-constructional network. While in theory, speakers can freely choose the lexical material with which to fill the lexical filler slots of the CC constructional template, previous studies have turned up evidence suggesting that certain lexical material is significantly preferred. This has been determined in several corpus studies, the first of which was an investigation of lexical filler patterns across C1 and C2, conducted in the context of Hoffmann’s (2014a, 2019) small-scale BROWN corpus study. In this study, Hoffmann could determine six statistically significant cross-clausal associations by means of covarying-collexeme analysis (2019: 111). The most relevant finding in the context of the parataxis vs. hypotaxis debate was that “the most frequently co-occurring pairs that are identified as significant [...] have identical lexical items in C1 and C2 and express a positive increase in degree” (2019: 111-112), suggesting that in this regard, CCs have a strong preference for symmetric form.

Hoffmann’s BROWN data set, however, was relatively small. Based on the fact that “none of the significant filler pairs [had] an expected frequency $\geq 5^{18}$ ”, Hoffmann conceded that his results “have to be taken with a grain of salt” (2019: 111). Thus, perhaps the most

18 Cf. section 2.1.1.2 for details on the expected frequency threshold.

enlightening corpus study to date regarding lexical fillers is Hoffmann et al.'s (2019) COCA-based investigation of cross-clausal associations¹⁹. Based on the tried and tested methodology of earlier small-scale pilot studies²⁰ (Hoffmann 2014a, b, 2019), Hoffmann et al. found that the following four lexical fillers were statistically significantly associated across C1 and C2, despite the fact that their data contained 855 hapaxes out of 965 different lexical filler pairs, evidence of the high degree of variability and productivity of these slots (2019: 15, collostructional strength values provided in brackets):

- $more_{C1} \times more_{C2}$ (28.315 ***)
- $sooner_{C1} \times better_{C2}$ (12.293 ***)
- $more_{C1} \times less_{C2}$ (4.081 ***)
- $longer_{C1} \times greater_{C2}$ (2.799 **)

Concerning lexical filler associations across varieties of English, Hoffmann's ICE study (2014a,b; 2019) turned up some interesting results. First, he found no significantly associated lexical filler pairs in BrE (stage V), one such pair in JamE (stage IV), and three in PhilE (stage III) (2019: 224). This suggests that “the variability of fillers in [BrE] is so high that no single combination of fillers turns out to be statistically significant” (Brunner and Hoffmann 2020: 7), and led Hoffmann to conclude that

varieties at the nativization stage [i.e., stage III] rely more on meso-constructions while PCEs at later stages seem to make greater use of more abstract macro-constructions. (2019: 224)

Hoffmann also calculated the proportion of significant lexical filler meso-constructions vs. the total number of CC tokens, to determine “to what degree a variety draws on significant meso-constructions” (2019: 225). In general, the results confirmed the tendency towards more abstract constructions in varieties that are farther along the DM cycle although there were some exceptions that Hoffmann attributed, at least in part, to small sample sizes (2019: 226). Again, this highlights the importance of using larger corpus samples: Hoffmann admits that “further future research” is required in this context (2019: 226). Thus, the present study will also investigate whether there is a correlation between DM stage and the “abstractness of constructional representations” (Hoffmann 2019: 226), as is evident from the ratio of statistically significant meso-constructions in relation to the overall amount of CC tokens of the corpus data. This point is discussed in more detail in section 3.4 below.

Finally, there is also a qualitative dimension to lexical fillers in CCs. As Hoffmann noted, “adjectives [...] which would normally have a synthetic comparative form [...] can appear more freely with an analytic comparative [...] in CC constructions” (2019: 49). Hoffmann argues that this is due to the existence of “a meso-constructional C1C2 template [...] into which adjectives can be inserted without being licensed by the independent analytic comparative constructions first” (2019: 49). However, Hoffmann was able to identify only one such meso-constructional template, in PhilE (2019: 230), although he also acknowledges the “small sample size and infrequency of this pattern in the ICE corpora”, calling for future studies based on “considerably more data” (2019: 236) that take “a much closer look” at this phenomenon “using larger corpora” (2019: 231). Accordingly, the present investigation will use the considerably larger GloWbE data set to see which varieties have entrenched the lexical filler *more* in C1 and C2, and whether there are indeed “qualitative meso-

¹⁹ The data set used by Hoffmann et al. is also part of Hoffmann's (2019) study, which is why the latter will be disregarded in the discussion here.

²⁰ Using covarying-collexeme analysis (cf. section 2.1.1.2).

constructional innovations during the nativization stage” (Hoffmann 2019: 231) in PCEs with regard to periphrastic comparative forms.

3.3.2 Filler types

Moving away from the more concrete lexical filler associations across C1 and C2, let us take a look at a more abstract level in the meso-constructional network: filler types. As discussed in section 1.1, the comparative element slot in C1 and C2 can be filled by an adjective phrase (AdjP) (3.23), an adverb phrase (AdvP) (3.24), a noun phrase (NP) (3.25), or a prepositional phrase (PP) (3.26)²¹.

- (3.23) [*the [deader]_{AdjP} he is,*]_{C1} [*the [safer]_{AdjP} he is.*]_{C2}
(COCA wlp_fiction_awq/wlp_fic_1990 ##1050017 Line: 557)
- (3.24) *Of course,* [*the [more]_{AdvP} you trade,*]_{C1} [*the [more]_{AdvP} you pay in commissions.*]_{C2}
(COCA wlp_magazine_qri/wlp_mag_1999 ##2034941 Line: 29)
- (3.25) *Generally,* [*the [more snow]_{NP},*]_{C1} [*the [less danger]_{NP} there is to skiers.*]_{C2}
(BNC W_newsp_brdst_nat_misc AHC)
- (3.26) *However,* [*the [further from the centre of Melbourne]_{PP}*]_{C1} [*the more conservative the party becomes.*]_{C2}
(GLOWBE-AU wlp_au_kso/wlp_au_b01 ##3732748 Line: 36)

Now, in Generative approaches, which analyze CCs with maximally abstract rules (e.g. A-bar movement or WH-movement), C1 and C2 are treated as separate constituents that are syntactically independent from each other. Most of these approaches treat CCs as hypotactic constructions, “with [...] C1 being an embedded adjunct/subordinate CP that is adjoined to the main clause C2 CP” (Hoffmann et al. 2019: 4). Recent corpus investigations, however, have provided empirical evidence that CCs are mostly paratactic, not hypotactic. This evidence comes from statistical analyses of the filler types and truncation/deletion phenomena (see section 3.3.3 below) in C1 and C2. By means of covarying-collexeme analysis, Hoffmann et al. (2019; 2020) determined exactly the same statistically significant cross-clausal associations in their COCA and BNC data, all of which were symmetric, as the following overview demonstrates:

Cross-clausal filler type associations (COCA; Hoffmann et al. 2019: 14)

ADVP_{C1}-ADVP_{C2} (coll. strength 13.544***)

ADJP_{C1}-ADJP_{C2} (coll. strength 6.494***)

NP_{C1}-NP_{C2} (coll. Strength 4.728***)

Cross-clausal filler type associations (BNC; Hoffmann et al. 2020: 207)

ADJP_{C1}-ADJP_{C2} (coll. strength 26.647***)

ADJP_{C1}-ADJP_{C2} (coll. strength 15.068***)

NP_{C1}-NP_{C2} (coll. strength 5.183***)

Concerning filler type associations in PCEs, Hoffmann’s small-scale ICE study, which did not employ covarying-collexeme analysis, but HCFA instead, turned up similar results,

21 Some sources also mention a so-called “predicative Special Construction” (Hoffmann 2019: 216; see example (1.9) in section 1.1). However, due to their low frequency they will not be included in the present study – Hoffmann notes that “Special Construction fillers are disfavoured in C1 and C2” as “for all DM stages [...] there is one variety that provides *exactly one token*” (2019: 216, emphasis JH) in his corpus data.

leading him to conclude that “the choice of FILLER TYPE C1 very often seems to be mirrored by the same FILLER TYPE C2 across all DM stages” (2019: 216):

Cross-clausal filler type associations (ICE; Hoffmann 2019: 218)

NP_{C1}-NP_{C2} (p -value <0.01**)

ADVP_{C1}-ADVP_{C2} (p -value <0.01**)

ADVP_{C1}-NP_{C2} (p -value <0.01**)

Assuming that statistically significant cross-clausal associations are evidence of the entrenchment of constructions at the meso-level (see above), these results allow us a glimpse into the constructional network of English CCs. Note, however, that meso-constructions do not preclude the existence of a macro-construction. As Hoffmann et al. note, more than half of their tokens “exhibit[ed] non-significant FILLER TYPE pairs and can, therefore, be said to be created using a macroconstruction” (2019: 24).

As has been noted before, Hoffmann’s ICE data set was comparably small, with no more than 351 C1C2 tokens. On top of that, Hoffmann analyzed this data with HCFA but did not use covarying-collexeme analysis, as Hoffmann et al. have done in their recent large-scale BNC and COCA studies (2019; 2020). Therefore, the present study will expand on Hoffmann’s ICE study by applying covarying-collexeme analysis to the considerably larger C1C2 data set that was extracted from GloWbE. Of course, it will be interesting to see whether there are any variety-specific or DM stage-specific preferences. While Hoffmann’s HCFA analysis of his ICE data set “identified no significant association of the variables FILLER TYPE C1 and FILLER TYPE C2 with either DM STAGE or VARIETY” (2019: 218), it must again be noted that this finding was based on a small data set. The present investigation will also employ HCFA to test the findings of Hoffmann’s ICE study against a much larger data set consisting of several thousand CC tokens.

Concerning the hypotaxis vs. parataxis debate, the results of Hoffmann’s (2019) ICE study (two out of three cross-clausal filler associations were symmetric, see above) suggest that we can expect effects of parallelism similar to those determined by Hoffmann et al. in their COCA and BNC studies (2019; 2020). Of course, when considering previous findings, the question arises whether significantly associated FILLER TYPE pairs are really meso-constructions in their own right, or whether they “are merely the result of specific [lexical filler] associations that interact with the variable FILLER TYPE (e.g. due to all AdvPs being instantiations of *more*)” (Hoffmann et al. 2019: 15). This is why Hoffmann et al. also subjected filler type-lexical filler interactions to a covarying-collexeme analysis, to “identify specific lexical filler collocations across the two clauses” (2015: 15). Indeed, it turned out that some lexical fillers were “strongly tied to specific phrasal categories” (Hoffmann et al. 2019: 16). For example, Hoffmann et al. found that the $more_{AdvP} \times more_{AdvP}$ lexical filler combination “functions as a strong prototype for the abstract AdvP-AdvP meso-construction” (2019: 16).

However, as Hoffmann et al. also note, in their data this lexical filler combination made up less than half of the AdvP_{C1} × AdvP_{C2} tokens in their data, which implies that the “AdvP-AdvP association effect cannot be fully explained by lexical effects”, and that the statistically significant AdjP-AdjP and NP-NP associations which they also determined “do not seem to exhibit a lexical prototype” at all (2019: 16). What follows from this is that the AdjP-AdjP and NP-NP filler type associations are entrenched due to their “great type frequency”

(Hoffmann et al. 2019: 16), and not due to lexical effects. In any case, the present study will adopt Hoffmann et al.'s methodology of testing for interactions between lexical fillers and filler types in order to ensure that cross-clausal filler type associations are not influenced by lexical effects.

3.3.3 BE-deletion and truncation

In addition to lexical fillers (section 3.3.1) and filler types (section 3.3.2), two more phenomena will be analyzed with regard to cross-clausal associations: BE-deletion and truncation. These terms refer to deviations from 'full-clause' CC patterns, where the clause slot is filled (3.27):

(3.27) *In which case, Master, [the sooner **[we begin.]**]_{full clause C1} [the sooner **[we finish.]**]_{full clause C2}*
(BNC W_fict_prose H9C)

As was the case with filler types, two recent large-scale studies (Hoffmann et al. 2019; 2020) revealed statistically significant associations across C1 and C2 that suggest the entrenchment of meso-constructions with regard to deletion and truncation patterns. Hoffmann et al.'s BNC study unearthed "exactly the same five meso-constructions" as their previous COCA study (2020: 213), and as was the case with filler types, they found "that only symmetric combinations exhibit statistically significant attraction" (Hoffmann et al. 2020: 208). With regard to the parataxis vs. hypotaxis debate, this constitutes "clear evidence [...] that the central properties of Modern English CCs are paratactic, not hypotactic" (2020: 213).

As was discussed in chapter 1, deletion of the copula BE is possible in both C1 and C2 (3.28), but ungrammatical in corresponding declarative sentences (3.29):

(3.28) *[The warmer the weather **[is]**]_{BE-deletion C1} [the quicker the germination **[is]**]_{BE-deletion C2}*
(GLOWBE-AU wlp_au_kso/wlp_au_g01 ##506918 Line: 24)

(3.29) **The weather is warmer. / The germination is quicker.*

However, this kind of deletion "is not unconstrained", as noted by Hoffmann (2019: 50, who refers to Borsley 2004, and Culicover and Jackendoff 1999). In the literature, there are differing opinions on when BE-deletion is acceptable. For example, it has been claimed to be possible "only if the filler is a fronted complement [...], BE functions as the main verb [...], there is no *that*-complementizer [...] and the subject of the clause has a non-specific interpretation", although "not all of these restrictions seem to be equally strong" (Hoffmann 2019: 51). Moreover, there appear to be different subtypes of BE-deletion²². In addition to BE main verb deletion as in (3.28) above, Hoffmann identifies "auxiliary-verb deletion" (2019: 51), where the deleted BE is an auxiliary, as in example (3.30):

(3.30) *[The more energy **[is]**]_{auxiliary BE-deletion} released,]_{C1} [the more stable the compound.]_{C2}*
(GLOWBE-GB wlp_gb_genl_lsp/wlp_gb_g03 ##1804022 Line: 76)

The CC data sets extracted from COCA, BNC, and GloWbE were therefore coded to distinguish between main verb BE and auxiliary BE-deletion, and also between main verb BE retention (3.31) and auxiliary BE-retention (3.32):

²² Note that the concept of copula deletion is debatable, at least from a usage-based perspective. As Hoffmann et al. have noted, "the absence of BE can also be modelled constructionally without the assumption of a deleted, covert form of BE" (2019: 7).

(3.31) *And [the longer a home [is]_{BE MV-retention} on the market]_{C1} [the lower the selling price [is]_{BE MV-retention}]._{C2}*
(GLOWBE-CA wlp_ca_usi/wlp_ca_b02 ##3350551 Line: 100)

(3.32) *[The earlier the problems [are]_{auxiliary BE-retention} addressed,]_{C1} [the less money and less assistance [is]_{auxiliary BE-retention} needed]._{C2}*
(GLOWBE-NZ wlp_nz_poj/wlp_nz_b01 ##3786969 Line: 21)

With regard to BE-deletion, previous corpus studies have been able to determine the following cross-clausal associations using covarying-collexeme analysis:

Cross-clausal BE-deletion associations (COCA; Hoffmann et al. 2019: 19)

BE-DELETED MV_{C1} - BE-DELETED MV_{C2} (coll. Strength 30.274***)

BE-RETAINED MV_{C1} - BE-RETAINED MV_{C2} (coll. Strength 6.177***)

BE-RETAINED MV_{C1} - BE-RETAINED MV_{C2} (coll. strength 1.661**)

Cross-clausal BE-deletion associations (BNC; Hoffmann et al. 2020: 209)

BE-DELETED MV_{C1} - BE-DELETED MV_{C2} (coll. Strength 75.632***)

BE-RETAINED MV_{C1} - BE-RETAINED MV_{C2} (coll. Strength 5.263***)

BE-DELETED AUX_{C1} - BE-DELETED AUX_{C2} (coll. strength 2.246**)

In addition to BE-deletion, CCs in English can also be truncated so that only the comparative phrase remains (3.33), i.e., the optional clause slot is not filled at all. As Hoffmann et al. note, “there are [...] well-known truncated CCs that appear to have become lexicalized” (2020: 201), as example (3.34), a well-known proverb, shows:

(3.33) *I always say [the more]_{C1} [the better]._{C2}*
(GLOWBE-CA wlp_ca_usi/wlp_ca_b01 ##3336938 Line: 2)

(3.34) *[The more,]_{C1} [the merrier]._{C2}*

Note that there are also structures that appear to be the result of even further truncation, down to just the protasis C1 clause, as in (3.35), the title of a public service announcements series from the National Broadcasting Company (NBC)²³. Such structures must have been licensed by the CC construction, as the combination of a definite article with a comparative phrase (and not a noun) is clearly ungrammatical in other contexts (see the discussion in section 1.2). Examples like (3.35) have even entered colloquial language as a catchphrase, evident from the fact that it has at least four definitions in the Urban Dictionary²⁴, and from examples such as (3.36-3.37):

(3.35) *[The more you know]._{C1}* (NBC show)

(3.36) *In real life Japan, Tengu are important figures in folklore and Dai-Tengu masks are iconic of the culture. A lot of old fashioned porn also involved Tengu noses being used as dildos. **The more you know!***

(<https://1d4chan.org/wiki/Kensei>, accessed 23 Nov 2020)

(3.37) *Did you know that The Smurfs is Les Schtroumpfs in French? **The more you know!***

(<http://www.dutchblitz.net/parlez-vous-francais/>, accessed 23 Nov 2020)

The above examples suggest that this pattern is highly lexicalized, but it is not entirely unproductive, as parodies of the NBC show have demonstrated, e.g. a segment in the *Daily*

23 Cf. <https://www.themoreyouknow.com/> (accessed 23 Nov 2020)

24 Cf. <https://www.urbandictionary.com/define.php?term=the+more+you+know> (accessed 24 Nov 2020)

Show titled *The less you know*²⁵. Of course, it is questionable whether this is still a true CC, as an integral part – the C2 subclause that encodes the ‘effect’, or apodosis – is missing entirely, although one might argue that it is something along the lines of *the better*_{C2} that has been ‘truncated’ and is still implied. These structures will not be further investigated in the present study because like the Special Construction (see section 3.3.2), they appear to be very infrequent. Nevertheless, they are interesting from a constructional perspective, because they demonstrate that the CC pattern is subject to creative language use (the ‘input’ that resulted in *The more you know* was clearly the CC construction) beyond BE-deletion and truncation.

As with BE-deletion patterns, previous research based on data from BNC and COCA has identified various cross-clausal associations concerning truncation that are exclusively symmetric:

Cross-clausal truncation associations (COCA; Hoffmann et al. 2019: 19)

TRUNCATED_{C1} - TRUNCATED_{C2} (coll. Strength 68.297***)

FULL CLAUSE_{C1} - FULL CLAUSE_{C2} (coll. Strength 33.553***)

Cross-clausal BE-deletion associations (BNC; Hoffmann et al. 2020: 209)

TRUNCATED_{C1} - TRUNCATED_{C2} (coll. Strength 64.411***)

FULL CLAUSE_{C1} - FULL CLAUSE_{C2} (coll. Strength 58.365***)

Regarding variety-specific effects, previous studies based on data from the ICE corpus family have shown that “parallel retention, deletion and truncation in C1 and C2 as significantly favoured patterns across all varieties” (Hoffmann 2019: 220), such that “parallel C1-C2 meso-constructions are clearly significantly entrenched across all PCEs” (Hoffmann 2019: 221). In fact, Hoffmann could only determine one variety-specific effect (for SingE) by means of HCFA, although this finding has to be treated with a certain degree of caution, as it was “due to a specific meso-constructional template with *better* in C2” (2019: 221). However, as has been noted before, Hoffmann’s ICE data set was relatively small, so that a large-scale investigation is definitely warranted to test his findings and hopefully provide a more fine-grained picture.

From the previous studies discussed above (Hoffmann 2014a, 2019; Hoffmann et al. 2019, 2020), it can be expected that there will be a strong preference for symmetric deletion and truncation patterns, providing further evidence of a paratactic analysis of the PdE CC. Expanding on Hoffmann’s rather small ICE corpus study, it will also be interesting whether variety-specific and stage-specific effects can be determined. As with filler types, will be tested using HCFA (see section 2.1.1.1)

3.3.4 Filler type and deletion/truncation interactions

In addition to investigating interactions between lexical fillers and filler types (see sections 3.3.1 and 3.3.2), Hoffmann et al. (2019, 2020) also analyzed filler type-deletion/truncation interactions using covarying-collexeme analysis²⁶. They found various statistically significant cross-clausal associations, which can be seen as evidence of entrenchment – that is, ‘nodes’ in

25 Cf. <http://www.cc.com/video-clips/weokyy/the-daily-show-with-jon-stewart-the-less-you-know---message-force-multipliers> (accessed 23 Nov 2020)

26 Such interactions can be easily subjected to a covarying-collexeme analysis by “collapsing the factors FILLER TYPE C1 and DELETION C1 as well as FILLER TYPE C2 and DELETION C2” (Hoffmann et al. 2020: 203) before ‘feeding’ them to the R script.

the meso-constructural network – thereby providing an even more detailed impression of the English CC’s meso-constructural network. Thus, even though in theory, speakers are free to choose among the various filler types (see section 3.3.2) and deletion/truncation patterns (see section 3.3.3), it appears that “associations of these variables can also become entrenched” (Hoffmann et al. 2020: 210).

Considering the findings from previous studies with regard to filler type and deletion/truncation patterns, it is hardly surprising that again, both Hoffmann et al.’s COCA as well as their BNC studies turned up “significant parallel associations across C1 and C2” (2020: 210), further supporting a paratactic analysis of the PdE CC construction. A full list of the filler type-deletion/truncation interactions determined by Hoffmann et al. is not provided here due to their great number, but Hoffmann et al. conclude that in their COCA data, “six out of the nine significant DELETION × FILLER TYPE interactions have identical C1 and C2 structures” (2019: 22). Similarly, in their BNC data “6 of the 14 significant associations have perfectly identical factor combinations” (2019: 22), and “[o]f the remaining eight, six at least share one feature” (2020: 210). As with single-factor cross-clausal associations, entrenched interactions can be rendered using constructional templates, for example (3.38), which was suggested by Hoffmann et al. (2019: 28):

(3.38) **NP+FULL CLAUSE-NP+FULL CLAUSE CC construction** (Hoffmann et al. 2019)

FORM: [ðə []_{NP_comparative phrase1} clause₁]_{C1}
 [ðə []_{NP_comparative phrase2} clause₂]_{C2}
 MEANING: ‘[As the degree of comparative phrase1 increases/decreases
 with respect to clause₁]_{independent variable}
 → [so the degree of comparative phrase2 increases/decreases
 with respect to clause₂]_{dependent variable} in a monotonic way

A good way of illustrating such interactions in the meso-constructural network is Hoffmann et al.’s (2019) representation (Figure 3.1) that is based on their COCA data. Figure 3.1 shows how the various meso-constructions that could be determined using statistical analyses are related to each other: There are more abstract constructions (i.e., DELETION and FILLER TYPE associations across clauses) as well as more concrete constructions (FILLER) that “inherit from both the DELETION [...] as well as the FILLER TYPE [...] CC constructions” (Hoffmann et al. 2019: 31). Accordingly, the present study will also test the corpus data for filler type-deletion interactions to provide a more fine-grained picture of the meso-constructural network. This will be especially interesting with regard to PCEs, for which no study of such interactions remains to be conducted. In particular, it will be interesting to see whether there are variety-specific and DM stage-specific effects. Taking into account Hoffmann et al.’s (2019, 2020) findings, it can be expected that a majority of interactions across all varieties and stages will be symmetric. Moreover, based on the findings of Hoffmann’s ICE study (2019) that investigated filler types and deletion/truncation patterns separately, it seems likely that there are no variety-specific or stage-specific effects.

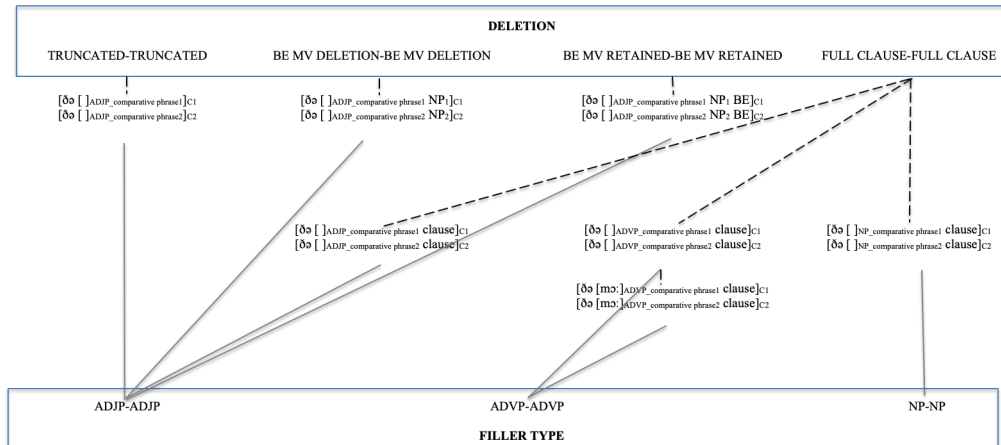


Figure 3.1 DELETION and FILLER TYPE interactions illustrated as a network, based on COCA data (from Hoffmann et al. 2019: 32)

3.4 Productivity of lexical filler slots

As was discussed in section 3.3.1, previous studies (Hoffmann 2014a,b; 2019) have suggested that there is a correlation between the Dynamic Model stage of a variety and the nature of its meso-constructional network, such that higher-stage varieties “make greater use of more abstract macro-constructions (which are largely schematic, that is more productive)” (Hoffmann 2014a: 174). Hoffmann’s evidence of this correlation comes from his ICE corpus study, which shows that the further along the DM cycle a variety is, the lower its ratio of significantly associated lexical filler pairs (determined by means of covarying-collexeme analysis) across C1 and C2 in relation to the overall amount of CC tokens. Concretely, Hoffmann found one significant cross-clausal lexical filler association in JamE (stage IV), three in PhilE (stage III), and none in BrE (2014b: 175; 2019: 224), concluding that “the variability of fillers in [BrE] is so high that no single combination of fillers turns out to be statistically significant” (Brunner and Hoffmann 2020: 7).

The results of Hoffmann’s ICE study led to the “constructional productivity hypothesis” (Brunner and Hoffmann 2020: 15), which posits that “varieties in low stages of the Dynamic Model show less productivity of [...] slots of [a] construction than varieties in high developmental stages” (Brunner and Hoffmann 2020: 9). In other words, the constructional productivity hypothesis predicts that varieties at lower DM stages rely more on specific lexical filler combinations, while varieties at higher DM stages rely less on such specific, substantive fillers. That is, the productivity of the lexical filler slots increases along the DM cycle, indicating that higher stages “make greater use of a macro-construction (and therefore less use of meso-constructions)” (Hoffmann 2014b: 176).

The present study will put this hypothesis to the test by calculating the ratio of significantly associated lexical filler pairs against the total amount of C1C2 tokens, that is, “by dividing the token number of significant meso-constructions by the overall number of tokens” (Hoffmann 2014b: 175) for each GloWbE variety. Furthermore, LNRE modeling will be used (see section 2.1.1.3). This method allows for a much more precise comparison of type and token frequencies between the GloWbE subcorpora, which vary considerably in size (recall Schmid and Küchenhoff’s criticism (cf. section 2.1.1.2) that in covarying-collexeme analysis, larger

samples will result in a higher amount of significant results). GloWbE is a corpus that features more varieties and a considerably larger data set than Hoffmann's ICE study, which relied on only 352 C1C2 tokens across 12 varieties (2014b: 173). Should the constructional productivity hypothesis hold true, then the GloWbE data should show that there is a correlation between DM stage and lexical filler slot productivity, such that higher-stage varieties have less (stage IV) or no (stage V) significantly associated filler pairs compared to stage III varieties. Furthermore, if the productivity hypothesis applies, we can also expect a higher proportion of significantly associated lexical filler pairs in the lower DM stages, such that the LNRE curves should be steeper for higher DM stages, thus indicating an increase in productivity along the DM cycle and, of course, providing evidence for a network with more macro-constructions in higher stages.

3.5 Prototypical fillers

Although in theory, constructions with slots such as the CC allow speakers to freely choose among lexical fillers, several studies²⁷ have shown that “New Englishes at lower stages of Schneider's cycle have repeatedly been found to prefer frequent over infrequent forms” (Brunner and Hoffmann 2020: 7). Brunner and Hoffmann offer a cognitive explanation for this correlation, suggesting that in lower DM stages, more frequent lexical fillers are “well-entrenched and thus allow for easy production even under the effects of [second language acquisition]” (2020: 8).

Thus, another hypothesis that Brunner and Hoffmann put forward in their study on the *way*-construction is the so-called “prototypical filler hypothesis” (2020: 9), which posits that “the less entrenched a variety is according to the Dynamic Model [i.e., the lower the stage it is in], the stronger the tendency will be to select prototypical, or frequent, fillers in constructional slots” (2020: 9). Using HCFA (see section 2.1.1.1), Brunner and Hoffmann found several significant two- and three-way associations between DM stages and constructional slots, each of which they assumed to “represent a separate node in the [...] constructional network” (2020: 21). We can therefore assume that the more such interactions can be found in a variety or stage, the more prototypical fillers it has. And indeed, Brunner and Hoffmann's investigation of the *way*-construction using data from GloWbE confirmed the prototypical filler hypothesis. They were able to conclude that “varieties in early stages [of the DM] rely on [...] prototypical, obvious and frequent verbs [...] and prepositions [...]” (2020: 27).

Originally, with Brunner and Hoffmann's approach in mind, it was intended to use HCFA to determine significant interactions between the C1 and C2 lexical filler slots (instead of the verbal and prepositional slots that Brunner and Hoffmann analyzed) and DM stages. However, this was not possible, because the HCFA 3.2 script repeatedly crashed. The reason is that, according to Gries, the data “is completely ‘ineligible’ for [HCFA], given the huge numbers of levels (>1200) in both columns 1 [LEXICAL FILLER C1] and 2 [LEXICAL FILLER C2]” (Gries p.c. in February 2021). Because “nearly 95% of the cell frequencies in the input table are <=2” (Gries p.c. in March 2021), it was decided to exclude hapaxes from the analysis, thereby greatly reducing the data set size²⁸. The present study will thus be the

27 See Brunner and (Hoffmann 2020: 7) for an overview.

28 I would like to thank my supervisor Thomas Hoffmann for pointing out this alternative.

first to employ HCFA to test for variety-specific lexical filler interactions, as in the context of Hoffmann's ICE study it "was not possible to run a HCFA²⁹" because his data contained a "low token numbers of specific [lexical fillers]" (2014b: 173). If the prototypical filler hypothesis holds true, a HCFA³⁰ should reveal more significant lexical filler interactions in lower DM stages and less in the higher ones.

3.6 Asymmetric encoding

So far, the focus has been on quantitative differences between CCs across English varieties. However, there are also qualitative differences. One of the most striking examples concerns clause-initial elements. Recall the examples from section 1.4 (taken from Hoffmann 2019), repeated here as (3.39) and (3.40):

(3.39) [*as the more he thought*]_{C1} [*the more confused he gets*]_{C2}
(ICE-NG: W1A-50)

(3.40) [*the longer you delay*]_{C1} [*then the less unfortunate it will be for Singapore*]_{C2}
(ICE-SIN: S1B-025)

Examples (3.39) and (3.40) show qualitative innovations in C1 and C2, where either *as* is added to C1 so that it precedes the clause-initial *the*, or *then* is added to C2, so that it precedes the clause-initial *the* of that clause. Such structures are interesting not only because of their formal properties, with "innovations that depart more significantly from the exonormative input" (Hoffmann 2019: 227). From a semantic perspective, they appear to encode the asymmetric meaning carried by the CC construction, "in a way that emphasizes the semantic subordination of C1 as the independent variable to the dependent variable C2" (Hoffmann 2019: 227). Both of these features, *as* in C1 and *then* in C2 will be addressed by one of the psycholinguistic experiments carried out in the context of the present study.

Note that Hoffmann also discusses the following examples (3.41-3.42), where the comparative element is missing from C1 altogether (2019: 226-228):

(3.41) [*as you a mother express the milk*]_{C1} [*the more milk is made*]_{C2}
(ICE-KEN: br-talkk)

(3.42) [*as the incident angle increases away from the normal*]_{C1} [*the smaller the specular response.*]_{C2}
(ICE-GB: W2A-036 #23:1)

As Hoffmann plausibly argues, in these structures the "main verbs have a lexical meaning that denotes a semantic differential of increase" (2019: 228), thereby 'replacing' the comparative element. However, since Hoffmann found very few such examples in his ICE corpus data, and because retrieving them would have considerably complicated the programming of Thomas Brunner's *R* scripts for retrieving CCs (see chapter 2), the present

29 Instead, Hoffmann resorted to covarying-collexeme analysis, "which employs a Fisher-Yates Exact test and can therefore also be applied to low frequency data" (2014b: 173). This approach, however, only allowed him to determine whether and how many significantly associated lexical filler patterns a variety had. Subsequently, he used these results to calculate ratios of lexical filler associations over total sample size, a rather rudimentary method.

30 Note that the HCFA 3.2 script for *R* that was employed automatically corrects for sample size differences (see chapter 2, section 2.1.1.1), so that it can be used to analyze the data from GloWbE, which has different subcorpora sizes (see the discussion in section 3.4 above).

study will focus only on structures in which the comparative element is retained, e.g. (3.39) and (3.40).

Examples of the innovative addition of *as* and *then* to the clause-initial elements can be found in many varieties of English. The following examples of *as* in C1 show that this is a phenomenon that occurs across all DM stages, with tokens from BrE (3.43), CanE (3.44), IrE (3.45), AusE (3.46), SAfE (3.47), SingE (3.48), NigE (3.49), GhE (3.50), PhilE (3.51), and PakE (3.52):

Stage V

- (3.43) *The trend is as expected - [as more turbines are built,]_{C1} [the more accidents occur.]_{C2}*
(GLOWBE-GB ##775863)
- (3.44) *Horror stories about hair thinning usually are linked to stress, [as our lives and world becomes busier]_{C1} [the more stressed we are.]_{C2}*
(GLOWBE-CA ##3371138)
- (3.45) *Website Complexity affects Governance in the sense that [as a site becomes more intricate,]_{C1} [the more specialised become the skills that are needed to look after it.]_{C2}*
(GLOWBE-IE ##1647253)
- (3.46) *All she wants is to be with Chief and [as the stress of her Rampancy builds]_{C1} [the more mistakes she makes.]_{C2}*
(GLOWBE-AU ##3291904)

Stage IV

- (3.47) *I know that [as mother's milk increases]_{C1} [the more the infant is fed from the breast]_{C2}*
(GLOWBE-ZA ##3598536)
- (3.48) *[As your miles increase]_{C1a} and [as you travel more]_{C1b} [the more you will eventually become 'elite' members]_{C2}*
(GLOWBE-SG ##1032092)

Stage III

- (3.49) *The paradox of our time is that [as things become increasingly complex,]_{C1} [the more we need simplicity]_{C2}*
(GLOWBE-NG ##3607379)
- (3.50) *Yeah, it gets harder because [as I grow]_{C1} [the more the responsibilities become]_{C2}*
(GLOWBE-GH ## 1260349)
- (3.51) *Conventional theory suggests that, [as people get richer,]_{C1} [the more they demand better service.]_{C2}*
(GLOWBE-PH ##1091689)

Stage II

- (3.52) *But rather, this is one of the most dangerous things since [as a sin gets more and more despicable,]_{C1} [the more and more people will try to stay away from that sin]_{C2}*
(GLOWBE-PK ##955079)

The use of *as* has been discussed in detail by Hoffmann, who assumes that this lexical item is “semantically related to CCs” due to its “protasis meaning” (2019: 227). Thus, the use of *as* can be explained by the “parallel activation of semantically related constructions in a constructional network [which] can lead to the production of such double-bind constructs” (2019: 228).

The use of *then* in C2 was also found across varieties from all DM stages, including AmE (3.53), NZE (3.54), JamE (3.55), SingE (3.56), SAfE (3.57), GhE (3.58), IndE (3.59), PakE (3.60), and BangE (3.61):

Stage V

(3.53) [*The less integrated an individual is*]_{C1} [**then** *the more the tendency will be towards envy and spoiling*]_{C2}

(GLOWBE-US ##1397529)

(3.54) *In fact, the opposite may be true: [the less a country is propped up by external actors,]_{C1a} and [the more it is forced to look inside itself for solutions,]_{C1b} [**then** *the more it may eventually address the root causes of its backwardness, decline or stagnation*]_{C2}*

(GLOWBE-NZ ##1761294)

Stage IV

(3.55) [*The more you have*]_{C1} [**then** *the more likely at least one will ‘mount to something’*]_{C2}

(GLOWBE-JM ##1356551)

(3.56) *Also, [the more uncomfortable the shoes are (new ones tend to be when first worn),]_{C1} [**then** *the more likely you’ll blister and such.*]_{C2}*

(GLOWBE-SG ##1016483)

(3.57) *Over the years GEM has shown that [the more educated a person is, irrespective of gender or race,]_{C1} [**then** *the more likely they are to start a business and succeed*]_{C2}*

(GLOWBE-ZA ##3599115)

Stage III

(3.58) *don’t you know that [the more we can give education to our people,]_{C1} [**then** *the more jobs can be created hence more taxes.*]_{C2}*

(GLOWBE-GH ##1236045)

(3.59) [*The more links you get*]_{C1} [**then** *the more you will be better placed in the search results.*]_{C2}

(GLOWBE-IN ##3398617)

Stage II

(3.60) [*the more aggressive you are with your clients when they don’t pay you,]_{C1} [**then** *the more profitable you will be*]_{C2}*

(GLOWBE-PK ##959183)

(3.61) [*The better you complete the tasks*]_{C1} [**then** *the more money you get.*]_{C2}

(GLOWBE-BD ##1009883)

As noted by Hoffmann, “the use of *then* [...] has the effect of overtly marking the second clause as the apodosis”, which implies “iconic marking” (2019: 229). However, he also suggests that Asian L2 varieties might be particularly susceptible to this phenomenon due to adstrate/substrate effects: In Mandarin Chinese, “comparative correlatives optionally allow for the element *jiù* ‘then’ to link C1 and C2” (2019: 229, referring to Lin 2007). This has led to Hoffmann (2019: 229-230) speculating about whether in addition to processing factors, the use of *then* in CCs in SingE (and HKE, which, however, is not investigated in the present study) might be influenced by the interaction of the constructional networks of English and Mandarin Chinese in bilingual speakers. He concedes, however, that his ICE corpus data yielded too few tokens to “make any definitive claims” (2019: 230), calling for further

research. Thus, one of the psycholinguistic experiments carried out in the present study was designed to further investigate the use of *then* (and *as* in C1, for that matter) across varieties from different DM stages.

In this context it is noteworthy that the fact that creative structures using *as* in C1 and *then* in C2 can also be found in stage V varieties suggests that this is a phenomenon not restricted to non-standard varieties. However, in the light of the discussion above (substrate influence), it appears likely that these phenomena might be preferred in SingE, the only Asian variety that the psycholinguistic experiments tested. In the context of the DM, it would also be plausible if speakers of lower-stage varieties (i.e., SingE, CSAfE, BSAfE, KenE) rate asymmetric structures with *as* and *then* better than speakers of stage V varieties (AmE, WSAfE): Recall that in stage III (Nativization) in particular, Schneider claims there is an “increased amount of interaction [that] produces the emergence of structures distinctive to the newly evolving variety” (Schneider 2014: 11), which could also include asymmetric structures with *as* and *then*.

Against the background of Mesthrie’s deleters vs. preservers theory and Kortmann’s L1–L2 continuum, it will also be interesting to see whether there are any DM stage-specific effects. If the deleters vs. preservers claim holds true, the African varieties should actually prefer the use of ‘extra’ elements such as *as* and *then*; if Kortmann’s theory about an L1–L2 continuum applies, however, there should be an effect across DM stages such that ‘non-standard’ structures using *as* and *then* should be rated worse in stage V varieties (in the present investigation, AmE and WSAfE). On a final note, asymmetric encoding with *as* and *then* is used in more complex CC constructions of the type discussed in section 3.2.2. Examples (3.48) and (3.54) are both Type A stacked constructions (C1a and C1b → C2, see above), indicating that asymmetric encoding is part of the ‘greater’ CC network of constructions.

Of course, different clause-initial elements and the omission of comparative elements also make such structures difficult to investigate in a corpus study. They cannot be extracted from corpora using the ‘standard’ CC queries that were employed in the present study. These contained *the* as fixed clause-initial elements and an obligatory comparative element slot (see sections 2.3.1.1–2.3.1.3), so that a separate regular expression would have to be used for retrieving creative patterns such as the ones provided above. This would have been beyond the scope of the present investigation, so it was decided to focus on the clause-initial elements in a psycholinguistic experiment, with test items created based on examples from corpora such as the ones above.

4 Corpus study results

[A]n empiricist approach to language is dominated by the observation of naturally occurring data, typically through the medium of the corpus. In this case, we may decide to determine whether sentence x is a valid sentence of language y by looking in a corpus of the language in question and gathering evidence for the grammaticality, or otherwise, of the sentence.

McEnery and Wilson (2001: 5)

As discussed in chapter 2, the point of departure for any description of the mental grammar of a language are the type and token frequencies of constructions in naturalistic corpus data, which constitute evidence for the entrenchment of constructions (cf. Gries 2013). In the context of the present study, the type and token frequencies of CCs and variants thereof can thus help uncover meso-constructions, or ‘nodes’ in the network, and ultimately reveal the shape of the overall meso-constructional network underlying the documented use of language. In previous studies (Hoffmann 2013; 2014a,b; 2018, 2019; Hoffmann et al. 2019; 2020), this methodology has repeatedly proved its viability, and shed light on the English CC network. However, each of these studies highlighted only specific aspects of the English CC.

For example, in their COCA study Hoffmann et al. (2019) investigated filler types, lexical fillers, and deletion phenomena, but did not look at clause order, subject-auxiliary inversion, or *that*-complementizers, on which they focused in their BNC study (2020). Thus, while each of these studies revealed interesting aspects of the American English and British English CC networks, an incomplete picture of both varieties remains. Also, evidence from other varieties of English is sparse, with Hoffmann’s ICE corpus studies (2014a,b, 2017b, 2019) based on comparatively small data sets of only a few dozen CC tokens. The aim of the present study is to address this shortcoming, and to provide a much more comprehensive picture of the English CC network, filling the gaps left by previous studies.

This chapter presents the results of a corpus study based on data from three corpora: BNC, COCA, and GloWbE¹. Note that the BNC data set consists of *all* CC tokens that could be extracted from the corpus, whereas the COCA and GloWbE data sets are random samples – in the case of GloWbE, stratified to account for the different variety component sizes. The investigated syntactic variables, discussed in detail in chapter 3, are the hypotactic features *that*-complementizers (4.1.1) and subject-auxiliary inversion (4.1.2), the clause order phenomena non-iconic C2C1s (4.2.1) and stacked C1C2C3... structures (4.2.2), cross-clausal associations regarding lexical fillers (4.3.1), filler types (4.3.2), deletion and truncation phenomena (4.3.3), constructional slot productivity (4.4), and prototypical fillers (4.5). While in theory, the ‘two-pronged’ approach (corpus investigation corroborated by introspection experiments) that has been advocated previously (see chapter 2) could be applied to several of these syntactic features, the scope of the present study did not allow for all variables to be investigated in this way. Thus, only *that*-complementizers were also included in the introspection experiments (see chapter 5), although in the experiments investigating asymmetric encoding, test items were based on examples found in corpora.

¹ All data sets used in this chapter are available in an OSF repository that is accessible via the following link: <https://osf.io/qar62/>

4.1 Hypotactic features

4.1.1 *That*-complementizers

As discussed in section 3.1.1, optional *that*-complementizers have often been used to support the claim that C1 is subordinate to C2, which is considered to have main clause status. This in turn has been used as evidence that PdE CCs are hypotactic structures. However, as the corpus data will show, *that*-complementizers as well as subject-auxiliary inversion (see section 4.1.2 below) can only be considered a marginal, hardly entrenched feature of PdE CCs, a “historical relict (sic) that plays almost no role in PdE” (Hoffmann 2019: 126). Nevertheless, examples of *that*-complementizers in C1 could be found in all three corpora – COCA (4.1), BNC (4.2), and GloWbE (4.3). There were also examples of *that*-complementizers in C2 (4.4-4.7), and very few instances, no more than five across all corpora, of *that*-complementizers in both C1 and C2 (4.8-4.9).

- (4.1) [*The more **that** a school emphasizes publishing papers, or searching out patentable technology,*]_{C1}
 [*the less it emphasizes access and commitment to students.*]_{C2}
 (COCA wlp_magazine_qri/wlp_mag_2001 ##2039019 Line: 62)
- (4.2) *Now then,* [*the faster **that** we can do this,*]_{C1} [*the faster we get on with the game.*]_{C2}
 (BNC S_classroom JA8) (from Hoffmann et al. 2020: 204)
- (4.3) [*The longer **that** cross-asset correlations persist,*]_{C1}
 [*the greater the tendency for investors to “use” them.*]_{C2}
 (GLOWBE-AU wlp_au_kso/wlp_au_g01 general ##206010 Line: 20)
- (4.4) *Indeed,* [*the more we look at this multicolored, upright band,*]_{C1}
 [*the more **that** it suggests the reverse side of the painting at which we are looking, reflected, along with the artist’s face, in the act of its making and seeing.*]_{C2}
 (COCA wlp_academic_rpe/wlp_acad_2002 ##4011275 Line: 88)
- (4.5) [*the larger the new settlement becomes,* [I] *think,*]_{C1}
 [*the less **that** the reduced number of sites you will have available to accommodate [...] that proposal.*]_{C2}
 (BNC S_pub_debate HVK)
- (4.6) [*The more investors that jump the ship,*]_{C1} [*the more **that** the market becomes volatile.*]_{C2}
 (GLOWBE-CA wlp_ca_usi/wlp_ca_g01 general ##119913 Line: 38)
- (4.7) *And, with financial aid formulas,* [*the more money **that**’s in your child’s name*]_{C1}
 [*the less aid **that** they are going to qualify for*]_{C2}
 (COCA wlp_spoken_kde/wlp_spok_1999 ##232237 Line: 39) (from Hoffmann 2019: 125)
- (4.8) [*The quicker **that** this matter be addressed in an appropriate forum,*]_{C1}
 [*the quicker **that** you can resolve the real issues.*]_{C2}
 (GLOWBE-CA wlp_ca_usi/wlp_ca_g01 general ##149216 Line: 44)
- (4.9) [*The more **that** the world population gets educated,*]_{C1}
 [*the less likely **that** that they will be radical extremists.*]_{C2}
 (GLOWBE-US wlp_us_blog_qri/wlp_us_b01 ##3251113 Line: 19)

It has been noted before that some *that*-complementizers in C2 could be analyzed as “a special type of truncation [...] in which only subject and verb (but not the remaining complement) are deleted” (Hoffmann 2019: 125). Thus, C2 in (4.9) could be analyzed as

missing *it is*: [*the less likely it is that they will be radical extremists.*]_{C2} Such an analysis, however, is not always possible, as example (4.8) shows: [*the quicker ?it is that you can resolve real issues.*]_{C2} Thus, at least for example (4.8), the presence of a *that*-complementizer in the C2 clause must be assumed. Similarly, the C2 clauses in (4.7) and (4.9) possibly also contain a *that*-complementizer.

Because there are conflicting views in the literature (cf. section 3.1.1) about the possibility and acceptability of *that*-complementizers in C1 and C2, the corpus data was coded as indicated in Table 4.1 below:

Table 4.1 Coding of the variable *THAT-COMPLEMENTIZER*

Factors	Levels
THAT-COMPLEMENTIZER C1	TRUE, FALSE
THAT-COMPLEMENTIZER C2	TRUE, FALSE

In the following, the results from COCA (4.1.1.1), BNC (4.1.1.2), and GloWbE (4.1.1.3) will be presented in detail.

4.1.1.1 *That*-complementizers in COCA

The COCA sample² used for the present study consisted of 1,409 C1C2 tokens. Table 4.2 shows that in this data set, *that*-complementizers are four times as common in C1 (24 tokens, 1.70%) as in C2 (6 tokens, 0.43%). This is hardly surprising, considering that *that*-complementizers are remnants of an earlier hypotactic structure where C1 was the subordinate clause and C2 the main clause. The preference for *that*-complementizers in C1 supports claims from introspective studies about them being ungrammatical or strongly dispreferred in C2. However, even in C1 the phenomenon can be described as marginal at best, as is also evident from Figure 4.1, which shows how many *that*-complementizers were found in C1 and C2. The Chi-squared test provides further evidence for this claim, showing that the dispreference for *that*-complementizers in C1 is statistically significant ($\chi^2=1314.64$, $df=1$, $p<0.001$). The same applies to *that*-complementizers in C2 ($\chi^2=1385.10$, $df=1$, $p<0.001$). Furthermore, there were two instances of a *that*-complementizer in *both* C1 and C2 (0.14%) in the COCA data. Since the observed frequency of such cases was <5 , a Chi-squared test cannot be assumed to yield a reliable result³.

To test the entrenchment of *that*-complementizers in AmE, a covarying-collexeme analysis was carried out on the COCA data set by Hoffmann (2019). The results are provided in Table 4.3. They show that “[b]y far the most significantly associated pattern” is the one in which no *that*-complementizers are used in either C1 or C2, with a collostructional strength of 2.398** (Hoffmann 2019: 126). This underscores the marginal status of *that*-complementizers in PdE CCs, and thus also the strong preference for symmetric patterns, *contra* claims in the literature that CCs are hypotactic structures.

2 The same data set was also used by Hoffmann (2019: 124-26).

3 As noted by Hoffmann (2019: 112, cf. also Gries, who refers to an expected frequency of ≥ 5 as a “conservative threshold value” (2009: 166)).



Figure 4.1 THAT-COMPLEMENTIZERS in COCA

Table 4.2 THAT-COMPLEMENTIZERS in C1 and C2, COCA

THAT-c.	Tokens in C1	Tokens in C2	Tokens in C1 and C2
TRUE	24	6	2
FALSE	1385	1403	1407
Total	1409	1409	1409

Table 4.3 Covarying-collexeme analysis of that-complementizers across C1 and C2 in COCA, from Hoffmann (2019: 125)

THAT-c. C1	THAT-c. C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	FALSE	1385	1403	1381	1379.1	attraction	2.398	**
TRUE	TRUE	24	6	2	0.1	attraction	2.398	**
FALSE	TRUE	1385	1403	4	5.9	repulsion	2.398	**
TRUE	FALSE	24	6	22	23.9	repulsion	2.398	**

Finally, it was decided to explore the distribution of C1 *that*-complementizers across COCA registers. From Table 4.4 and Figure 4.2, which show raw frequencies and percentages, it is evident that *that*-complementizers are more frequent in the spoken register, making up exactly half (12/24 tokens) of the total. This contradicts the assumption made in section 3.1.1, that is, that speakers will avoid less entrenched features such as *that*-complementizers in C1 since speech is spontaneous and unplanned.

A covarying-collexeme analysis, whose results are shown in Table 4.5, confirms that *that*-complementizers are preferred in the spoken register of COCA. There were no significant effects, with the exception of the spoken register, which shows a strong repulsion (collostructional strength: 4.32***) of no *that*-complementizers in C1. Thus, it appears that

that-complementizers are actually preferred in spoken language, an observation that also applies to the BNC data (see section 4.1.1.2 below).

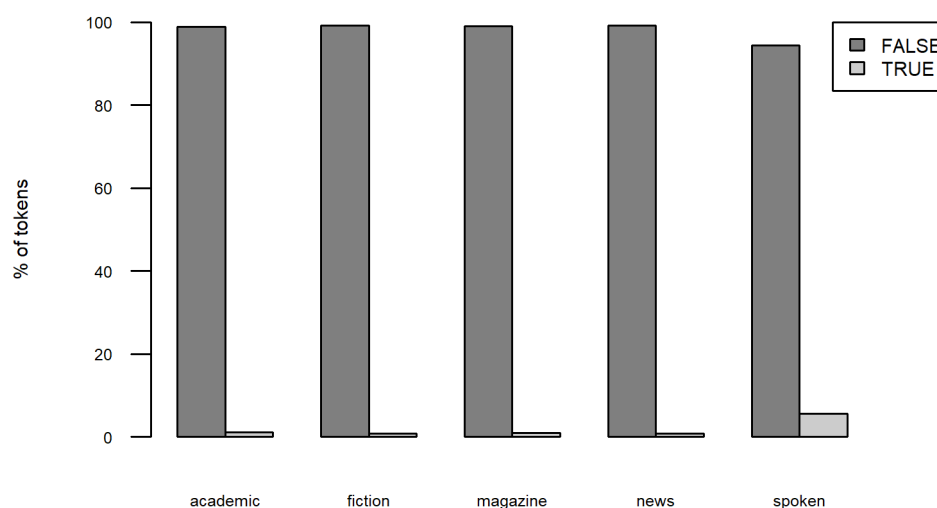


Figure 4.2 C1 THAT-COMPLEMENTIZERS by COCA register

Table 4.4 Distribution of C1 THAT-COMPLEMENTIZER tokens by COCA register

THAT-c. C1	Academic	Fiction	Magazine	News	Spoken
FALSE	274	222	475	215	199
TRUE	3	2	5	2	12
Total	277	224	480	217	211

Table 4.5 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS across COCA registers (expected frequency ≥ 5)

THAT-c. C1	COCA REG.	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	magazine	1385	480	475	471.82	attraction	0.920	n.s.
FALSE	fiction	1385	224	222	220.18	attraction	0.621	n.s.
FALSE	news	1385	217	215	213.3	attraction	0.585	n.s.
FALSE	academic	1385	277	274	272.28	attraction	0.560	n.s.
FALSE	spoken	1385	211	199	207.41	repulsion	4.315	***
TRUE	magazine	24	480	5	8.18	repulsion	0.919	n.s.

4.1.1.2 That-complementizers in BNC

The *that*-complementizer frequencies in the BNC data (2,041 C1C2 tokens) show many parallels to COCA. Table 4.6 reveals an overall very low frequency of *that*-complementizers, but a clear preference for them in C1 (29, 1.42% of total tokens) over C2 (2, 0.10% of total tokens), which is also evident from Figure 4.3. The Chi-squared test shows that the

dispreference for *that*-complementizers in C1⁴ is statistically significant ($\chi^2 = 1926.65$, $df=1$, $p<0.001$), as also noted by Hoffmann et al. (2020: 205). Instances of *that*-complementizers in *both* C1 and C2 were not found in the BNC data.

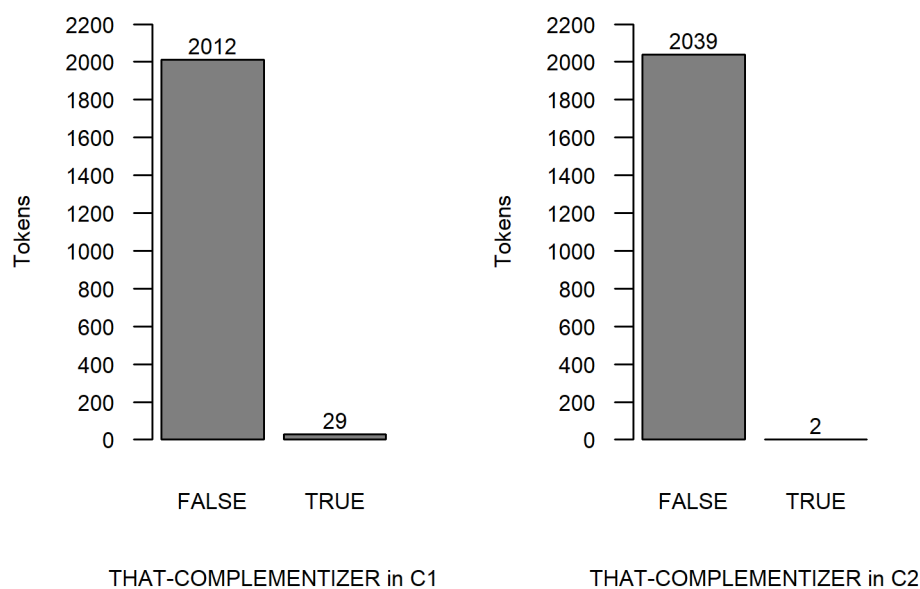


Figure 4.3 THAT-COMPLEMENTIZERS in BNC

Table 4.6 THAT-COMPLEMENTIZERS in C1 and C2, BNC (Hoffmann et al. 2020: 205)

THAT-c.	Tokens in C1	Tokens in C2	Tokens in C1 and C2
TRUE	29	2	0
FALSE	2012	2039	0
Total	2041	2041	0

Hoffmann et al. note that in the BNC data set, “[b]oth instances of *that*-complementizers in C2 are from the spoken part of the corpus” (2020: 205), which would be in line with claims that the use of *that*-complementizers in C2 is restricted to colloquial English (as suggested by Hoffmann 2014a: 96). In contrast to the COCA data (see above), a covarying-collexeme analysis of the BNC data reveals no statistically significant effects, with a very low collostructional strength of 0.01 (i.e., $p>0.05$) for every combination, as Table 4.7 shows. The reason for this, according to Hoffmann et al. (2020: 205), could be the overall dispreference of *that*-complementizers that the Chi-squared test revealed (see above).

Similar to COCA, the distribution of *that*-complementizers across BNC modes was also explored. Table 4.8 and Figure 4.4 show the distribution of tokens across the BNC written/spoken modes. The results of the covarying-collexeme analysis, whose results are provided in Table 4.9, confirm the findings from COCA, that is, *that*-complementizers are preferred in the spoken register: There were strong effects (4.47***) for each combination⁵. In

4 The observed frequency of *that*-complementizers in C2 being <5, a Chi-squared test was not carried out (see section 4.1.1.1).

other words, there was a strong repulsion of C1 *that*-complementizers to the written mode, and a strong repulsion of no *that*-complementizers to the spoken mode.

Table 4.7 Covarying-collexeme analysis of that-complementizers across C1 and C2 in BNC

THAT-c. C1	THAT-c. C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	FALSE	2012	2039	2010	2010.03	repulsion	0.012	n.s.
TRUE	TRUE	29	2	0	0.03	repulsion	0.012	n.s.
FALSE	TRUE	2012	2	2	1.97	attraction	0.012	n.s.
TRUE	FALSE	29	2039	29	28.97	attraction	0.012	n.s.

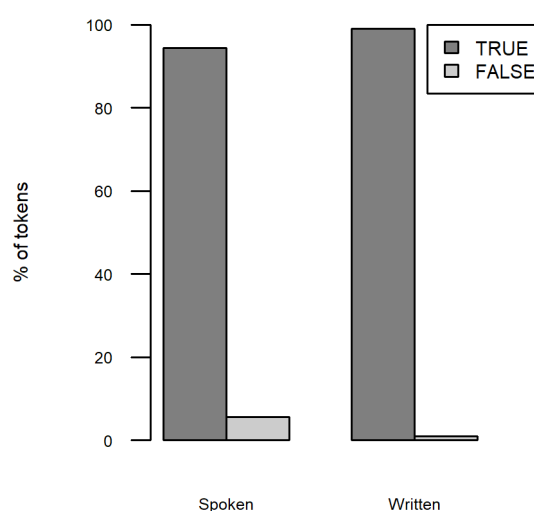


Figure 4.4 C1 THAT-COMPLEMENTIZERS by BNC mode

Table 4.8 C1 THAT-COMPLEMENTIZERS by BNC mode

THAT-c. C1	Spoken	Written
FALSE	184	1828
TRUE	11	18
Total	195	1846

Table 4.9 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS across BNC modes (expected frequency ≥ 5)

THAT-c. C1	COCA REG.	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	Written	2012	1846	1828	1819.77	attraction	4.469	***
FALSE	Spoken	2012	195	184	192.23	repulsion	4.469	***
TRUE	Written	29	1846	18	26.23	repulsion	4.469	***

5 Note that the combination TRUE – Spoken was dropped from Table 4.9 as it had an expected frequency of 2.77, which is ≥ 5 .

4.1.1.3 *That*-complementizers in GloWbE

The GloWbE data set consists of 5,715 C1C2 tokens, which is considerably more than the COCA (1,409 C1C2 tokens) and BNC (2,041 C1C2 tokens) data sets. The proportion of *that*-complementizers in the GloWbE data is very low, reflecting the state of affairs in the BNC and COCA data. All in all, 55 instances (0.96%) of *that*-complementizers were found in C1, and 9 (0.16%) in C2. A Chi-squared test confirms that the dispreference of *that*-complementizers in C1 ($\chi^2=5497.1$, $df=1$, $p<0.001$) and in C2 ($\chi^2=5679.1$, $df=1$, $p<0.001$) is statistically significant. Furthermore, the GloWbE data contained only one token (0.017%) with a *that*-complementizer in both C1 and C2, which was from the stage V variety CanE. Table 4.10 provides an overview of *that*-complementizers in the GloWbE data.

Table 4.10 *THAT-COMPLEMENTIZERS in C1 and C2, GloWbE (all varieties)*

THAT-c.	Tokens in C1	Tokens in C2	Tokens in C1 and C2
TRUE	55	9	1
FALSE	5660	5706	5714
Total	5715	5715	5715

Like the COCA and BNC data, the GloWbE data was subjected to a covarying-collexeme analysis. Table 4.11 shows the results; as with the BNC data, no significant effects could be determined.

Table 4.11 *Covarying-collexeme analysis of THAT-COMPLEMENTIZERS across C1 and C2 in GloWbE*

THAT-c. C1	THAT-c. C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	FALSE	5660	5706	5652	5651.09	attraction	1.079	n.s.
TRUE	TRUE	55	9	1	0.09	attraction	1.079	n.s.
FALSE	TRUE	5660	9	8	8.91	repulsion	1.079	n.s.
TRUE	FALSE	55	5706	54	54.91	repulsion	1.079	n.s.

Of course, these results do not take into account the individual GloWbE varieties. Considering the objectives of the present study, it will therefore be interesting to take a look at the distribution of *that*-complementizers across varieties and DM stages to see whether *that*-complementizers are a feature exclusive of the standard varieties, and whether there are any variety-specific effects. A first impression can be obtained from the raw frequencies. Tables 4.13 and 4.14, and Figures 4.5, 4.6, 4.7, and 4.8 show the very low frequency of C1 and C2 *that*-complementizers across all GloWbE varieties. However, as Table 4.15 and Figures 4.9 and 4.10 show, despite this overall low frequency, *that*-complementizers are a phenomenon that is mostly restricted to stage V varieties, to which 40 out of 55 C1 tokens (72.72%) and five out of nine C2 tokens (55.55%) can be attributed. This confirms the findings of Hoffmann's ICE study, which revealed that while "[C1] *that*-complementizers occasionally surface in L1 stage V varieties (as a weak indication that C1 used to be syntactically subordinate to C2)", "[s]tage IV and III L2 varieties exhibit an even stronger paratactic

relationship between C1 and C2”, reflected by the considerably lower frequency of *that*-complementizers in those varieties (2019: 210).

The results of the covarying-collexeme analysis⁶ are summarized in Table 4.12, which shows that the absence of C1 *that*-complementizers shows a strong attraction to stage III varieties, with a significant collostructional strength of 2.08**. The collostructional strength of the attraction of stage V varieties to *that*-complementizers in C1 falls just short of the significance threshold, but does indicate a tendency. Stage IV varieties do not show any significant effects, with the collostructional strength for attraction and repulsion of *that*-complementizers in C1 below the threshold of 1.31 ($p \geq 0.05$). Neither could any significant effects be determined for stage II varieties.

Table 4.12 Covarying-collexeme analysis of C1 THAT-COMPLEMENTIZERS and DM stage

THAT-c. C1	DM Stage	Freq. THAT-c. C1	Freq. DM Stage	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	III	5660	1420	1414	1406.33	attraction	2.081	**
TRUE	V	55	3504	40	33.72	attraction	1.287	n.s.
TRUE	IV	55	479	7	4.61	attraction	0.759	n.s.
FALSE	II	5660	312	310	309	attraction	0.382	n.s.
TRUE	III	55	1420	6	13.67	repulsion	2.081	**
FALSE	V	5660	3504	3464	3470.28	repulsion	1.287	n.s.
FALSE	IV	5660	479	472	474.39	repulsion	0.759	n.s.
TRUE	II	55	312	2	3	repulsion	0.382	n.s.

In summary, it can be said that *that*-complementizers are a phenomenon with a very low frequency. In all three corpora – COCA, BNC, and GloWbE – they never make up more than 2% of all tokens. Thus, the results of the corpus study presented here confirm the findings of Hoffmann’s ICE corpus study (2014b, 2019), which he summarizes as follows: “*That*-complementizers are [...] strongly disfavoured across all varieties (highlighting the more paratactic marking of C1 and C2), [...] this effect is even more pronounced in stage IV and V varieties” (2019: 208). The covarying-collexeme analysis of the GloWbE data thus confirms Hoffmann’s conclusion, based on his covarying-collexeme analysis of COCA data (cf. Table 4.3) that “[b]y far the most significantly associated pattern is one in which neither clause exhibits a [*that*-complementizer]” (2019: 126).

This finding also has implications for claims about a hypotactic relationship between C1 and C2 (claimed by e.g. Borsley 2004, den Dikken 2005), which are difficult to maintain in light of the extremely low frequency of *that*-complementizers, a fact also noted by Hoffmann (2019: 126). Rather, all the evidence laid out here clearly supports a paratactic analysis of PdE CCs, having retained only a few hypotactic features from earlier stages of the language. A similar conclusion can be drawn for Subject-auxiliary inversion (SAI), the second hypotactic feature that was part of the corpus study and whose results will be discussed in section 4.1.2 below.

⁶ Due to the extremely low frequency of C2 *that*-complementizers – no DM stage had an observed frequency ≥ 5 – this variable was not included in the covarying-collexeme analysis.

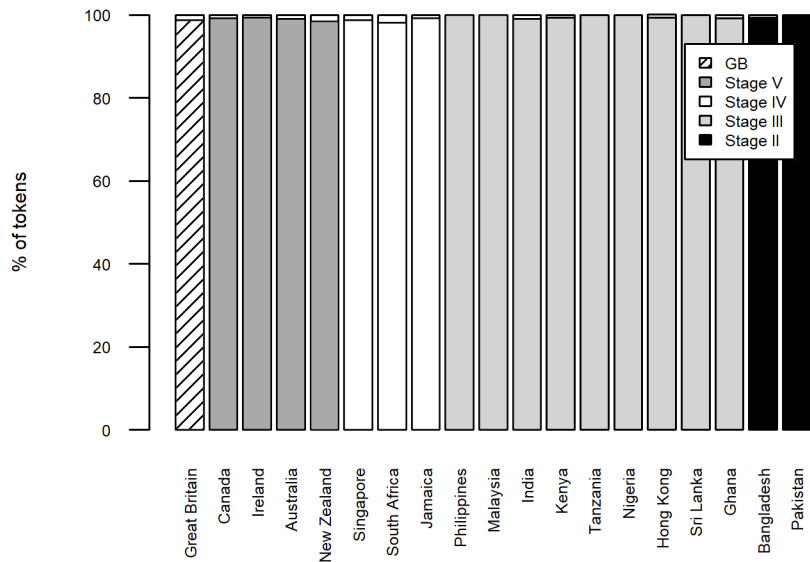


Figure 4.6 Percentage of THAT-COMPLEMENTIZER C1 tokens by GloWbE variety

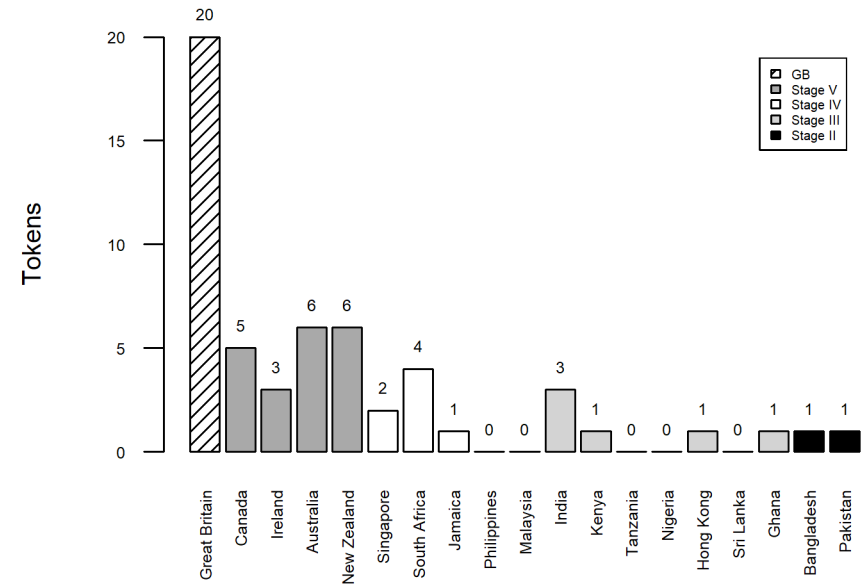


Figure 4.5 Total number of THAT-COMPLEMENTIZER C1 tokens by GloWbE variety

Table 4.13 THAT-COMPLEMENTIZER C1 tokens by GloWbE variety, grouped according to DM stage

THAT-COMP. C1	Stage V					Stage IV			Stage III									Stage II	
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
TRUE	20	5	3	6	6	2	4	1	0	0	3	1	0	0	1	0	1	1	1
FALSE	1531	567	388	624	354	158	198	116	176	157	311	137	99	160	153	110	111	137	173
Total	1551	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174

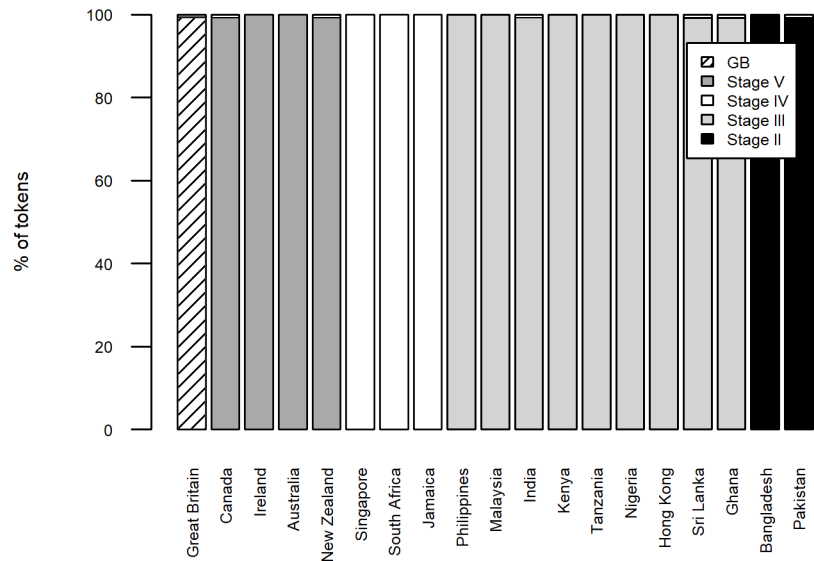


Figure 4.7 Percentage of THAT-COMPLEMENTIZER C2 tokens by GloWbE variety

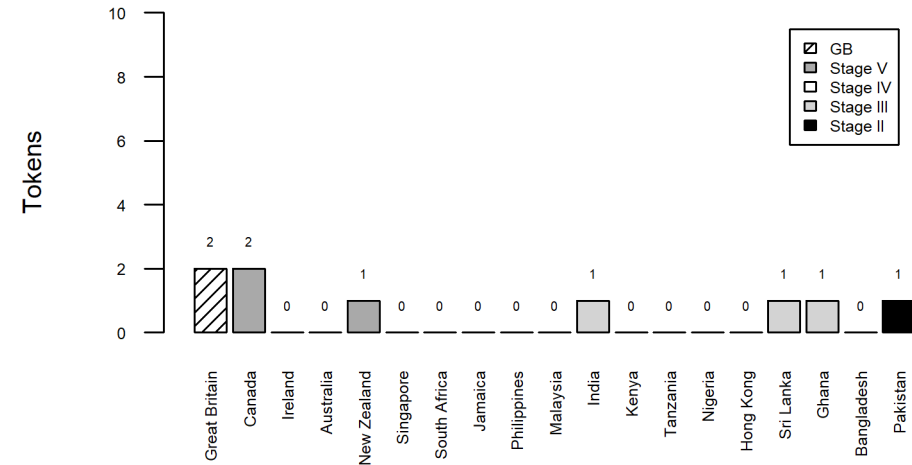


Figure 4.8 Total number of THAT-COMPLEMENTIZER C2 tokens by GloWbE variety

Table 4.14 THAT-COMPLEMENTIZER C2 tokens by GloWbE variety, grouped according to DM stage

THAT-COMP. C2	Stage V					Stage IV			Stage III								Stage II		
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
TRUE	2	2	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	1
FALSE	1549	570	391	630	359	160	202	117	176	157	313	138	99	160	154	109	111	138	173
Total	1551	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174

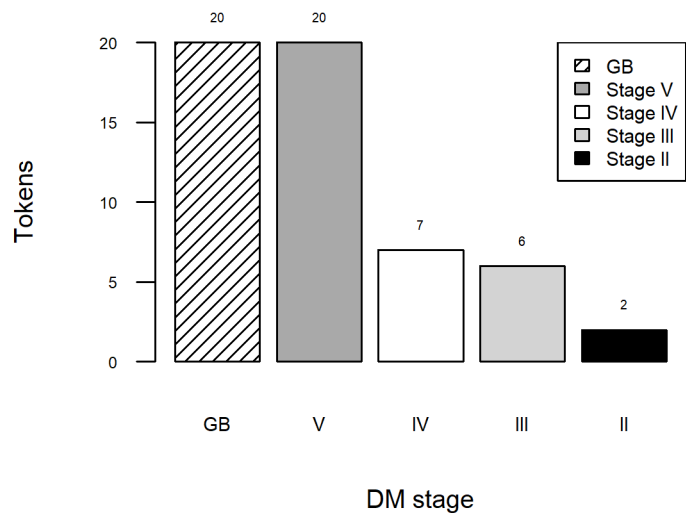


Figure 4.10 THAT-COMPLEMENTIZER in C1 by DM stage, GloWbE

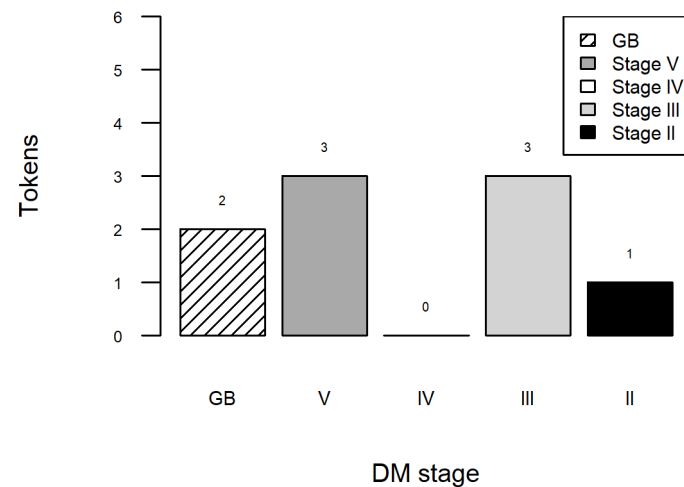


Figure 4.9 THAT-COMPLEMENTIZER in C2 by DM stage, GloWbE

Table 4.15 THAT-COMPLEMENTIZER C1 and C2 tokens by DM stage, GloWbE

	C1 THAT					C2 THAT				
	BrE	V	IV	III	II	BrE	V	IV	III	II
TRUE	20	20	7	6	2	2	3	0	3	1
FALSE	1531	1933	472	1414	310	1549	1950	479	1417	311
Total	1551	1953	479	1420	312	1551	1953	479	1420	312

4.1.2 Subject-auxiliary inversion (SAI)

Alongside *that*-complementizers, various introspective studies have used optional subject-auxiliary inversion (SAI) in C2 to argue in favor of a hypotactic analysis of English CCs, in this case as evidence for the main clause status of C2 (see section 3.1.2). Again, however, the frequencies and a statistical analyses of the corpus data in this section will show that SAI is a marginal phenomenon, with low frequencies in the corpus data. Again, this means that claims about hypotaxis in English CCs are hardly tenable. Unlike *that*-complementizers, SAI has been claimed to be possible in C2 only, which is reflected by the corpus frequencies: While instances of SAI in C2 were found in all corpora (4.10-4.12), there were none in C1 clauses.

(4.10) *The basic assumption made by Hailemariam is that [the more painting an object has,]_{C1}
[the greater **will be its value and sale price.**]_{C2}*

(COCA wlp_academic_rpe/wlp_acad_2009 ##4070610 Line: 94)

(4.11) *It is a total fallacy to think that [the more information an organisation has]_{C1}
[the better **will be the decisions.**]_{C2}*

(BNC W_commerce AM7)

(4.12) *[The more sleek and intuitive the design,]_{C1} [the more **are the users drawn to it.**]_{C2}*
(GLOWBE-IN wlp_in_ksi/wlp_in_g01 ##811922 Line: 2)

Table 4.16 shows how the corpus data was coded regarding SAI. C1 was excluded from coding because SAI is restricted to C2 (see above and section 3.1.2). NA was coded where no auxiliary verb was present, e.g. in cases of truncation and BE-deletion, or where only a full verb was present:

Table 4.16 Coding of the variable SUBJECT-AUXILIARY INVERSION C2

Factor	Levels
SUBJECT-AUXILIARY INVERSION C2	TRUE, FALSE, NA

The following sections will present the results from the COCA (4.1.2.1), BNC (4.1.2.2), and GloWbE (4.1.2.3) data sets. Tokens coded NA were excluded from the analysis unless stated otherwise.

4.1.2.1 SAI in COCA

Table 4.17 and Figure 4.11 show that in the COCA sample, SAI appears with a low frequency: Only 12 tokens out of a total of 353 relevant tokens, which amounts to just 3.40%. A simple Chi-squared test proves that the dispreference of SAI is statistically significant ($\chi^2 = 306.63$, $df=1$, $p<0.001$). As discussed in section 3.1.2, Hoffmann previously tested the competition between BE-deletion phenomena and SAI (2019: 126-27) in the COCA data set that is also used for the present study. Table 4.18⁷ and Figure 4.12, showing the raw frequency of SAI in C2 clauses, already indicate that SAI is “the least preferred option” for both auxiliary and main verb BE uses (Hoffmann 2019: 126). The bigger picture is thus clear: In both cases, whether BE functions as main verb or as an auxiliary, SAI plays a minor role,

⁷ Note that the total number given for inversion in this tables does not correspond to the total number provided for SAI in Table 4.18. This is because the latter figure includes cases of SAI without BE, e.g. *the longer they'd abjured the divorce-courts, the stronger **had grown the ties that bound them together*** (BNC W_fict_prose HWM).

making up just under (main verb) or over (auxiliary) 2% of the total tokens. Rather, as Hoffmann notes, “non-inversion as well as deletion are [...] far more likely options” employed by speakers (2019: 126). When BE is a main verb, almost two thirds (59.16%) of tokens were without SAI, and as an auxiliary, this percentage is even higher, reaching a ratio of almost 9 out of 10 (89.36%).

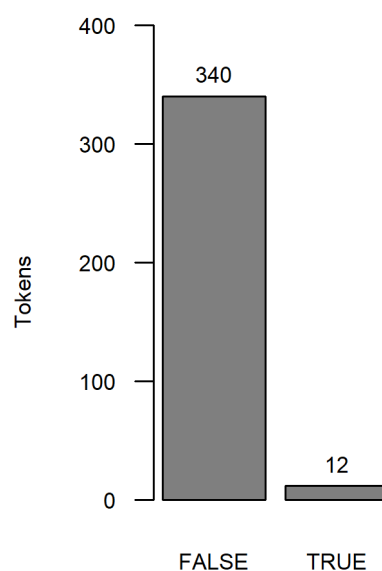


Figure 4.11 SAI in C2, COCA

Table 4.17 SAI in C2, COCA

SAI in C2	Tokens
TRUE	12
FALSE	341
Total	353

Hoffmann confirmed this with a covarying-collexeme analysis (2019: 127), whose results are reproduced in Table 4.19. The covarying-collexeme analysis reveals that “main verb BEs are much more likely to be deleted, while auxiliary BEs strongly prefer to be realized in non-inverted position” (2019: 126-27). This is evident from the fact that main verbs are statistically significantly attracted to deletion (5.199***), while for auxiliaries the same holds true with non-inversion (4.909***). As was done with *that*-complementizers, the distribution of SAI across COCA registers was examined. Table 4.20 and Figure 4.13 show raw frequencies and percentages. As the frequencies imply, SAI differs from C1 *that*-complementizers regarding registers: There are no cases of SAI in the spoken register. This is confirmed by the results of a covarying-collexeme analysis, which are presented in Table 4.21. There are no significant effects, except for a repulsion of *no* SAI in C2 in academic texts. This suggests that unlike *that*-complementizers, SAI can be seen as a feature that is more typical of the written mode, in particular, academic texts.

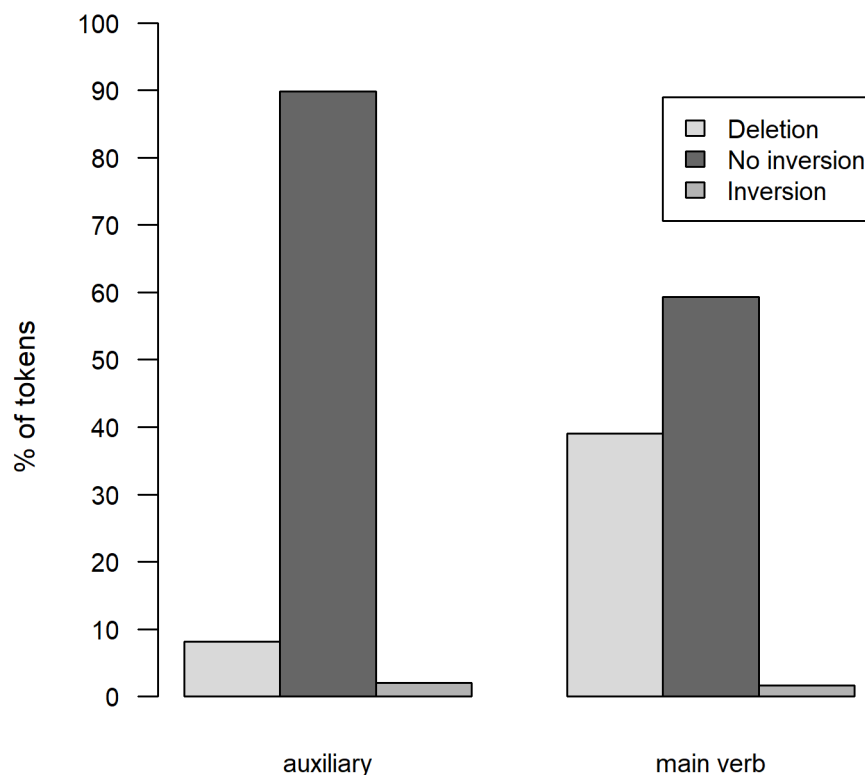


Figure 4.12 Realization of BE in C2, COCA, based on Hoffmann (2019: 127)

Table 4.18 Realization of BE in C2, COCA

Realization	Auxiliary	Main verb
Deletion	4	194
No inversion	42	294
Inversion	1	9
Total	47	497

Table 4.19 Covarying-collexeme analysis of BE-Realization in C2, COCA, from Hoffmann (2019: 127)

VERB TYPE	REALIZATION	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
Main verb	Deletion	497	198	194	180.89	attraction	5.199	***
Auxiliary	No inversion	47	336	42	29.03	attraction	4.909	***
Auxiliary	Inversion	47	10	1	0.86	attraction	0.223	n.s.
Auxiliary	Deletion	47	198	4	17.11	repulsion	5.199	***
Main verb	No inversion	497	336	294	306.97	repulsion	4.909	***
Main verb	Inversion	497	10	9	9.14	repulsion	0.223	n.s.

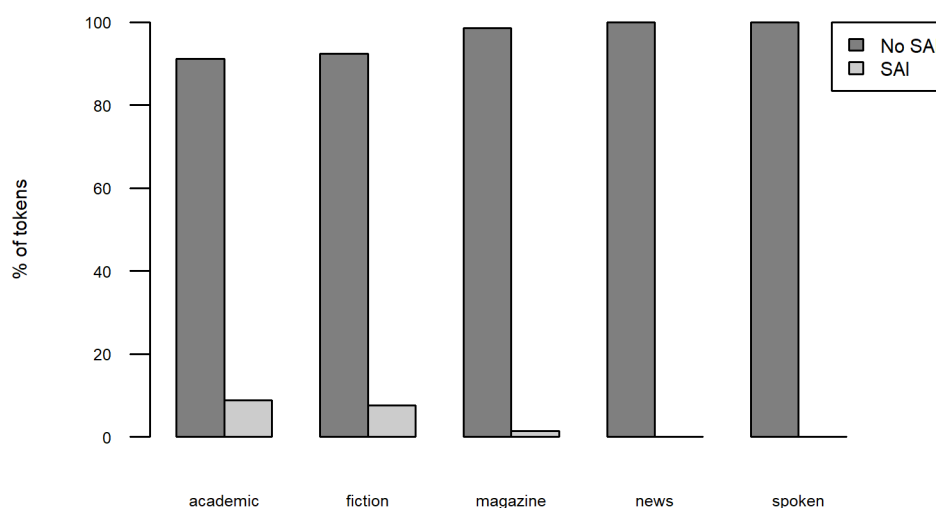


Figure 4.13 SAI in C2 by COCA register

Table 4.20 Distribution of SAI in C2 across COCA registers

SAI C2	Academic	Fiction	Magazine	News	Spoken
FALSE	72	36	141	43	48
TRUE	7	3	2	0	0
Total	79	39	143	43	48

Table 4.21 Covarying-collexeme analysis of SAI in C2 across COCA registers (expected frequency ≥ 5)

SAI C2	COCA REG.	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	magazine	340	143	141	138.12	attraction	1.130	n.s.
FALSE	spoken	340	48	48	46.36	attraction	0.777	n.s.
FALSE	news	340	43	43	41.53	attraction	0.691	n.s.
FALSE	academic	340	79	72	76.31	repulsion	2.173	**
FALSE	fiction	340	39	36	37.67	repulsion	0.864	n.s.

4.1.2.2 SAI in BNC

As Table 4.22 and Figure 4.14 show, in the BNC data there are 50 tokens with SAI (9.26%). This is a considerably higher percentage than in COCA (3.40%), suggesting that in BrE, this feature is more deeply entrenched. However, overall it is still clearly dispreferred, as a Chi-squared test shows ($\chi^2 = 385.52$, $df=1$, $p<0.001$). As was the case with the COCA data, a comparison of tokens containing an overt BE with BE-deletion tokens, provided in Table 4.23 and illustrated by Figure 4.15, reveals that SAI plays but a minor role in the BNC data, with only 3.33% of auxiliary BEs and 4.33% of main verb BEs featuring SAI. Furthermore, the BNC data presents a similar picture as the COCA, with BE-auxiliaries being

overwhelmingly non-inverted (96.67%; COCA: 89.36%), and more balance between non-inversion (51.44%; COCA: 49.15%) and deletion (44.33%; COCA: 39.03%) regarding main verb BEs.

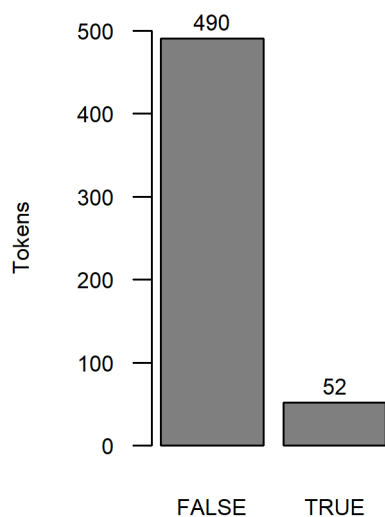


Figure 4.14 SAI in C2, BNC

Table 4.22 SAI in C2, BNC

SAI in C2	Tokens
TRUE	52
FALSE	490
Total	542

A covarying-collexeme analysis of the data, whose results are provided in Table 4.24, also confirms the patterns found in the COCA data: SAI is not only the least frequent option, but main verb BEs are more likely to be realized as deleted than auxiliary BEs, with a collostructional strength of 28.04***, while auxiliary BEs are more likely to be realized uninverted, with a collostructional strength of 25.27***. As was the case with COCA, there are no statistically significant effects for main verb BEs nor auxiliary BEs with SAI. Finally, the distribution of SAI in C2 across BNC modes was explored. Table 4.25 and Figure 4.16 show the distribution of tokens across the BNC written/spoken modes. As with COCA, it appears that SAI is more common in the written mode, however, as Table 4.26 shows, a covarying-collexeme analysis yields no significant effects.

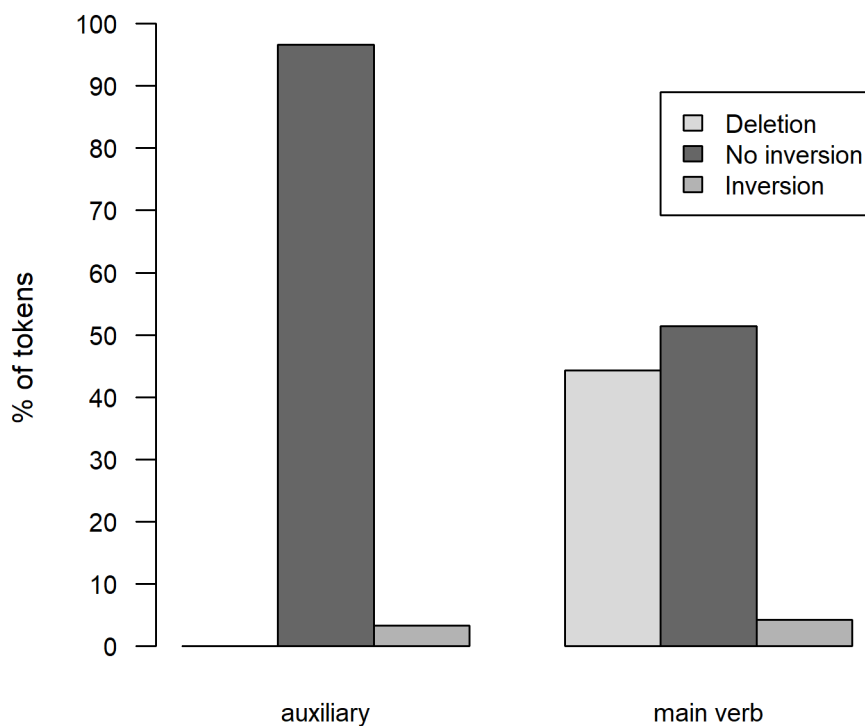


Figure 4.15 Realization of BE in C2, BNC

Table 4.23 Realization of BE in C2, BNC

Realization	Auxiliary	Main verb
Deletion	0	399
No inversion	116	463
Inversion	4	38
Total	120	900

Table 4.24 Covarying-collexeme analysis of BE-Realization in C2, BNC

VERB TYPE	REALIZATION	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
Main verb	Deletion	900	399	399	352.06	attraction	28.043	***
Auxiliary	No inversion	120	579	116	68.12	attraction	25.266	***
Main verb	Inversion	900	42	38	37.06	attraction	0.359	n.s.
Auxiliary	Deletion	120	399	0	46.94	repulsion	28.043	***
Main verb	No inversion	900	579	463	510.88	repulsion	25.266	***
Auxiliary	Inversion	120	42	4	4.94	repulsion	0.359	n.s.

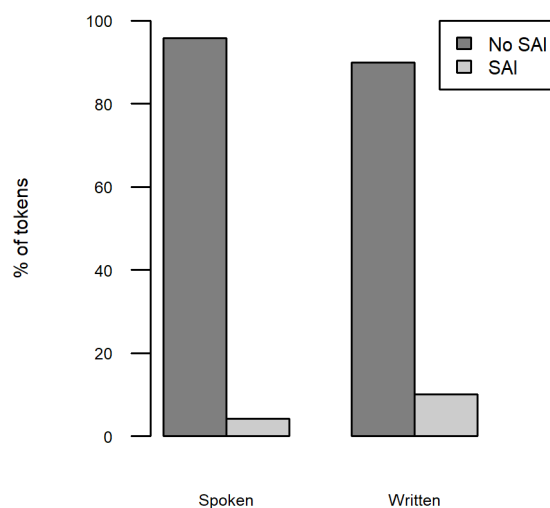


Figure 4.16 SAI in C2 by BNC mode

Table 4.25 SAI in C2 by BNC mode

SAI C2	Spoken	Written
FALSE	45	445
TRUE	2	50
Total	47	495

Table 4.26 Covarying-collexeme analysis of SAI in C2 across BNC modes (expected frequency ≥ 5)

THAT-c. C1	COCA REG.	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	Spoken	490	47	45	42.49	attraction	0.834	n.s.
TRUE	Written	52	495	50	47.49	attraction	0.834	n.s.
FALSE	Written	490	495	445	447.51	repulsion	0.834	n.s.
TRUE	Spoken	52	47	2	4.51	repulsion	0.834	n.s.

4.1.2.3 SAI in GloWbE

Table 4.27 and Figure 4.17 show that out of the three corpora, GloWbE has the lowest proportion of SAI (39/1,712 tokens = 2.27%). The overwhelming majority of tokens (1,673/1,712 tokens = 97.73%) did not exhibit SAI. This reflects SAI in COCA and BNC, with a dispreference that is statistically significant, as a Chi-squared test shows ($\chi^2 = 1559.6$, $df=1$, $p<0.001$). Table 4.29 and Figure 4.20 reveal that again, there appears to be a higher preference for deletion when BE is a main verb (715/1974 = 36.22%) compared to when it is in auxiliary function (17/322 = 5.27%). More importantly, when in competition with deletion and non-inversion, SAI clearly loses out, reflecting the COCA and BNC data sets: Only 25 tokens (1.27%) of main verb BEs and three tokens of auxiliary BEs (0.93%) were inverted in the GloWbE data. This suggests that across all GloWbE varieties, SAI is a marginal

phenomenon, confirming Hoffmann’s ICE study, in which SAI tokens made up no more than 15 out of 239 tokens (6.27%) across all varieties (2019: 214).

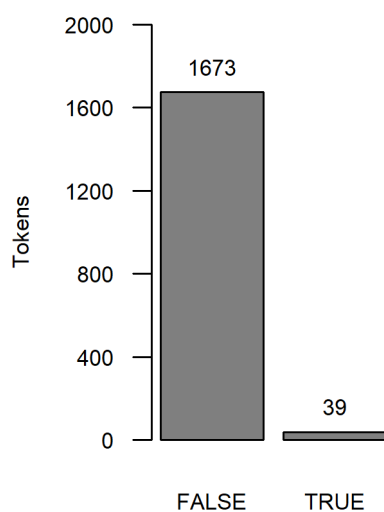


Figure 4.17 SAI in C2, GloWbE

Table 4.27 SAI in C2, GloWbE

SAI in C2	Tokens
TRUE	39
FALSE	1673
Total	1712

This tendency is also evident from Table 4.28 and Figures 4.18 and 4.19, which show in detail that SAI is indeed highly dispreferred across all GloWbE varieties, making up only a fraction of tokens in each variety. In fact, despite the large scale of the present corpus study – recall that the GloWbE data set consists of 5,715 C1C2 tokens, roughly a 16-fold increase over Hoffmann’s ICE study that was based on 352 tokens (Hoffmann 2019: 206) – in some corpus components there were no SAI tokens at all, including stage V (NZE) and stage III (PhilE, MalE and GhE). Also, it appears that the overall lower percentage of C2 SAI tokens in the GloWbE data (2.27%, compared to 3.40% in COCA and 9.26% in BNC) is not due to a stronger dispreference of this hypotactic feature in stage III and IV varieties. In fact, even just within the 1,000 BrE and stage V variety tokens, there are no more than 18 instances of SAI (1.8%).

Table 4.30 and Figure 4.21, which show the amount of SAI tokens in each DM stage, thus present a more balanced picture compared to *that*-complementizers: SAI does not appear to be significantly preferred in BrE and stage V varieties. However, the proportion of SAI appears to be higher in specific varieties across all DM stages. From the stage V varieties, AuE stands out, with a ratio of 8/178 tokens = 4.49% SAI tokens; of the stage IV varieties SingE has a relatively high ratio of 4/60 tokens = 6.67%, and of the stage III varieties, IndE reaches a similar ratio, with 7/106 tokens = 6.60%. However, none of these exceed the ten percent mark.

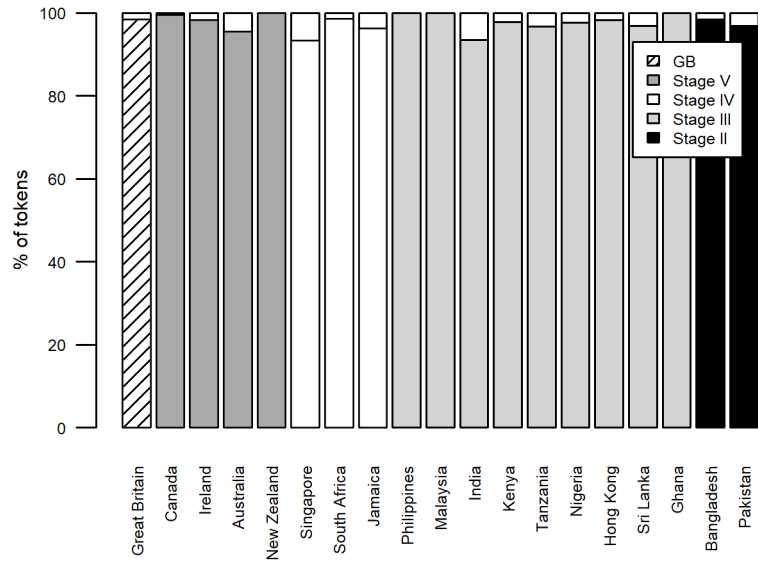


Figure 4.19 Percentage of SAI in C2 tokens by GloWbE variety

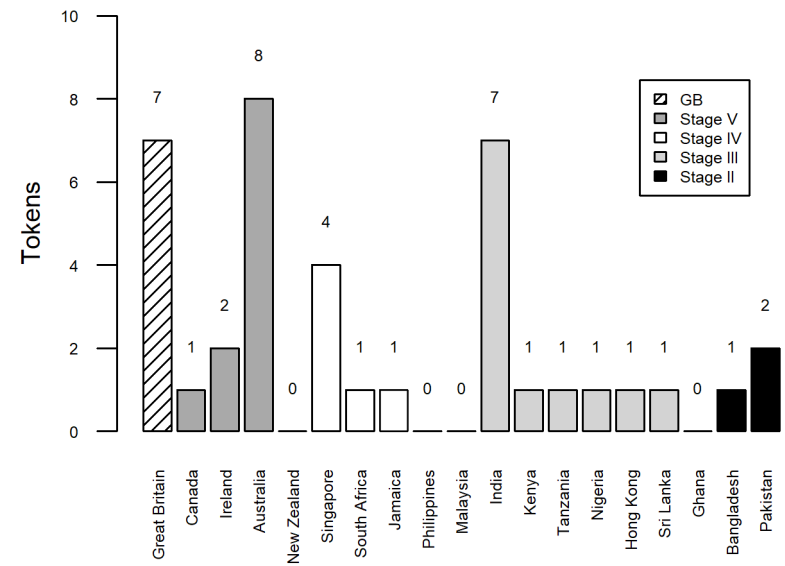


Figure 4.18 Total number of SAI in C2 tokens by GloWbE variety

Table 4.28 SAI in C2 tokens by GloWbE variety, grouped according to DM stage

SAI C2	Stage V					Stage IV			Stage III								Stage II		
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
TRUE	7	1	2	8	0	4	1	1	0	0	7	1	1	1	1	1	0	1	2
FALSE	430	176	110	170	96	56	65	25	63	39	99	44	29	40	53	30	29	59	60
Total	437	177	112	178	96	60	66	26	63	39	106	45	30	41	54	31	29	60	62

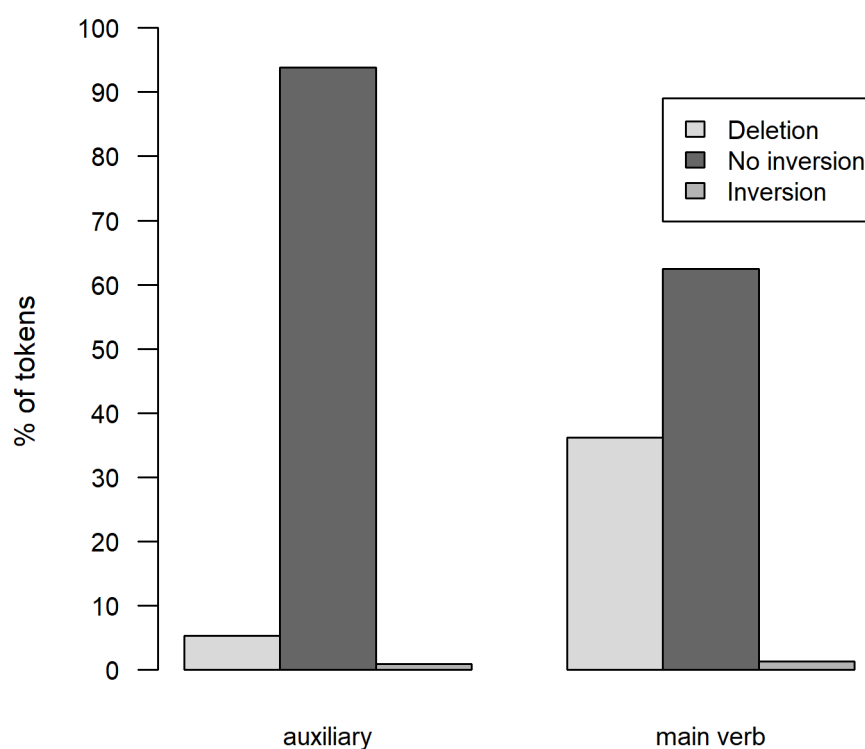


Figure 4.20 Realization of BE in C2, GLOWBE

Table 4.29 Realization of BE in C2, GloWbE

Realization	Auxiliary	Main verb
Deletion	17	715
No inversion	302	1234
Inversion	3	25
Total	322	1974

To test whether SAI is indeed independent of DM stages, a covarying-collexeme analysis was carried out whose results are presented in Table 4.31. They confirm that there are no statistically significant associations between any DM stage and SAI. At most, it is warranted to speak of a slight attraction of stage V varieties to non-inversion (collostructional strength of 1.094) and stage IV varieties to SAI (with a collostructional strength of 0.901). However, both of these values are clearly below the significance threshold of 1.31 ($p \geq 0.05$).

Returning to the competition between SAI and other types of realization of BE, Tables 4.32 and 4.33, and Figures 4.22 and 4.23 suggest that there are no significant differences across the five DM stages in this respect. Each stage shows a strong dispreference for SAI, regarding both main verb BEs, as well as auxiliary BEs. This reflects the general patterns that were determined in the COCA and BNC studies. Table 4.34 shows the results table of a HCFA, with three types emerging, i.e., statistically significant configurations that occurred more often than could be expected by chance. Thus, there is evidence for the existence of the

following subschemas: auxiliary-no inversion in stage V ($p < 0.005 \cong **$), auxiliary-no inversion in stage IV ($p < 0.024 \cong *$), and auxiliary-no inversion in stage III ($p < 0.028 \cong *$).

This, along with the fact that there were no statistically significant effects for any configuration with inversion, suggests that SAI is of minimal importance across all GloWbE varieties. We can therefore conclude that the results from all corpora – COCA, BNC, and GloWbE – show that, in the words of Hoffmann, “[subject-auxiliary inversion] can [...] be said to hardly play a role in PdE” (2019: 127). This applies to stage V varieties just as much as to stage IV and III varieties, and it is also true for SAI in comparison with BE-deletion and non-inversion.

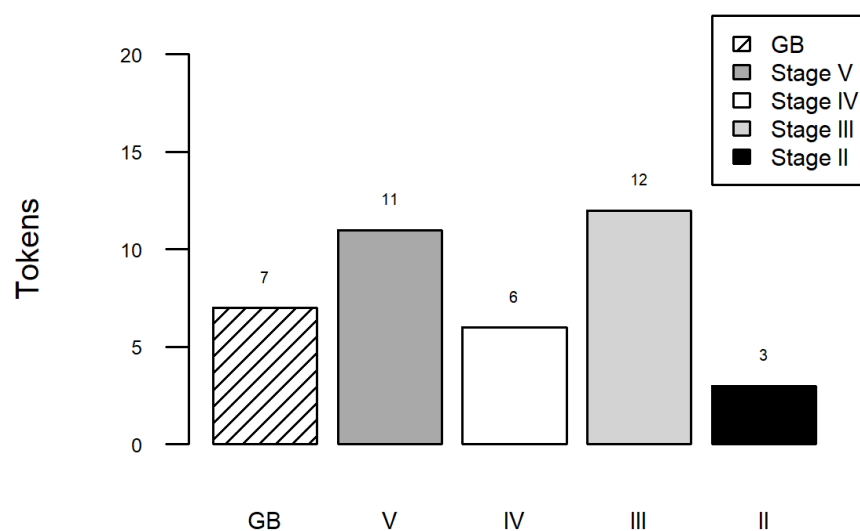


Figure 4.21 SAI in C2 tokens by DM stage, GloWbE

Table 4.30 SAI in C2 tokens by DM stage, GloWbE

SAI in C2	BrE	V	IV	III	II
TRUE	7	11	6	12	3
FALSE	430	552	146	426	119
Total	437	563	152	438	122

Table 4.31 Covarying-collexeme analysis of SAI in C2, GloWbE

SAI C2	DM Stage	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
FALSE	V	1673	1000	982	977.22	attraction	1.094	n.s.
TRUE	IV	39	152	6	3.46	attraction	0.901	n.s.
TRUE	III	39	438	12	9.98	attraction	0.554	n.s.
TRUE	II	39	122	3	2.78	attraction	0.272	n.s.
TRUE	V	39	1000	18	22.78	repulsion	1.094	n.s.
FALSE	IV	1673	152	146	148.54	repulsion	0.901	n.s.
FALSE	III	1673	438	426	428.02	repulsion	0.554	n.s.
FALSE	II	1673	122	119	119.22	repulsion	0.272	n.s.

Table 4.32 Realization of main verb BE in C2 by DM stage, GloWbE

Realization	BrE	V	IV	III	II
Deletion	184	239	64	192	36
No inversion	329	455	78	305	67
Inversion	5	7	5	6	2
Total	518	701	147	503	105

Table 4.33 Realization of auxiliary BE in C2 by DM stage, GloWbE

Realization	BrE	V	IV	III	II
Deletion	3	6	1	6	1
No inversion	81	92	31	79	19
Inversion	0	1	0	2	0
Total	84	99	32	87	20

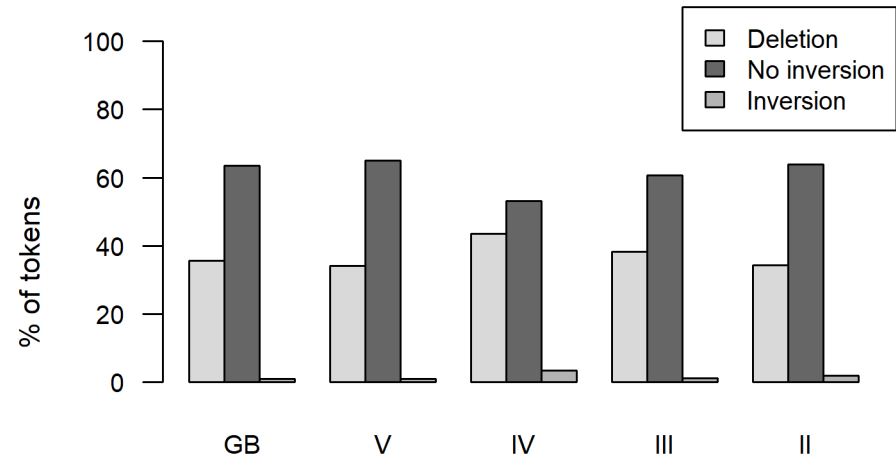


Figure 4.22 Realization of main verb BE in C2 by DM stage, GloWbE

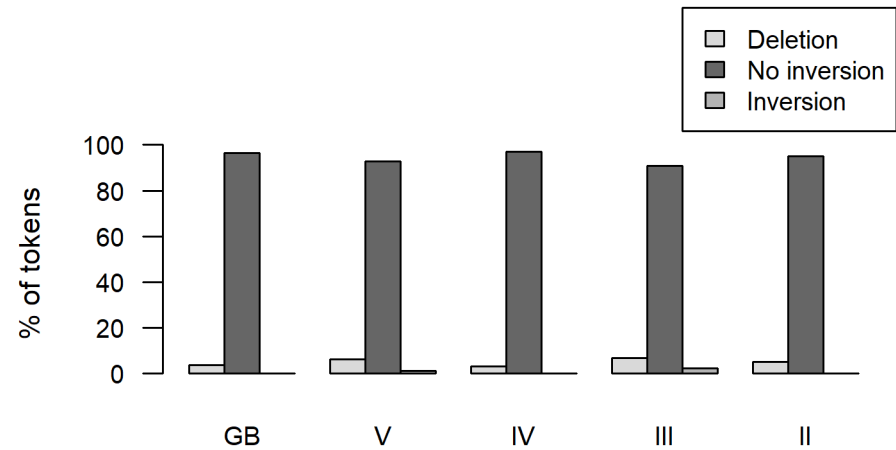


Figure 4.23 Realization of auxiliary BE in C2 by DM stage, GloWbE

Table 4.34 HCFA of BE realization in C2, GloWbE (observed frequency ≥ 5 , $Q \geq 0.002$)

DM stage	BE type	Realization	Freq.	Exp.	Cont. chisq.	Obs-exp	p-value	DEC.	Q
V	AUX	Deletion	9	62.69	45.978	<	<0.001	***	0.024
V	MV	Deletion	423	384.29	3.899	>	0.275	ns	0.020
V	AUX	No Inversion	173	131.54	13.069	>	0.005	**	0.019
III	MV	No Inversion	305	339.35	3.477	<	0.310	ns	0.018
V	MV	No Inversion	784	806.39	0.621	<	1.694	ns	0.015
III	MV	Deletion	192	161.72	5.669	>	0.149	ns	0.014
III	AUX	No Inversion	79	55.35	10.100	>	0.028	*	0.011
IV	MV	No Inversion	78	102.96	6.049	<	0.096	ms	0.011
III	AUX	Deletion	6	26.38	15.745	<	<0.001	***	0.009
IV	MV	Deletion	64	49.06	4.546	>	0.329	ns	0.007
IV	AUX	No Inversion	31	16.79	12.017	>	0.024	*	0.006
IV	AUX	Deletion	1	8	6.128	<	0.057	ms	0.003
II	AUX	No Inversion	19	11.73	4.510	>	0.367	ns	0.003
II	AUX	Deletion	1	5.59	3.768	<	0.319	ns	0.002
II	MV	No Inversion	67	71.9	0.333	<	2.128	ns	0.002

4.2 Clause order

As discussed in section 3.2, English CCs feature clause order phenomena that challenge reductionist analyses (e.g. Borsley 2004; den Dikken 2005; Abeillé et al. 2006) and simple templates such as the one posited by Culicover and Jackendoff (1999: 567). The following sections will take a closer look at the non-iconic C2C1 order (section 4.2.1) and ‘stacked’ C1C23... clauses (section 4.2.2) to see what role they play in the corpus data. As will be shown, both of these phenomena are common in all corpora and across all varieties, with higher frequencies than *that*-complementizers and SAI. To investigate clause order phenomena, the COCA, BNC, and GloWbE data sets were coded as show in Table 4.35.

Table 4.35 Coding of the variable ORDER

Factor	Levels
ORDER	C1C2, C2C1, C1C2C3..., C3C2C1... (and variations thereof)

4.2.1 Non-iconic C2C1 order

In some CCs, the C2 apodosis precedes the C1 protasis, a structure that has been referred to as CC’ construction (Culicover and Jackendoff 1999: 549). As was discussed in section 3.2.1, all corpus studies that have been conducted so far have shown a general tendency across languages to prefer the C1C2 order, which can be attributed to cognitive constraints (iconicity). However, the C2C1 order is not uncommon in English, as will be shown in the following. In all three corpora, there were instances of CC’ constructions (4.13-4.15):

- (4.13) [*Ophelia grew paler*]_{C2} [*the closer the judges came.*]_{C1}
(COCA wlp_fiction_awq/wlp_fic_2011 ##4121857 Line: 143)
- (4.14) [*The chances of getting this pain are greater*]_{C2} [*the older you are.*]_{C1}
(BNC W_misc A0J)
- (4.15) [*A piece of food will pick up more bacteria*]_{C2} [*the longer it spends on the floor.*]_{C1}
(GLOWBE-LK wlp_lk_ssy/wlp_lk_b01 ##3861533 Line: 16)

The following sections will show that the frequency of non-iconic C2C1 structures in each data set is generally higher than the proportion of *that*-complementizers and SAI. With the objectives of the study in mind, the proportion of C1C2 vs. C2C1 in the COCA and BNC data sets will be presented, confirming the predictions made earlier – that is, there is a clear preference for the C1C2 order due to iconicity (see section 3.2.1). This will not be possible with the GloWbE data, because it is not comparable to the BNC and COCA data – as discussed in section 2.3.1.3, the GloWbE C1C2 data set is a stratified random sample, whereas the C2C1 data set includes *all* cases of CC' constructions that could be retrieved from the corpus. Instead, it was decided to resort to calculating the proportion of C2C1 tokens vs. C1C2 tokens in each GloWbE variety, which will at least permit a comparison between the different GloWbE varieties, and allow determining possible variety-specific and DM stage-specific patterns. Furthermore, LNRE modeling will be used to test Hoffmann's hypothesis that "the iconic C1C2 CC construction is also much more productive than the non-iconic C2C1 CC' construction in PdE" (2019: 71).

Finally, to investigate the frequency of the clause-initial *the* in C2 clause in CC' constructions, the corpus data was also coded as shown in Table 4.36.

Table 4.36 Coding of the variable *THE IN C2*

Factor	Levels
THE IN C2	TRUE, FALSE

4.2.1.1 Non-iconic C2C1 order in COCA

The COCA data set contained 1,409 C1C2 tokens and 39 C2C1 tokens, as shown in Table 4.37 and Figure 4.24. This amounts to a ratio of 36:1 in favor of C1C2, which indicates a clear preference for the iconic order. A Chi-squared test confirms that the dispreference of C2C1 is significant ($\chi^2=1296.2$, $df=1$, $p<0.001$). Note that there are more C2C1 tokens in the data set than C1 *that*-complementizers ($n=24$) and SAI ($n=12$). Table 4.38 shows that of the 39 C2C1 tokens, only two (just under 5%) had a clause-initial *the* in C2, a dispreference that is statistically significant, as a Chi-squared test shows ($\chi^2=31.41$, $df=1$, $p<0.001$).

Finally, to compare the productivity of the lexical filler slots in the C1C2 and C2C1 data sets, an LNRE model was employed. The results are presented in Figure 4.25. In the graph, the dashed vertical line indicates the C2C1 sample size; the solid line the C1C2 sample size. The small horizontal lines along the curves indicate confidence intervals (as in all LNRE curve plots that follow). The results show that concerning the C1 slot, the iconic CC construction is clearly more productive. However, when it comes to the C2 slot, it is the non-iconic CC' construction that is more productive. In fact, there does not appear to be a big difference between the lexical filler slot productivity of C1 and C2 in the iconic CC construction, whereas there is a clear difference regarding the CC' construction.

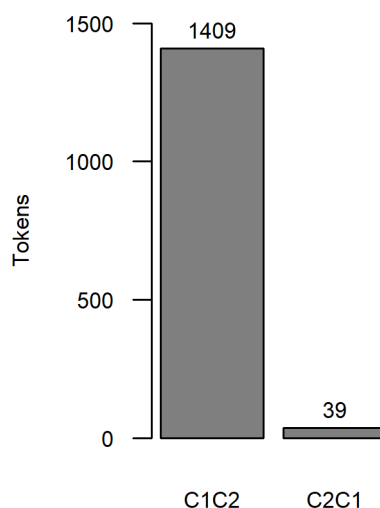


Figure 4.24 C1C2 vs C2C1 tokens, COCA

Table 4.37 C1C2 and C2C1 tokens, COCA

ORDER	Tokens
C1C2	1409
C2C1	39
Total	1448

As sections 4.2.1.2 and 4.2.1.3 will show, this is a pattern that emerged across all corpora and all GloWbE varieties. The possible reasons for this will be discussed in more detail in chapter 6. It must be pointed out, however, that these results warrant a re-evaluation of Hoffmann's hypothesis about differences in productivity between CC and CC' constructions. It will be necessary to assume a more differentiated perspective – while Hoffmann's claim about the iconic CC being more productive holds true for the C1 clause, the opposite is true for the C2 clause.

Table 4.38 THE in C2 tokens, COCA

THE in C2	Tokens
TRUE	2
FALSE	37
Total	39

To further investigate slot productivity, it was decided to also calculate an LNRE model for the combined C1 and C2 slots, that is, filler pair combinations such as *more_{C1}-more_{C2}*. Figure 4.26 shows that the C2C1 data set is slightly more productive. Again, this means that Hoffmann's claims about the more entrenched, iconic C1C2 order being more productive will have to be reassessed.

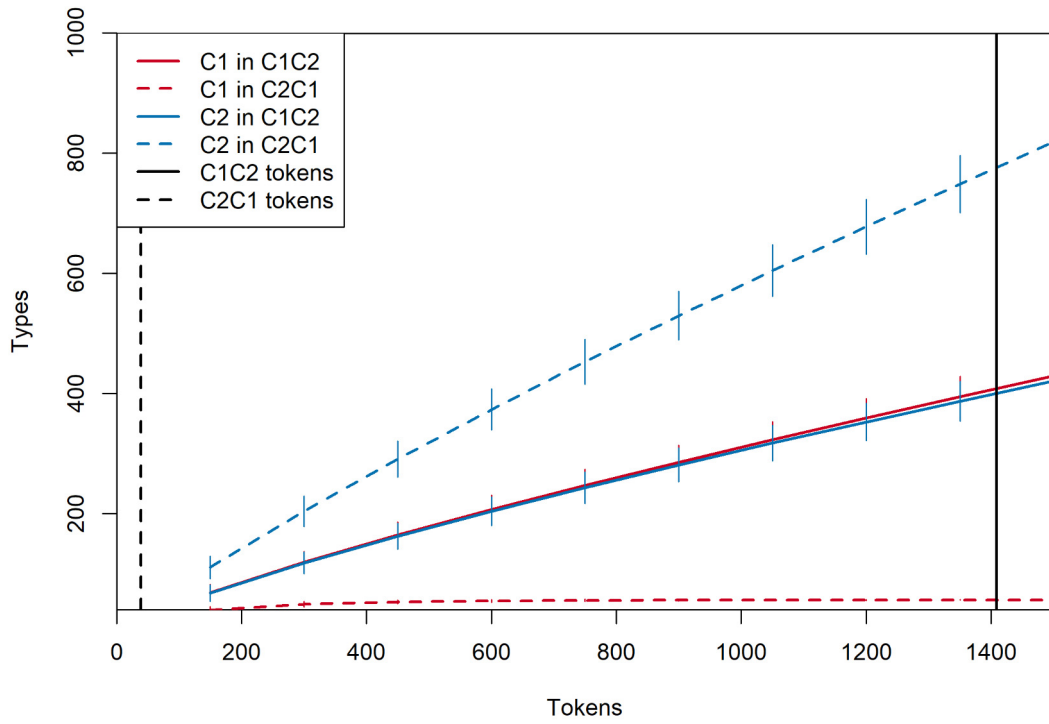


Figure 4.25 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 and C2, COCA. Vertical lines indicate sample size

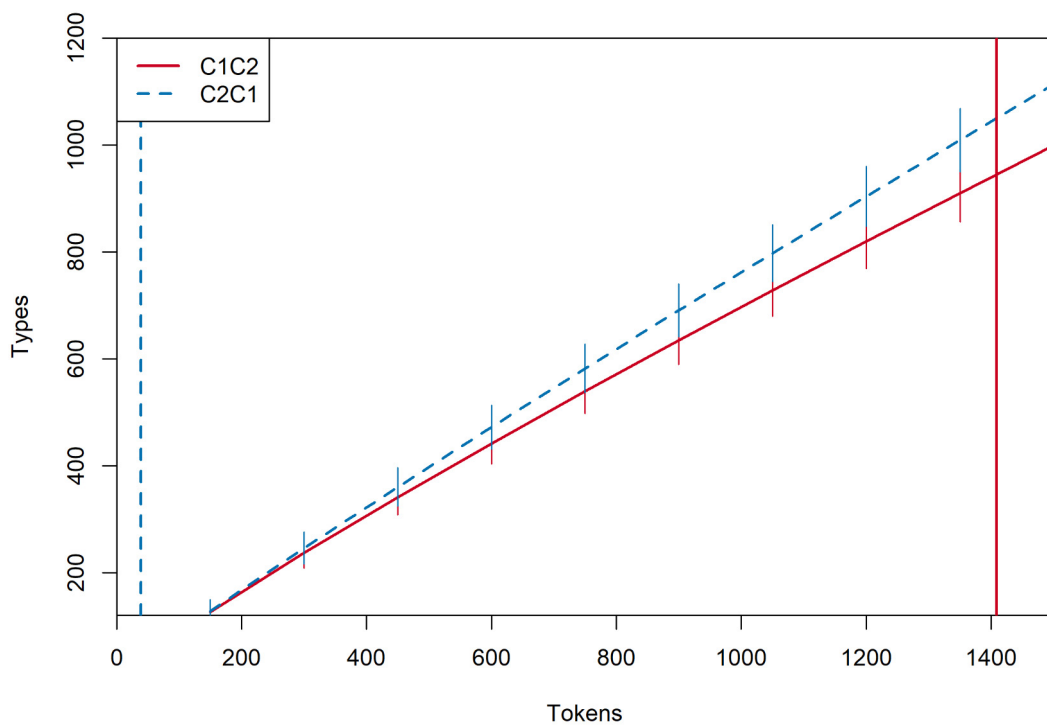


Figure 4.26 LNRE model of C1C2 and C2C1 lexical filler productivity (C1 and C2 combinations), COCA. Vertical lines indicate sample size

4.2.1.2 Non-iconic C2C1 order in BNC

A look at the BNC data (Table 4.39 and Figure 4.27), adopted from Hoffmann et al. (2020), paints a picture similar to the COCA data set. There were 2,041 C1C2 tokens compared to 139 C2C1 tokens, i.e., “a ratio of almost 15:1 ($\chi^2 = 1,659.5$, $df = 1$, $p < 0.001$)” (2020: 204). Thus, there is a statistically significant dispreference for the C2C1 order, and as was the case with COCA, this is a higher frequency than C1 *that*-complementizers ($n=29$) and SAI ($n=52$).

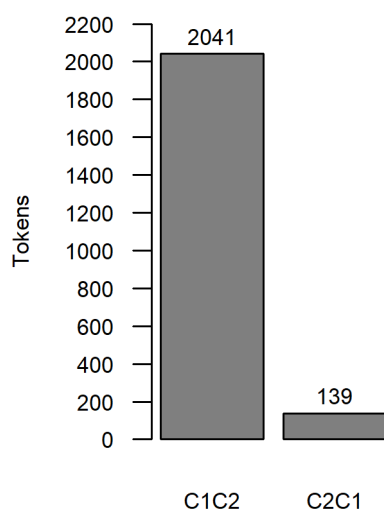


Figure 4.27 C1C2 vs C2C1 tokens, BNC

Table 4.39 C1C2 and C2C1 tokens, BNC

ORDER	Tokens
C1C2	2041
C2C1	139
Total	2180

Regarding clause-initial *the* in C2 in CC' constructions, the BNC data reflects the findings from COCA: Table 4.40 shows that of the 139 C2C1 tokens in BNC, only 11 (just under 8%) had a clause-initial *the* in C2, a dispreference that is statistically significant, as a Chi-squared test shows ($\chi^2=98.48$, $df=1$, $p<0.001$).

Table 4.40 THE in C2 tokens, BNC

THE in C2	Tokens
TRUE	11
FALSE	128
Total	139

The LNRE model in Figure 4.28 reveals a pattern similar to COCA: In the C1 slot, the iconic C1C2 order is more productive; regarding the C2 slot, the non-iconic C2C1 order is more productive, although the C2C1 curve is much more closer to the C1C2 curve. Overall,

the curve for C1 and C2 is very similar regarding the CC construction, while there is a considerable difference between C1 and C2 in the CC' construction. As with the COCA data, an LNRE model was also calculated for C1-C2 filler pairs. The results, shown in Figure 4.29, reflect the corresponding GloWbE curves, with an even more pronounced difference in productivity, such that the C2C1 data set is considerably more productive.

4.2.1.3 Non-iconic C2C1 order in GloWbE

The GloWbE C2C1 data set consists of 904 tokens. Figure 2.3 from section 2.3.1.3, replicated here as Figure 4.31, and Table 4.42 shows the distribution of C2C1 across the GloWbE varieties. Table 4.42 also includes the amount of C1C2 tokens, which were used to calculate variety- and stage- specific C1C2:C2C1 ratios, which are illustrated by Figure 4.30 (see below). As was pointed out in section 2.3.1.3, because the GloWbE C1C2 data set is based on a stratified random sample, while the C2C1 data set contains *all* such instances found in the corpus, a C1C2:C2C1 ratio cannot be calculated, at least not in the same way as for the COCA and BNC data. However, a C1C2:C2C1 ratio can be calculated for each GloWbE variety to compare the varieties to each other. These variety-specific C1C2:C2C1 ratios show that in general, the C1C2:C2C1 ratio is lower in the stage V varieties, where it is never higher than 4.00. In stage III and II varieties, the ratio is consistently higher than 4.00, reaching values of up to 12.55 (KenE), and even in the more evolved stage IV varieties, the ratio is never lower than 5.00. Table 4.41 shows the C1C2:C2C1 ratios for each DM stage, again revealing a tendency towards a higher ratio in lower stages; while the C1C2:C2C1 ratio in stage V is 3.66, this increases to almost 5 in stages IV and III, and reaches 6.12 in stage II.

This corresponds to the expectations outlined in section 3.2.1, where it was predicted that in PCEs, the iconic C1C2 order is more deeply entrenched. Furthermore, the fact that C2C1 structures were found across all varieties – including HKE, KenE, NigE, and TanzE, for which Hoffmann could not find any C2C1 structures in his ICE study (2019: 206) – shows that Hoffmann's data did not have any “accidental gap[s]” (2019: 206).

As with the COCA and BNC data, LNRE models were calculated to compare the productivity of the C1 and C2 lexical filler slots. This was done for each DM stage; the results are presented in Figures 4.32 and 4.33. Reflecting the results from COCA and BNC, they show that in each stage, C2C1 order productivity (dashed lines) differs greatly between the C1 and C2 slot.

Table 4.41 C1C2 and C2C1 tokens across DM stages

ORDER	Stage V	Stage IV	Stage III	Stage II
C1C2	1953	479	1420	312
C2C1	534	80	239	51
Total	2487	559	1659	363
C1C2:C2C1	3.66	5.99	5.94	6.12

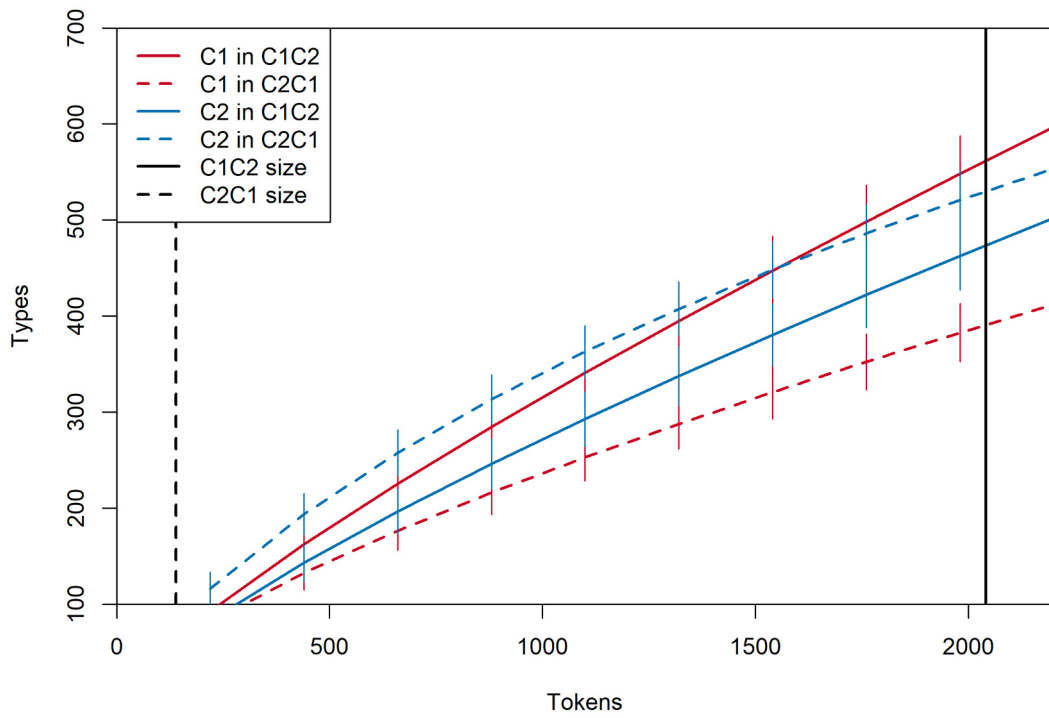


Figure 4.28 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 and C2, BNC. Vertical lines indicate sample size

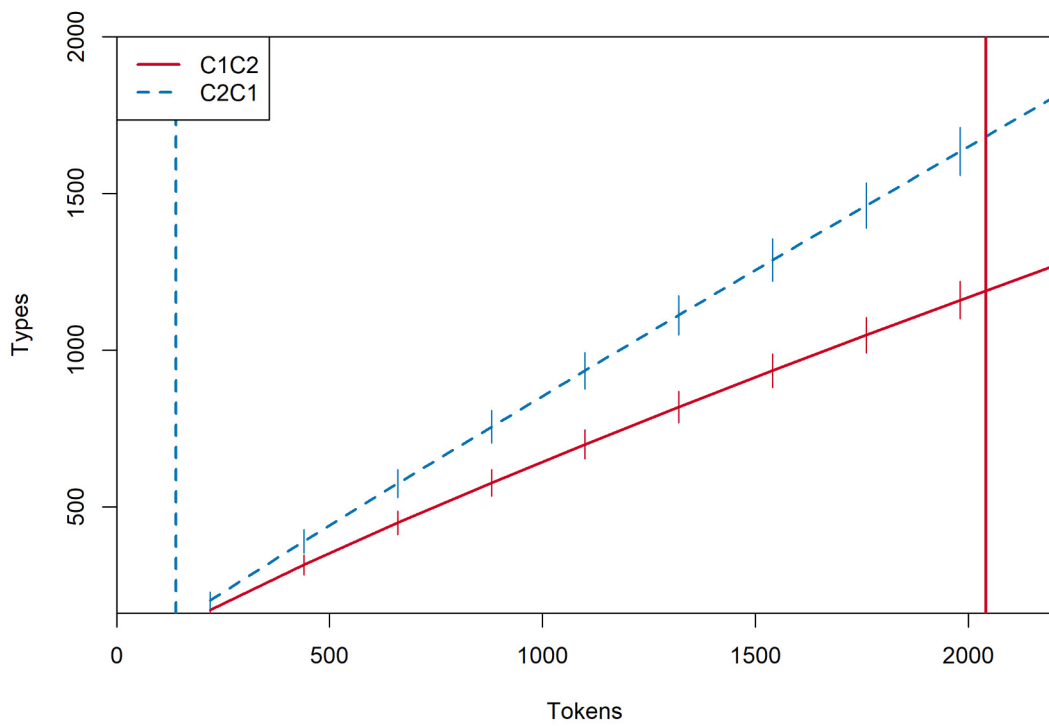


Figure 4.29 LNRE model of C1C2 and C2C1 lexical filler productivity (C1 and C2 combinations), BNC. Vertical lines indicate sample size

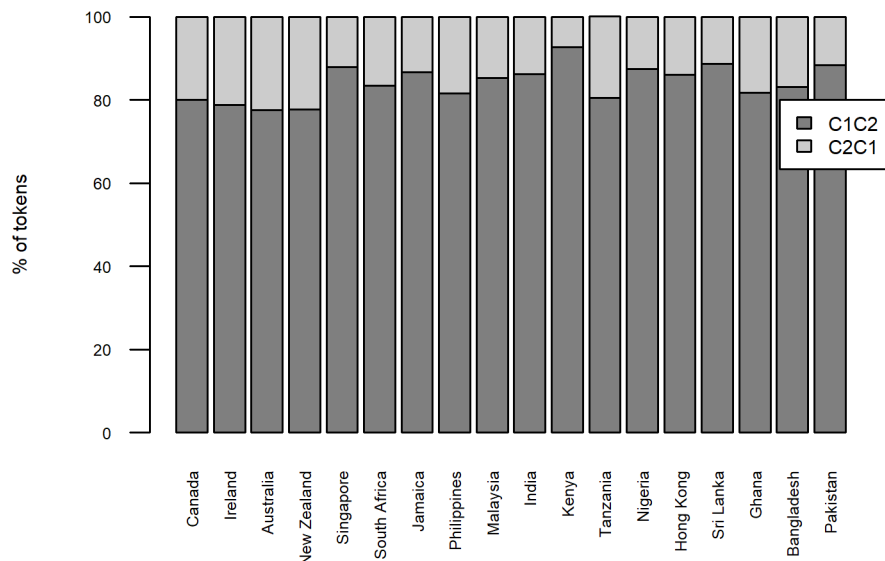


Figure 4.30 C1C2:C2C1 token ratio by GloWbE variety

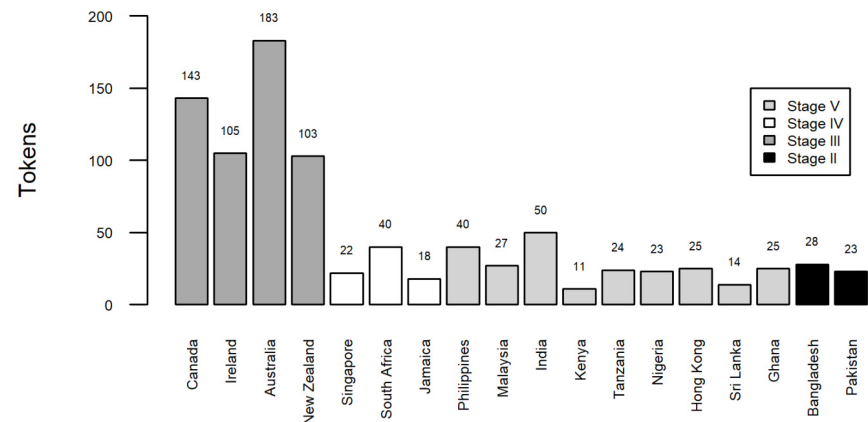


Figure 4.31 Total number of C2C1 tokens by GloWbE variety

Table 4.42 C1C2 and C2C1 tokens by GloWbE variety, grouped according to DM stage

ORDER	Stage V				Stage IV			Stage III								Stage II		
	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
C1C2	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174
C2C1	143	105	183	103	22	40	18	40	27	50	11	24	23	25	14	25	28	23
Total	715	496	813	463	182	242	135	216	184	364	149	123	183	179	124	137	166	197
C1C2:C2C1	4.00	3.72	3.44	3.50	7.27	5.05	6.50	4.40	5.81	6.28	12.55	4.13	6.96	6.16	7.86	4.48	4.93	7.57

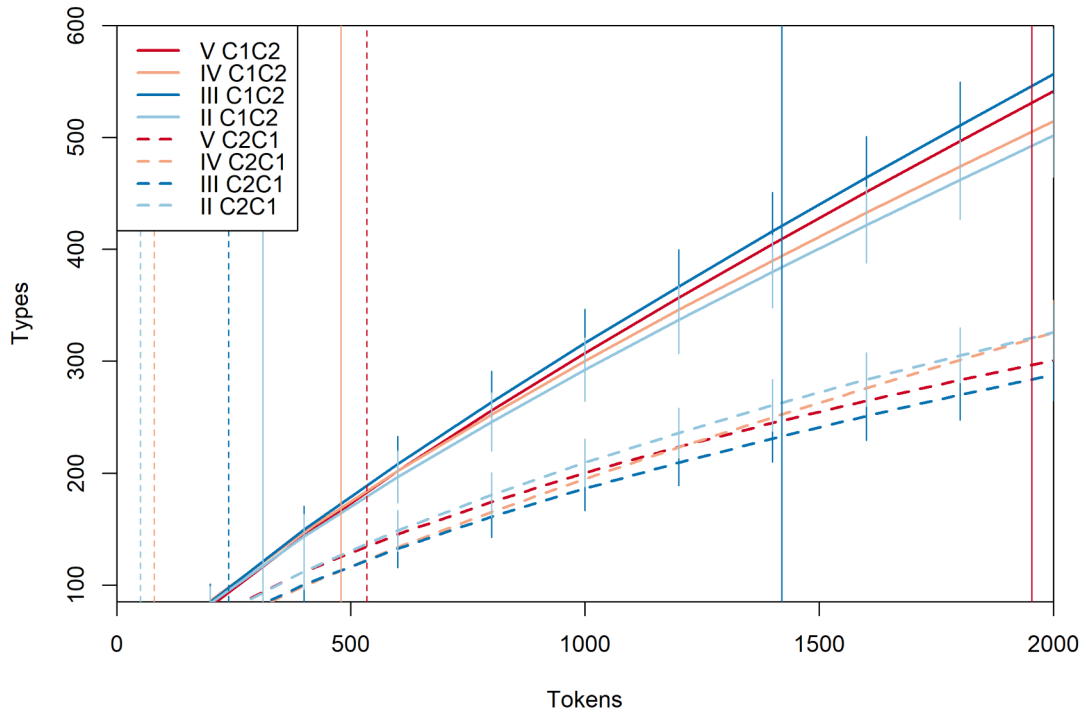


Figure 4.32 LNRE model of C1C2 and C2C1 lexical filler productivity in C1 across DM stages, GloWbE. Vertical lines indicate sample size

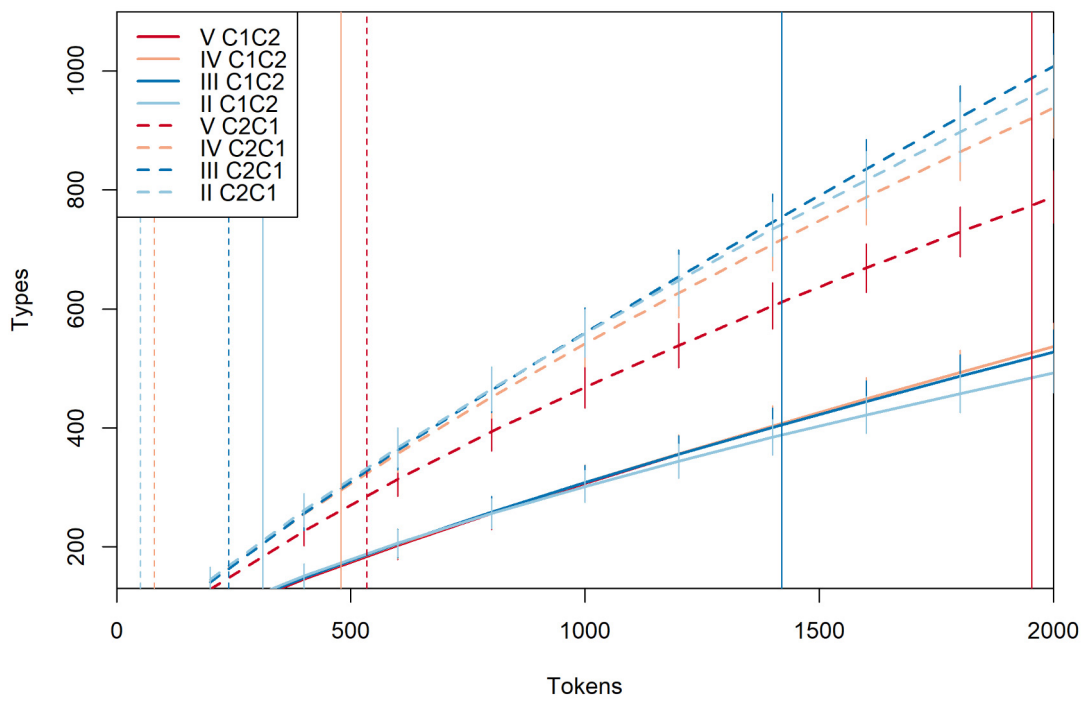


Figure 4.33 LNRE model of C1C2 and C2C1 lexical filler productivity in C2 across DM stages, GloWbE. Vertical lines indicate sample size

In every DM stage, the C1 slot is considerably less productive than the C2 slot in the C2C1 order, whereas in the C1C2 data sets, the difference between the C1 and C2 slots was much less pronounced. Thus, these results show the same pattern as in COCA and BNC, that is, more productive C1 slots and less productive C2 slots in C2C1 when compared to C1C2 structures. To further investigate this phenomenon, lexical filler combinations, e.g. *more_{C1}-more_{C2}* were also subjected to LNRE modeling, whose results are shown in Figure 4.34. The curves reveal that the C2C1 data sets are more productive in every DM stage. Again, this corresponds to the results from COCA and BNC, and means that a more differentiated look will have to be taken at Hoffmann's claims about C1C2 being more productive compared to C2C1.

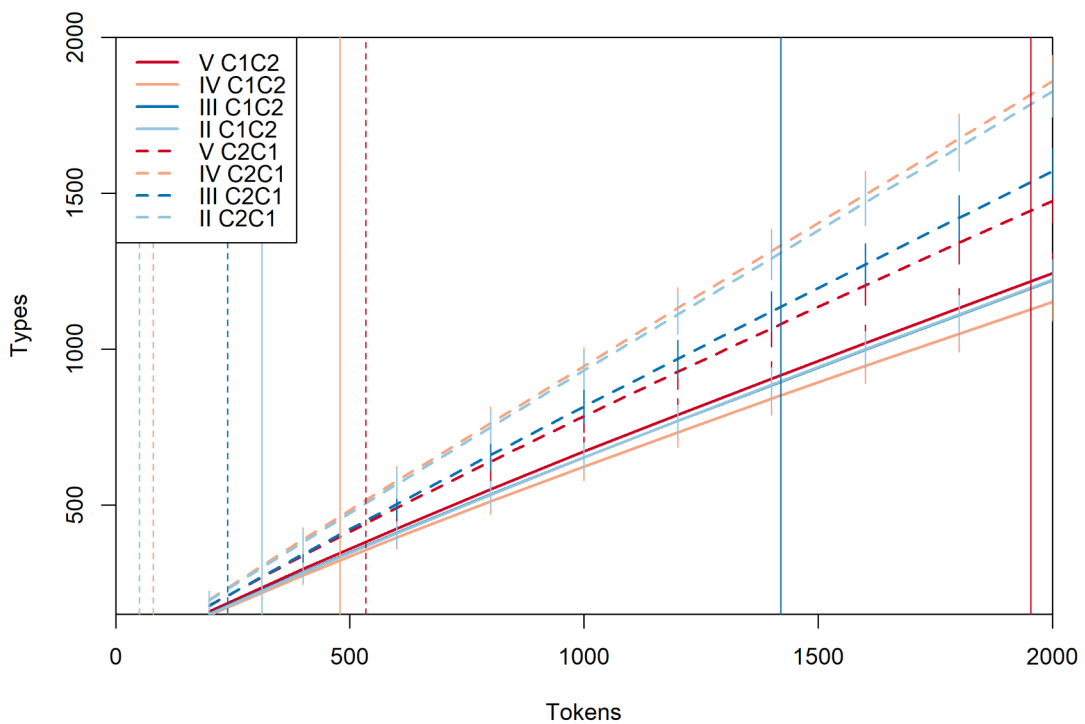


Figure 4.34 LNRE model of C1C2 and C2C1 lexical filler productivity (C1C2 combinations) across DM stages, GloWbE. Vertical lines indicate sample size

Finally, a brief note on clause-initial *the* in C2. In total, there were only 3 such tokens across all GloWbE varieties, all of which were found in the IndE component. This indicates that *the* in C2 is indeed a highly infrequent feature, as was already determined in the COCA and BNC data sets.

4.2.2 Stacked CCs

As discussed in section 3.2.2, there are various subtypes of stacked CCs, but it appears that the tripartite type – that is, C1C2C3 – has been the focus of attention in the literature. In all corpora, however, there were numerous examples of highly complex structures such as (4.16), whose semantic interpretation is not unambiguous; (4.17), where each apodosis is repeated as a protasis; and structures with up to six clauses (4.18). These examples illustrate how flexible the CC template is and how it is used creatively by speakers.

- (4.16) [*The more avenues men can enter,*]_{C1}
 [*the broader those avenues,*]_{C1'}
 [*the more avenues that each opens into,*]_{C1''}
 [*the freer they are;*]_{C2}
 [*the better men know what avenues lie before them, and how they are*]_{C3}
 [*the freer they will know themselves to be.*]_{C4}
 (COCA wlp_academic_rpe/wlp_acad_1999 ##4005393 Line: 13)
- (4.17) *But* [*the more she saw god*]_{C1} [*the more she feared,*]_{C2}
 and [*the more she feared*]_{C2} [*the more she became angry,*]_{C3}
 and [*the more angry she became*]_{C3} [*the more she hated,*]_{C4}
 and [*the more she hated*]_{C4} [*the more afraid of God she grew.*]_{C5}
 (BNC W_religion C8V)
- (4.18) [*The more a cricketer buys into the glitz and glamour in his playing days,*]_{C1}
 [*the more he loses touch with who he authentically is,*]_{C2}
 [*the more he looks for happiness out there,*]_{C3}
 [*the more he surrounds himself with false friends,*]_{C4}
 [*the fewer genuine relationships he has,*]_{C5}
 [*the more the likelihood of suffering this unfortunate hangover.*]_{C6}
 (GLOWBE-ZA wlp_zasl/wlp_zab01 ##3593685 Line: 49)

It was therefore decided to code the COCA, BNC, and GloWbE data (see Table 4.35 above), so that apart from iconic C1C2 and non-iconic C2C1 structures, it was also possible to determine the frequency of stacked CCs in each data set, with the caveat of not being able to compare the results from GloWbE with the other two corpora (see discussion in section 4.2.1). As the examples presented in section 3.2.2 show, the corpus data contained a great variety of stacked CCs, so that in the following, to facilitate the analysis and presentation of the data, they have been grouped as indicated in Table 4.43.

Table 4.43 Grouping and coding of stacked CCs

Factor	Levels
ORDER TYPE	C1C2, C2C1, C1C2C3, C3C2C1, OTHER STACKED

In the following, the data from COCA (4.2.2.1), BNC (4.2.2.2), and GloWbE (4.2.2.3) will be presented.

4.2.2.1 Stacked CCs in COCA

As Table 4.44 and Figure 4.35 show, the COCA data set contained 1,574 tokens in total, of which 1,409 (89.51%) feature C1C2 order, underscoring the dominance of the iconic CC. Of the remaining tokens, 39 (2.48%) were bi-clausal CC' constructions, leaving 126 tokens (8.00%) with stacked structures. Note that in these remaining tokens there were more tripartite C1C2C3 structures (50 tokens that amount to 3.18% overall) than non-iconic C2C1 structures. This is also reflected in a comparison of ratios; while the C1C2:C2C1 ratio in COCA was just over 36:1, the C1C2:C1C2C3 ratio is lower, amounting to just over 28:1. 76 were other types, such as Hoffmann's Types A and B (see section 3.2.2).

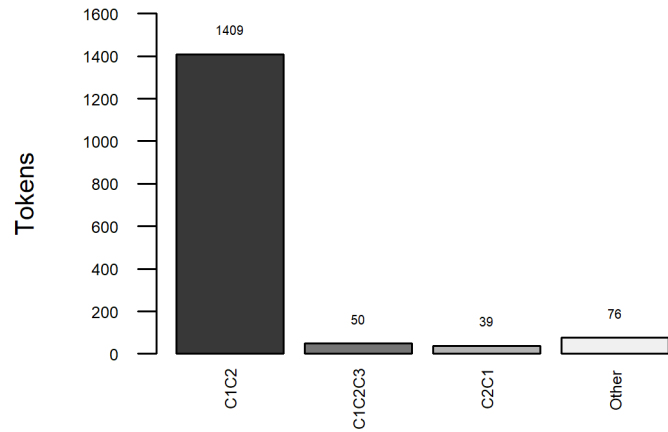


Figure 4.35 Order types, COCA

Table 4.44 Order types, COCA

ORDER TYPE	Tokens
C1C2	1409
C1C2C3	50
C2C1	39
Other stacked	76
Total	1574

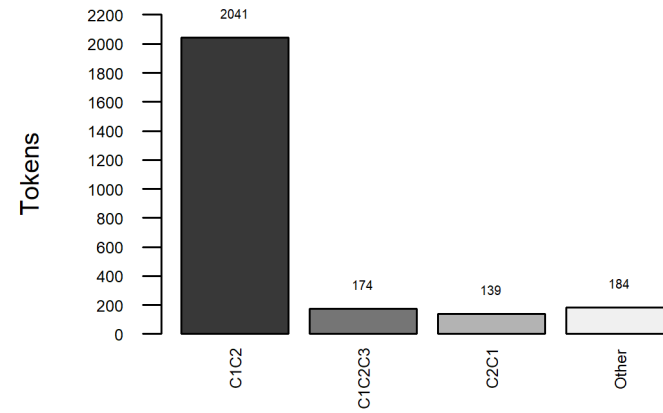


Figure 4.36 Order types, BNC

Table 4.45 Order types, BNC

ORDER TYPE	Tokens
C1C2	2041
C1C2C3	174
C2C1	139
Other stacked	184
Total	2538

4.2.2.2 Stacked CCs in BNC

Considering Hoffmann's ICE study, in which stacked tokens in BrE made up "almost one third" of all stacked tokens (2019: 201), it is unsurprising that there was a higher proportion of stacked CCs in the BNC data compared to COCA. As Table 4.45 and Figure 4.36 show, the BNC data set contained 2,538 tokens in total, of which 2,041 (80.42%) feature C1C2 order, and 139 (5.48%) were bi-clausal CC' constructions, leaving 358 tokens (14.11%) with stacked structures. Of these remaining tokens, a little less than half were C1C2C3 structures, which made up 174 tokens (6.86% of the total). The rest, 184 tokens, were other types of stacked clauses.

As was the case with COCA, the BNC data contains more tripartite CCs than CCs with the non-iconic C2C1 order. Compared to 3.18% in COCA, tripartite CCs made up almost 7% of the BNC data, amounting to a C1C2:C1C2C3 ratio of almost 12:1, in line with Hoffmann's ICE study (see discussion above). Note that as was the case in the COCA data set, this ratio is lower than the C1C2:C2C1 ratio, which was almost 15:1.

4.2.2.3 Stacked CCs in GloWbE

Table 4.46 and Figure 4.37 show that in total, the GloWbE data contained 5,715 C1C2 tokens and 539 stacked tokens (8.62%). Of these, 213 (3.41%) were of the C1C2C3 type. C2C1 structures are excluded from the analysis, because the corresponding data set is not comparable (as discussed above). Overall, the C1C2:C1C2C3 ratio in the GloWbE data set is almost 26:1, which is a little lower than the corresponding ratio in COCA (28:1) and considerably higher than that of the BNC data (12:1).

Table 4.47 shows the distribution of stacked CCs across DM stages, and Table 4.48 their distribution across varieties. Both tables also show C1C2:C1C2C3 ratios, which suggest that stacked CCs are less preferred in stage II varieties, where the ratio is never below 40:1. Also, as Table 4.47 shows, there is a slight trend towards higher proportions of the C1C2 order in the lower DM stages. The rest of the data is less consistent, which is probably due to the low amount of stacked CCs (e.g. only 1 token HKE and GhE) in some varieties, leading to very different ratios. In stage III alone, for example, there are ratios of up to 154:1 (HKE) and 112:1 (GhE), and as low as 9:1 (TanzE) or 13.54:1 (PhilE). Similarly, there is a ratio of 39:1 for JamE and only 12.63:1 for SAfE, both of which are in stage IV, and in stage V, NZE with just under 19:1 has a considerably lower ratio than IrE, with just over 39:1.

To obtain a better impression of whether there are any stage-specific effects, a covarying-collexeme analysis was carried out, with BrE separated from the stage V varieties. This was done against the background of Hoffmann's observation that almost one third of his stacked tokens were from the BrE component of ICE, and the fact that there was a considerable difference between COCA (3.18%) and BNC (6.86%) (see sections 4.2.2.1 and 4.2.2.2 above). The results of the covarying-collexeme analysis are presented in Table 4.49.

The results of the covarying-collexeme analysis show a strong attraction of the tripartite CC to stage IV varieties (2.541**), and an attraction of the 'other stacked' type to BrE (1.841*) and stage V (1.697*). Conversely, there is a strong repulsion (2.931**) of the 'other stacked' type of stacked CCs in the case of stage III varieties. Furthermore, there is significant attraction between the C1C2 order and stages II (1.527*) and III (1.826*). These findings suggest that stacked CCs are more entrenched in the higher DM stages (IV, V, and GB),

whereas in the lower DM stages the C1C2 order is preferred. The results of the covarying-collexeme analysis thus lend support to Hoffmann’s claims, who posited that “it is the strong entrenchment of the individual C1 and C2 clause as well as C1C2 constructions in BrE that accounts for this preference” of stacked clauses (2019: 204). In fact, given the results of the covarying-collexeme analysis, we can extend this observation from BrE to stages V and IV as well.

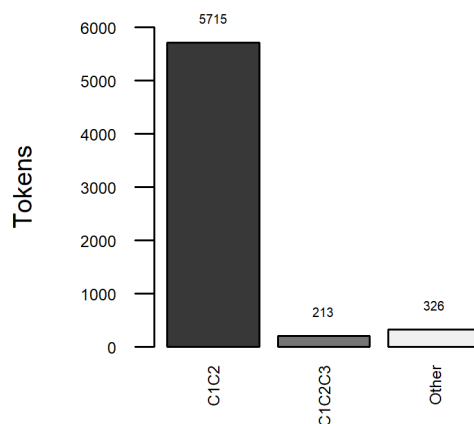


Figure 4.37 Order types, GloWbE

Table 4.46 Order types, GloWbE

ORDER TYPE	Tokens
C1C2	5715
C1C2C3	213
Other stacked	326
Total	6254

Table 4.47 C1C2 and C2C1 tokens across DM stages

ORDER	GB	Stage V	Stage IV	Stage III	Stage II
C1C2	1551	1953	479	1420	312
C1C2C3	52	70	30	54	7
OTHER STACKED	107	130	20	57	12
Total	1710	2153	529	1531	331
C1C2:C1C2C3	29.83	27.9	15.97	26.3	44.57

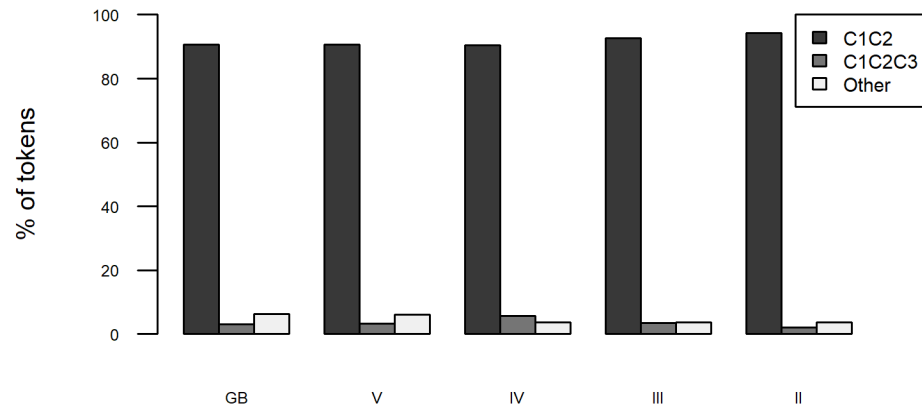


Figure 4.39 Order types across DM stages, GloWbE

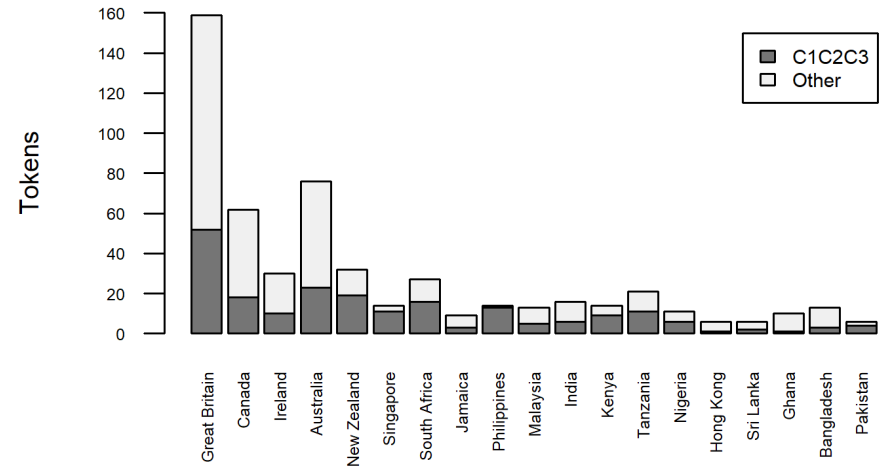


Figure 4.38 Total number of stacked tokens by GloWbE variety

Table 4.48 C1C2 and stacked CC tokens by GloWbE variety, grouped according to DM stage

ORDER	Stage V					Stage IV			Stage III								Stage II		
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
C1C2	1551	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174
C1C2C3	52	18	10	23	19	11	16	3	13	5	6	9	11	6	1	2	1	3	4
OTHER	107	44	20	53	13	3	11	6	1	8	10	5	10	5	5	4	9	10	2
C1C2:C1C2C3	29.83	31.78	39.1	27.39	18.95	14.55	12.63	39	13.54	31.4	52.33	15.33	9	26.67	154	55	112	46	43.5
Total	1710	634	421	706	392	174	229	126	190	170	330	152	120	171	160	116	122	151	180

Table 4.49 Covarying-collexeme analysis of DM stage and order types, GloWbE

DM STAGE	ORDER TYPE	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
IV	C1C2C3	529	213	30	18.02	attraction	2.451	**
GB	Other stacked	1710	326	107	89.14	attraction	1.841	*
III	C1C2	1531	5715	1420	1399.05	attraction	1.826	*
V	Other stacked	2153	326	130	112.23	attraction	1.697	*
II	C1C2	331	5715	312	302.47	attraction	1.527	*
III	C1C2C3	1531	213	54	52.14	attraction	0.389	n.s.
III	Other stacked	1531	326	57	79.81	repulsion	2.931	**
IV	Other stacked	529	326	20	27.58	repulsion	1.158	n.s.
V	C1C2	2153	5715	1953	1967.44	repulsion	1.029	n.s.
II	Other stacked	331	326	12	17.25	repulsion	0.960	n.s.
II	C1C2C3	331	213	7	11.27	repulsion	0.937	n.s.
GB	C1C2	1710	5715	1551	1562.62	repulsion	0.884	n.s.
GB	C1C2C3	1710	213	52	58.24	repulsion	0.732	n.s.
IV	C1C2	529	5715	479	483.41	repulsion	0.585	n.s.
V	C1C2C3	2153	213	70	73.33	repulsion	0.467	n.s.

4.3 Cross-clausal associations

To detect cross-clausal associations and shed light on the CC constructional network in English, covarying-collexeme analyses were carried out regarding lexical fillers (4.3.1), filler types (4.3.2), and deletion and truncation (4.3.3). Therefore, the COCA, BNC, and GloWbE data was coded as shown in Table 4.50:

Table 4.50 Coding of variables that were investigated regarding cross-clausal associations

Factor	Levels
LEXICAL FILLER C1, LEXICAL FILLER C2	e.g. <i>more, less, sooner, greater...</i>
FILLER TYPE C1, FILLER TYPE C2	ADVP, ADJP, NP, PP
DELETION C1, DELETION C2	BE-DELETED MV, BE-DELETED AUX, BE-RETAINED MV, BE-RETAINED AUX, FULL CLAUSE, Truncated

Furthermore, in line with Hoffmann et al.'s (2019) approach, interactions between filler types and deletion and truncation phenomena were also investigated (4.3.4). This will make it possible to get a more detailed picture of the meso-constructional CC network. Note that for the COCA and BNC data, covarying-collexeme analyses for some of these features have

already been carried out by Hoffmann et al. (2019; 2020). However, their findings are relevant for the present investigation, so that a summary of these studies, including a reproduction of selected results tables and plots, will be provided.

4.3.1 Lexical fillers

The first type of cross-clausal associations to be examined are lexical fillers. In the following, the results from previous studies (Hoffmann et al. 2019, 2020) will be presented (4.3.1.1), and a detailed analysis of GloWbE and its subcorpora will be discussed (4.3.1.2).

4.3.1.1 Lexical fillers in COCA and BNC

Table 4.51, reproduced from Hoffmann et al. (2019: 15), shows the results of a covarying-collexeme analysis of the C1 and C2 lexical filler slots in COCA. In their data, Hoffmann et al. found “965 different C1C2 LEXICAL FILLER pairs [...], 855 of which were hapaxes”, providing a good impression of the considerable “variability and productivity of the two constructional slots” (2019: 15). Note that because of this high degree of variation, the covarying-collexeme analyses yielded large results tables with several hundred rows. Thus, in the following only interactions with an expected frequency of $\geq 5^8$, exhibiting attraction, and a collostructional strength of ≥ 1.31 will be shown, a convention also adopted by Hoffmann et al. (2019).

Table 4.51 Covarying-collexeme analysis of LEXICAL FILLER in C1 and C2, COCA (from Hoffmann et al. 2019: 15) (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
<i>more</i>	<i>more</i>	285	232	115	46.93	attraction	0.299	0.351	28.315	***
<i>sooner</i>	<i>better</i>	41	208	26	6.05	attraction	0.501	0.113	12.293	***
<i>more</i>	<i>less</i>	285	31	16	6.27	attraction	0.043	0.321	4.081	***
<i>longer</i>	<i>greater</i>	122	69	14	5.97	attraction	0.072	0.122	2.799	**

Table 4.52 shows the results of a covarying-collexeme analysis of the BNC data. As was the case with COCA, there was also a large amount of filler pairs in the BNC data set – 1,248 in a data set consisting of 2,041 C1C2s, with 1,076 hapaxes, providing further evidence for the variability and productivity of the construction. Note that three out of five significantly associated lexical filler pairs are the same as in COCA ($more_{C1} \times more_{C2}$, $sooner_{C1} \times better_{C2}$, $more_{C1} \times less_{C2}$), suggesting strong entrenchment of these patterns in the standard varieties.

In both COCA ($\Delta P(C2C1) = 0.501$) and BNC ($\Delta P(C2C1) = 0.570$), a particularly high unidirectional cue validity could be determined for *sooner* in the pair $sooner_{C1} \times better_{C2}$, indicating that *sooner* in C1 strongly predicts *better* in C2. Moreover, moderately high cue validities in both directions could be determined for $more_{C1} \times more_{C2}$, with $\Delta P(C2C1)$ values of 0.299 (COCA) and 0.305 (BNC), and $\Delta P(C1C2)$ values of 0.351 (COCA) and 0.390

8 As Hoffmann et al. note, “it might be surprising that [the results table] does not contain entrenched lexical pairs such as *the more, the merrier*” (2019: 16). However, these did not show up in the data with a sufficient frequency to cross the expected frequency threshold of ≥ 5 . The author is aware that this is, in the words of Hoffmann et al., “a very conservative” threshold that means that not all entrenched meso-constructions can be found in the data.

(BNC), showing that *more* in C1 is a good predictor for *more* in C2, and vice versa. This in turn is evidence for the particularly strong entrenchment of these two lexical filler combinations.

Table 4.52 Covarying-collexeme analysis of LEXICAL FILLER in C1 and C2, BNC (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
<i>sooner</i>	<i>better</i>	139	376	99	25.61	attraction	0.570	0.239	45.421	***
<i>more</i>	<i>more</i>	377	278	145	51.35	attraction	0.305	0.390	43.547	***
<i>greater</i>	<i>greater</i>	88	202	36	8.71	attraction	0.324	0.150	14.595	***
<i>higher</i>	<i>greater</i>	118	202	33	11.68	attraction	0.192	0.117	8.155	***
<i>more</i>	<i>less</i>	377	60	20	11.08	attraction	0.029	0.153	2.421	**

4.3.1.2 Lexical fillers in GloWbE

Regarding the GloWbE data, separate covarying-collexeme analyses were carried out for each DM stage. The results are presented in Tables 4.53 (GB), 4.54 (stage V), 4.55 (stage IV), 4.56 (stage III), and 4.57 (stage II). Note that in the larger data sets (GB, stage V, stage III), a greater number of significant associations were found compared to the smaller data sets (stages IV and II). This is because covarying-collexeme analyses are statistical tests that “yield a greater number of significant results as sample size increases” (Hoffmann 2019: 176), as discussed in section 2.1.1.2. Thus, the results cannot be used as evidence that e.g. stage V varieties have more significantly associated lexical filler pairs than e.g. stage II varieties.

Note that across all stages (and corpora, as the results for COCA and BNC show), the combination $more_{C1} \times more_{C2}$, which is typically used in periphrastic comparative forms, turns out to be significantly associated. This indicates the strong entrenchment of this lexical filler pair across all varieties of English and in all DM stages, and explains why CCs have even been referred to as “MORE-MOREs” (Taylor 2004). Furthermore, where more lexical filler pairs could be detected, they were almost always the same, indicating their strong entrenchment across English varieties:

- $sooner_{C1} \times better_{C2}$ was detected in COCA, BNC, GloWbE-GB, and stages V and III
- $more_{C1} \times less_{C2}$ was detected in COCA, BNC, GloWbE-GB, and stages V and III
- $longer_{C1} \times greater_{C2}$ was detected in COCA and GloWbE stage V

Moreover, where such patterns were detected, particularly high unidirectional cue validities could be determined for *sooner* in $sooner_{C1} \times better_{C2}$ ($\Delta P(C2C1) = 0.565$ in GloWbE-GB, $\Delta P(C2C1) = 0.461$ in stage V, and $\Delta P(C2C1) = 0.559$ in stage III), indicating that *sooner* in C1 strongly predicts *better* in C2, i.e., this is a strongly entrenched pattern. This finding reflects the results from COCA and BNC, and the same applies to $more_{C1} \times more_{C2}$, with $\Delta P(C2C1)$ and $\Delta P(C1C2)$ values of close to or over 0.3 in GloWbE-GB and all DM stages.

Table 4.53 Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE-GB (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
sooner	better	110	314	80	22.27	attraction	0.565	0.231	34.716	***
more	more	412	284	161	75.44	attraction	0.283	0.369	32.783	***
less	better	35	314	16	7.09	attraction	0.261	0.036	3.286	***
more	less	412	37	17	9.83	attraction	0.024	0.199	2.096	**
bigger	better	34	314	12	6.88	attraction	0.154	0.020	1.545	*

Table 4.54 Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage V (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
more	more	486	345	183	85.85	attraction	0.266	0.342	35.528	***
sooner	better	116	314	69	18.65	attraction	0.461	0.191	27.703	***
longer	greater	150	85	17	6.53	attraction	0.076	0.129	3.820	***
more	less	486	61	24	15.18	attraction	0.024	0.149	2.097	**
older	more	46	345	14	8.13	attraction	0.131	0.021	1.643	*
more	easier	486	38	15	9.46	attraction	0.015	0.149	1.493	*

Table 4.55 Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage IV (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
more	more	138	107	71	30.83	attraction	0.409	0.483	19.960	***

Table 4.56 Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage III (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
more	more	411	297	187	85.96	attraction	0.346	0.430	43.468	***
sooner	better	53	229	37	8.55	attraction	0.558	0.148	18.294	***
earlier	better	51	229	32	8.22	attraction	0.484	0.124	13.736	***
more	less	411	32	18	9.26	attraction	0.030	0.279	3.005	***

Table 4.57 Covarying-collexeme analysis of LEXICAL FILLERS in C1 and C2, GloWbE stage II (expected frequency ≥ 5 , Coll. strength ≥ 1.31 , attraction only)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
<i>more</i>	<i>more</i>	87	63	44	17.57	attraction	0.421	0.526	14.49	***

Finally, to investigate the entrenchment of periphrastic forms, the GloWbE data was coded as shown in Table 4.58. This was done for all relevant tokens, that is, where FILLER TYPES were AdjPs or AdvPs, and where speakers would have a choice⁹ between what Quirk et al. refer to as “inflected forms in *-er* and *-est* or their periphrastic equivalents with *more* and *most*” (1985: 458).

Table 4.58 Coding of variable PERIPHRASTIC FORM in C1 and C2

Factor	Levels
PERIPHRASTIC FORM C1	TRUE, FALSE
PERIPHRASTIC FORM C2	TRUE, FALSE

In the GloWbE data, there were instances of innovative uses of periphrastic comparatives, including *more ill* (4.19) where, according to Quirk et al., *worse* should be the only option (1985: 459), and cases such as “[a]djectives with the negative *un-*prefix”, where speakers are more free to choose between periphrastic and non-periphrastic comparative forms (cf. Quirk et al. 1985: 462), but opted for the former (4.20). Other examples of unusual periphrastic comparative forms include *more little* (4.21), *more healthy* (4.22), and *more white* (4.23).

(4.19) [*The more ill they are the next day*]_{C1} [*the more kudos they get from their peers*]_{C2}
(GLOWBE-GB wlp_gb_blog_akq/wlp_gb_b04 ##3137749 Line: 19)

(4.20) *As long as the result falls within his predictions Nate wins -*
[*the more unlikely*]_{C1} [*the more it falls out with the polls*]_{C2}
(GLOWBE-GB wlp_gb_blog_akq/wlp_gb_b06 ##3148282 Line: 44)

(4.21) [*the lower the weight of rod*]_{C1} [*the more little the fish you’ll be after*]_{C2}
(GLOWBE-BD wlp_bd_lws/wlp_bd_b01 ##3510800 Line: 26)

(4.22) [*The better we view our sugar and carbs*]_{C1} [*the more healthy our company is*]_{C2}
(GLOWBE-HK wlp_hk_wjj/wlp_hk_b01 ##3573461 Line: 19)

(4.23) *All other things being equal, [the less urban the area]*_{C1} [*the more white the population tends to be*]_{C2}
(GLOWBE-GB wlp_gb_blog_akq/wlp_gb_b07 ##3694592 Line: 16)

These examples support Hoffmann’s claim, discussed in section 3.3.1, that “adjectives [...] which would normally have a synthetic comparative form [...] can appear more freely with an analytic comparative [...] in CC constructions” (2019: 49), indicating the entrenchment of a corresponding *more*_{C1} × *more*_{C2} meso-constructional template – the same that was identified as statistically significant in all corpora and across all stages. Actually, as the results of the variety-specific covarying-collexeme analyses provided in section 4.4 show, in only five

⁹ For a detailed overview of the adverbs and adjectives that fall into this category and that were thus included in the analysis, cf. Quirk et al. (1985: 458-65).

(SingE, PhilE, TanzE, HKE, PakE) out of the 19 GloWbE varieties could this pattern not be determined as statistically significant.

Another interesting observation is that there were tokens in which *more* is combined with synthetic comparatives, as in *more clearer* (4.24), *more closer* (4.25), and *more cooler* (4.26).

(4.24) [*The lower we went*]_{C1} [*the **more clearer** we could see the tracks on the ground made by the vans.*]_{C2}

(GLOWBE-IN wlp_in_ksi/wlp_in_b01 ##3469300 Line: 67)

(4.25) [*The more people come to know your tricks,*]_{C1} [*the **more closer** you get to your ultimate destiny.*]_{C2}

(GLOWBE-LK wlp_lk_ssy/wlp_lk_g01 ##928404 Line: 474)

(4.26) *Now* [*the more cooling fans you add to your rig*]_{C1} [*the **more cooler** it gets*]_{C2}

(GLOWBE-PH wlp_ph_jop/wlp_ph_g02 ##1090761 Line: 58)

Hoffmann found three such examples in the PhilE component of ICE, and while there were no more than four such cases in the entire GloWbE data set, they can be seen as evidence that cognitively, speakers of these varieties (IndE, SriLE, PhilE) have entrenched *more* as a fixed, construction-specific element and no longer perceive it as an adverb that is used to form comparatives, therefore using the (seemingly redundant) synthetic comparative forms with the suffix *-er*. In Hoffmann's words, this also "illustrates how the network of constructions of all levels of schematicity influences the production of constructs in a specific PCE" (2019: 231).

Note that most examples of unusual periphrastic forms (cf. 4.19-4.23) and 'redundant' forms (4.24-4.26) were found in C2 clauses, suggesting a deeper entrenchment of construction-specific *more* in C2. In fact, as Tables 4.60 and 4.61, and figures 4.41 and 4.40 show, the proportion of periphrastic (i.e., analytic) comparative forms is considerably higher in C2 than in C1¹⁰, and this is the same across all DM stages. In fact, the proportion of periphrastic fillers is consistently at almost 20% through all stages. It is also noteworthy that most of the 271 periphrastic fillers tokens in C2 are of one particular type – *more likely* – with 228 tokens (84%). This suggests a strong entrenchment of this particular lexical filler in the C2 clause. Thus, there are no *stage*-specific qualitative meso-constructional innovations but *clause*-specific ones, that is, they are clearly more characteristic of C2 than C1. This is an interesting finding that will require more in-depth research in the future.

4.3.2 Filler types

Moving on to a more abstract level of the meso-constructional network, cross-clausal associations regarding filler types in COCA and BNC (4.3.2.1), and GloWbE (4.3.2.2) were also investigated. In addition to the covarying-collexeme analyses, a HCFA that tested filler type configurations across GloWbE stages will be presented. Furthermore, because Hoffmann et al. found that some lexical fillers were "strongly tied to specific phrasal categories" (2019: 16), additional covarying-collexeme analyses will be carried out to test whether cross-clausal filler associations are influenced by lexical effects (4.3.2.3). If this were the case, it would challenge the postulation of abstract meso-constructions, one of the primary aims of this study, which seeks to shed light on the meso-constructional network behind the English CC.

¹⁰ Note that the three examples of 'redundant' analytic + synthetic forms that Hoffmann found in his ICE study were also restricted to C2 (2019: 230).

4.3.2.1 Filler types in COCA and BNC

Tables 4.62 (COCA) and 4.63 (BNC) show the frequencies of filler types¹¹ in C1 and C2, as indicated by Hoffmann et al. (2019: 13 and 2020: 206). The frequencies are visualized in Figures 4.43 (COCA) and 4.42 (BNC), mosaic plots that look strikingly similar. According to Friendly and Meyer (2016: 162, emphasis JH), mosaic plots can be read

like a grouped barchart, where the heights (or widths) of the bars show the relative frequencies of one variable, and the widths (heights) of the sections in each bar show the conditional frequencies of the second variable, given the first. This gives an *area-proportional visualization of the frequencies* composed of tiles corresponding to the cells created by successive vertical and horizontal splits of rectangle, representing the total frequency in the table.

With their large squares (i.e., very similar edge lengths) the mosaic plots indicate “a mutual association of FILLER TYPEs across C1 and C2” (Hoffmann et al. 2019: 13) in the data. The covarying-collexeme analyses, whose results are shown in Tables 4.59 (COCA, from Hoffmann et al. 2019) and 4.64 (BNC, from Hoffmann et al. 2020), confirm what the mosaic plots intuitively suggest: strong parallelism regarding filler type associations.

In fact, in both data sets, those pairs that the covarying-collexeme analyses, whose results are shown in Tables 4.59 (COCA) and 4.64 (BNC), determined to be statistically significantly associated are exactly the same symmetric patterns: AdvP_{C1} × AdvP_{C2} (4.27), AdjP_{C1} × AdjP_{C2} (4.28), and NP_{C1} × NP_{C2} (4.29).

(4.27) [*The [quicker]_{AdvP} they can pay back the loan,*]_{C1}

[*the [longer]_{AdvP} that money will have to grow over time.*]_{C2}

(COCA wlp_newspaper_lsp/wlp_news_1999 ##3035460 Line: 104)

(4.28) [*The [smaller]_{AdjP} you are,*]_{C1} [*the [more aggressive]_{AdjP} your stance needs to be.*]_{C2}

(COCA wlp_magazine_qri/wlp_mag_2011 ##4110117 Line: 6)

(4.29) [*First of all, [the [more water-furrows]_{NP} in a field]*]_{C1} [*[the [more land]_{NP} is wasted.*]_{C2}

(BNC W_non_ac_soc_science G09)

Table 4.59 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, COCA (adapted from Hoffmann et al. 2019: 14) (expected frequency ≥5, only significant results)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	637	480	284	217.00	attraction	0.192	0.212	13.544	***
AdjP	AdjP	551	747	338	292.12	attraction	0.137	0.131	6.494	***
NP	NP	214	172	46	26.12	attraction	0.110	0.132	4.728	***
AdjP	AdvP	551	480	132	187.71	repulsion	-0.166	-0.176	10.226	***
AdvP	NP	637	172	50	77.76	repulsion	-0.080	-0.184	5.532	***
AdvP	AdjP	637	747	299	337.71	repulsion	-0.111	-0.110	4.687	***
NP	AdvP	214	480	61	72.90	repulsion	-0.066	-0.038	1.445	*

¹¹ As noted in section 1.1, special constructions were excluded from analysis. Thus, figures and tables based on Hoffmann et al. (2020) look slightly different.

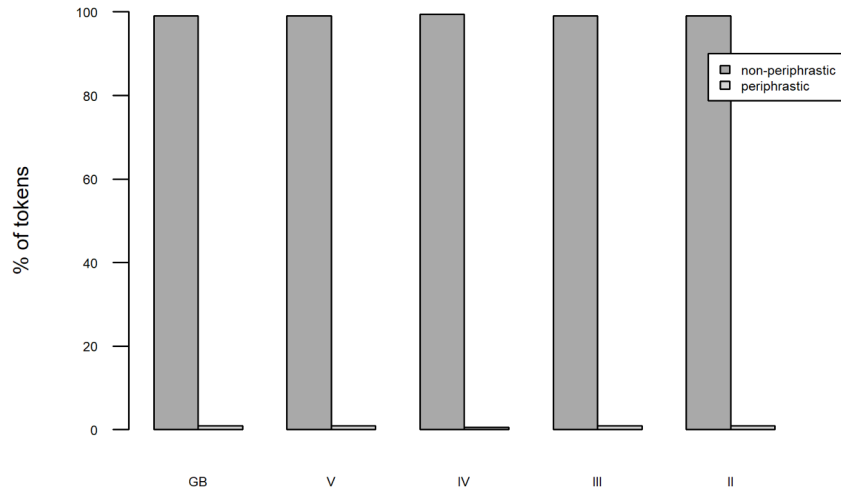


Figure 4.41 Percentage of periphrastic vs. non-periphrastic lexical fillers in C1, GloWbE

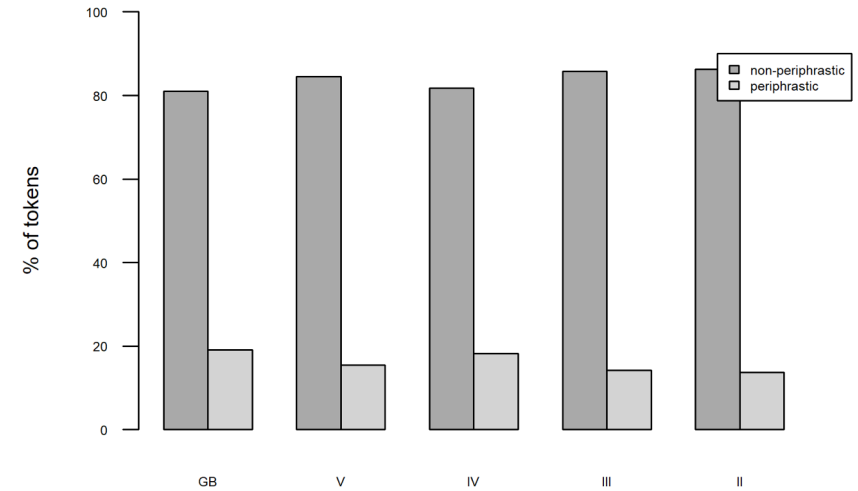


Figure 4.40 Percentage of periphrastic vs. non-periphrastic lexical fillers in C2, GloWbE

Table 4.60 Frequency of periphrastic vs. non-periphrastic lexical fillers in C1, GloWbE

PERIPH. FORM C1	GB	Stage V	Stage IV	Stage III	Stage II
FALSE	608	809	186	533	111
TRUE	6	8	1	5	1
Total	614	817	187	538	112

Table 4.61 Frequency of periphrastic vs. non-periphrastic lexical fillers in C2, GloWbE

PERIPH. FORM C2	GB	Stage V	Stage IV	Stage III	Stage II
FALSE	340	517	112	362	69
TRUE	80	95	25	60	11
Total	420	612	137	422	80

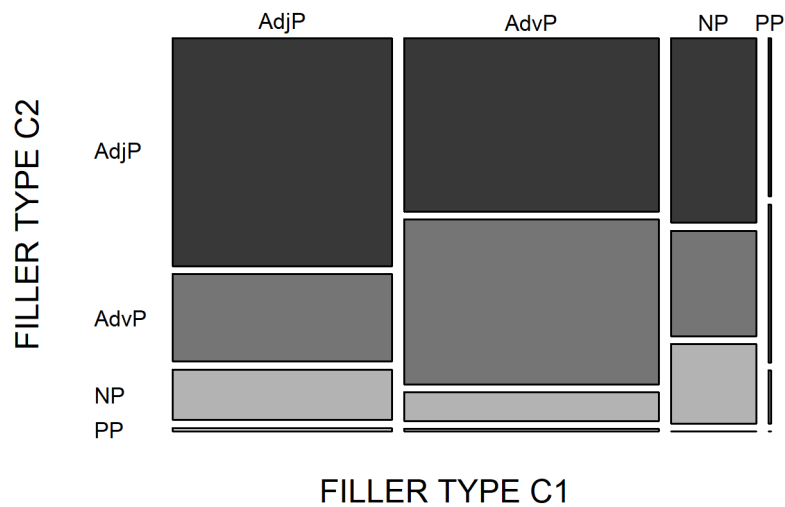


Figure 4.43 FILLER TYPE association across C1 and C2, COCA (based on Hoffmann et al. 2019: 13)

Table 4.62 FILLER TYPE frequencies in C1 and C2, COCA (from Hoffmann et al. 2019: 14)

FILLER TYPE	Tokens in C1	Tokens in C2
AdjP	551	747
AdvP	637	480
NP	214	172
PP	7	10

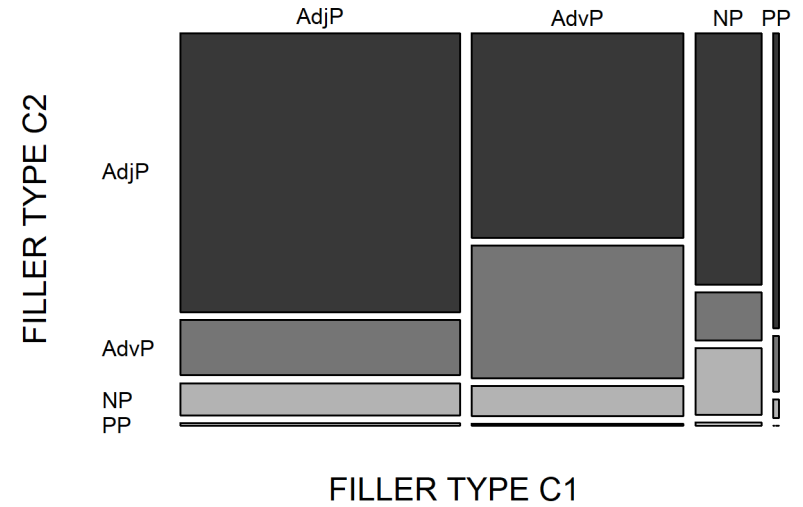


Figure 4.42 FILLER TYPE association across C1 and C2, BNC (based on Hoffmann et al. 2020: 206)

Table 4.63 FILLER TYPE frequencies in C1 and C2, BNC (from Hoffmann et al. 2020: 206)

FILLER TYPE	Tokens in C1	Tokens in C2
AdjP	1015	1368
AdvP	769	463
NP	236	194
PP	20	12

Table 4.64 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, BNC (adapted from Hoffmann et al. 2020: 207) (expected frequency ≥ 5 , only significant results)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	769	463	275	174.45	attraction	0.210	0.281	26.647	***
AdjP	AdjP	1015	1368	765	680.31	attraction	0.166	0.188	15.068	***
NP	NP	236	194	43	22.43	attraction	0.099	0.117	5.183	***
AdvP	AdjP	769	1368	428	515.43	repulsion	-0.182	-0.194	16.626	***
AdjP	AdvP	1015	463	153	230.25	repulsion	-0.151	-0.216	15.839	***
NP	AdvP	236	463	31	53.54	repulsion	-0.108	-0.063	4.184	***
AdvP	NP	769	194	62	73.09	repulsion	-0.023	-0.063	1.315	*

When compared to lexical fillers (cf. section 4.3.1) and deletion/ truncation patterns (cf. section 4.3.3), the unidirectional cue validities are quite low, with ΔP values of around 0.2 in both directions, suggesting that the filler type associations are not as deeply entrenched as lexical filler and deletion/ truncation patterns.

4.3.2.2 Filler types in GloWbE

Table 4.65 shows the frequencies of filler types in C1 and C2 in the GloWbE data set. The mosaic plot (Figure 4.44) bears strong resemblance to its COCA and BNC counterparts, revealing a strong preference for AdjPs and AdvPs.

Table 4.67 and Figure 4.45 show the frequencies of C1 filler types in each GloWbE variety. Figure 4.46 shows the proportion, in per cent, of C1 filler types in each variety. Likewise, Table 4.68 Figure 4.47 show the frequencies of C2 filler types in each GloWbE variety. Figure 4.48 shows the proportion, in per cent, of C2 filler types in each variety. The picture that emerges is one of general similarity across varieties: In C1, the proportion of AdjPs and AdvPs is more balanced than in C2, where there is a higher proportion of AdjPs. Two varieties stand out: In the HKE data, there is a considerably higher proportion of AdjPs in C1 than in the other varieties, and in the BangE data, the proportion of NPs is higher than in the other varieties.

To determine possible filler type associations across C1 and C2, the GloWbE data was subjected to covarying-collexeme analyses, whose results are presented in Tables 4.66-4.72. They reveal exactly the same symmetric patterns for every GloWbE stage, mirroring the results of COCA and BNC (see section 4.3.2.1): The only significant cross-clausal associations are $AdvP_{C1} \times AdvP_{C2}$ (4.30), $AdjP_{C1} \times AdjP_{C2}$ (4.31), and $NP_{C1} \times NP_{C2}$ (4.32).

(4.30) For reactive media, [the **faster**]_{AdvP} you respond,]_{C1}

[the **faster**]_{AdvP} you can contribute to the discussion out there.]_{C2}

(GLOWBE-AU wlp_au_kso/wlp_au_b02 ##3312090 Line: 9)

(4.31) [The **more intense**]_{AdjP} the competition in your industry is,]_{C1} [the **more flexible**]_{AdjP} your product pricing strategy and policy will have to be.]_{C2}

(GLOWBE-NG wlp_ng_kdt/wlp_ng_g02 ##1230678 Line: 25)

(4.32) [*The [more baobab]_{NP} we eat in the UK and Europe,*]_{C1} [*the [more people in Africa]_{NP} stand to benefit,*]_{C2} *says Riley.*
 (GLOWBE-TZ wlp_tz_niy/wlp_tz_g01 ##1851520 Line: 21)

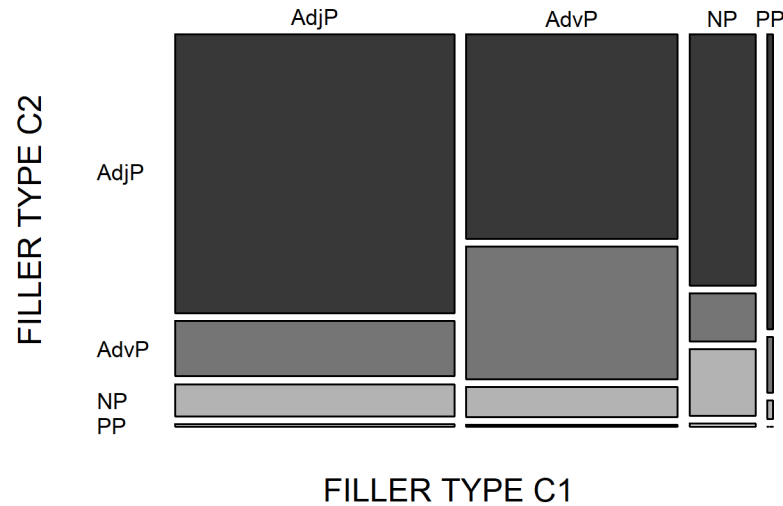


Figure 4.44 FILLER TYPE association across C1 and C2, GloWbE

Table 4.65 FILLER TYPE frequencies in C1 and C2, GloWbE

FILLER TYPE	Tokens in C1	Tokens in C2
AdjP	1969	3202
AdvP	2654	1646
NP	1028	815
PP	41	29

Table 4.66 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE-GB (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	774	415	275	207.77	attraction	0.174	0.221	14.209	***
AdjP	AdjP	493	913	340	291.14	attraction	0.145	0.131	7.516	***
NP	NP	267	211	63	36.44	attraction	0.120	0.146	6.139	***
PP	AdjP	12	913	9	7.09	attraction	0.161	0.005	0.689	n.s.
AdjP	AdvP	493	415	87	132.34	repulsion	-0.135	-0.149	8.115	***
AdvP	AdjP	774	913	414	457.09	repulsion	-0.111	-0.115	5.288	***
AdvP	NP	774	211	82	105.64	repulsion	-0.061	-0.130	3.535	***
NP	AdvP	267	415	52	71.67	repulsion	-0.089	-0.065	2.840	**
NP	AdjP	267	913	150	157.68	repulsion	-0.035	-0.021	0.788	n.s.
AdjP	NP	493	211	64	67.28	repulsion	-0.010	-0.018	0.480	n.s.

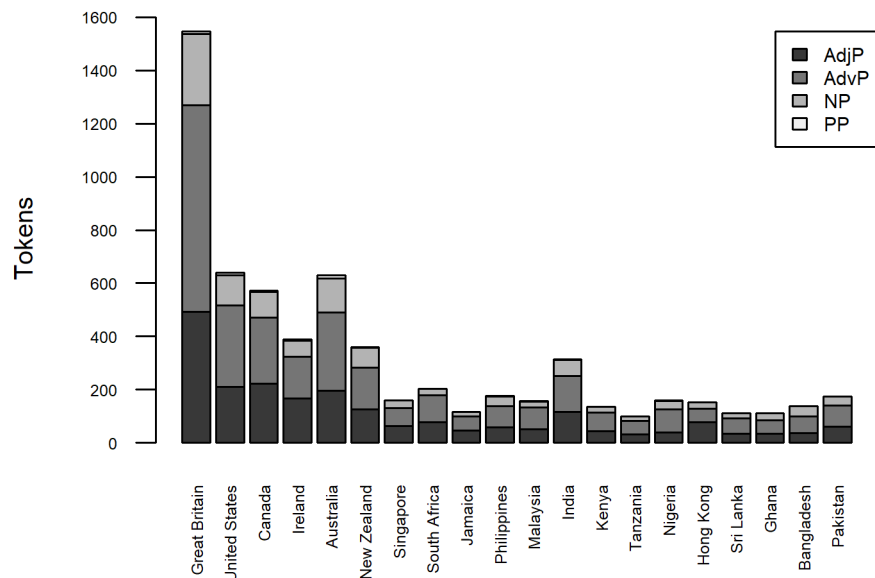


Figure 4.45 C1 FILLER TYPE tokens by GloWbE variety

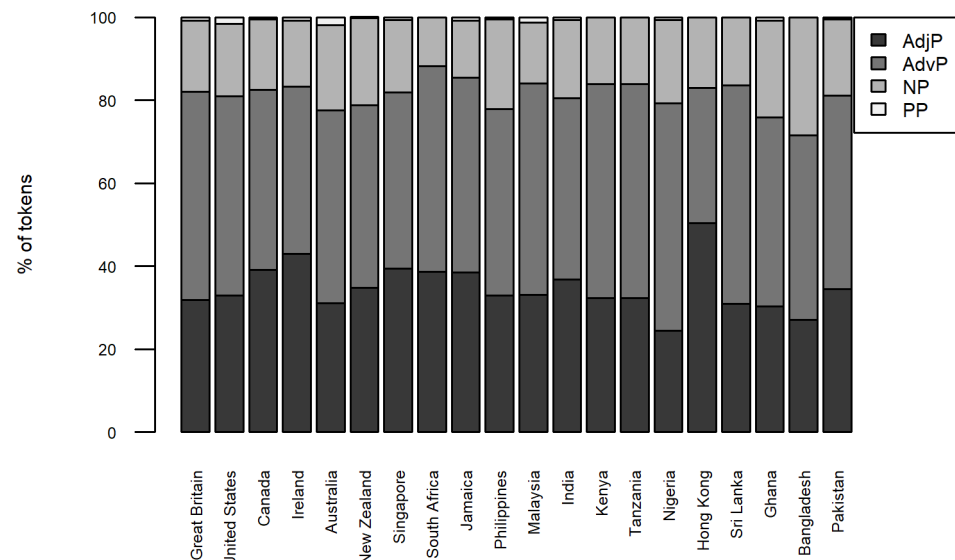


Figure 4.46 C1 FILLER TYPE tokens by GloWbE variety, percentages

Table 4.67 C1 FILLER TYPE tokens by GloWbE variety, grouped according to DM stage

FILLER TYPE C1	Stage V					Stage IV			Stage III									Stage II	
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhlE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
AdjP	493	222	167	196	125	63	78	45	58	51	115	44	32	38	77	34	34	37	60
AdvP	774	247	156	293	157	68	100	55	79	80	137	70	51	87	50	58	51	61	80
NP	267	97	62	129	75	28	24	16	38	23	59	22	16	31	26	18	26	39	32
PP	12	3	3	12	1	1	0	1	1	2	2	0	0	1	0	0	1	0	1
Total	1546	569	388	630	358	160	202	117	176	156	313	136	99	157	153	110	112	137	173

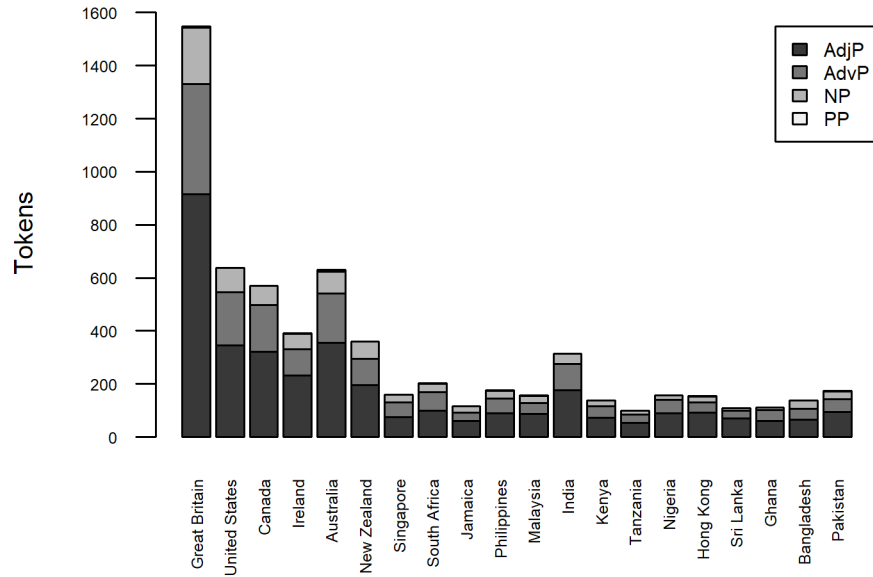


Figure 4.47 C2 FILLER TYPE tokens by GloWbE variety

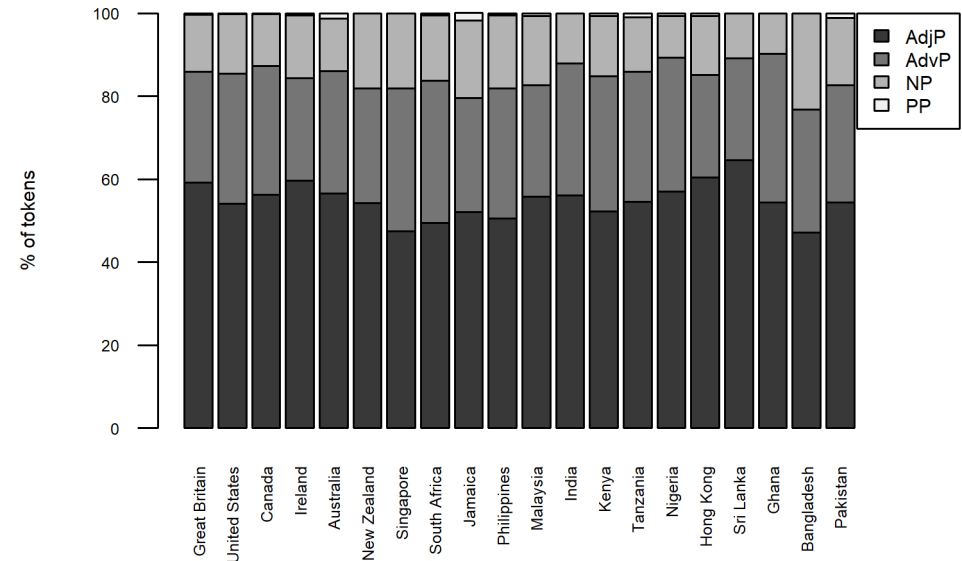


Figure 4.48 C2 FILLER TYPE tokens by GloWbE variety, percentages

Table 4.68 C2 FILLER TYPE tokens by GloWbE variety, grouped according to DM stage

FILLER TYPE C2	Stage V					Stage IV			Stage III									Stage II	
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
AdjP	913	320	232	356	194	76	100	61	89	87	176	71	54	89	93	71	61	65	94
AdvP	415	176	95	186	99	55	69	32	55	42	100	45	31	51	38	27	40	41	49
NP	211	72	59	80	65	29	32	22	31	26	37	19	13	16	21	12	11	31	28
PP	7	1	2	8	0	0	1	2	1	1	0	1	1	1	1	0	0	0	2
Total	1546	569	388	630	358	160	202	117	176	156	313	136	99	157	153	110	112	137	173

Table 4.69 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage V (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	853	556	342	243.84	attraction	0.205	0.247	22.551	***
AdjP	AdjP	710	1102	481	402.27	attraction	0.175	0.165	13.469	***
NP	NP	363	276	89	51.51	attraction	0.127	0.158	8.553	***
PP	AdvP	19	556	7	5.43	attraction	0.083	0.004	0.546	n.s.
PP	AdjP	19	1102	11	10.77	attraction	0.012	0.000	0.257	n.s.
AdjP	AdvP	710	556	134	202.96	repulsion	-0.153	-0.174	12.779	***
AdvP	AdjP	853	1102	412	483.29	repulsion	-0.149	-0.149	10.485	***
NP	AdvP	363	556	73	103.77	repulsion	-0.104	-0.077	4.497	***
AdvP	NP	853	276	96	121.04	repulsion	-0.052	-0.106	3.223	***
AdjP	NP	710	276	90	100.75	repulsion	-0.024	-0.045	1.083	n.s.
NP	AdjP	363	1102	198	205.67	repulsion	-0.026	-0.016	0.699	n.s.

Table 4.70 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage IV (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	223	156	104	72.63	attraction	0.263	0.298	9.180	***
AdjP	AdjP	186	237	118	92.03	attraction	0.228	0.217	6.094	***
NP	NP	68	83	19	11.78	attraction	0.124	0.105	1.893	*
AdjP	NP	186	83	34	32.23	attraction	0.016	0.026	0.427	n.s.
AdjP	AdvP	186	156	34	60.58	repulsion	-0.234	-0.253	7.329	***
AdvP	AdjP	223	237	88	110.34	repulsion	-0.187	-0.187	4.521	***
AdvP	NP	223	83	29	38.64	repulsion	-0.081	-0.141	1.885	*
NP	AdvP	68	156	18	22.15	repulsion	-0.071	-0.039	0.812	n.s.
NP	AdjP	68	237	30	33.65	repulsion	-0.062	-0.030	0.688	n.s.

Table 4.71 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage III (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdvP	AdvP	663	429	285	201.44	attraction	0.238	0.280	21.738	***
NP	NP	259	186	70	34.12	attraction	0.170	0.222	10.870	***
AdjP	AdjP	483	791	325	270.58	attraction	0.171	0.156	9.388	***
AdjP	AdvP	483	429	92	146.75	repulsion	-0.172	-0.183	11.202	***
AdvP	NP	663	186	52	87.34	repulsion	-0.100	-0.219	7.940	***
AdvP	AdjP	663	791	324	371.41	repulsion	-0.135	-0.136	6.643	***
NP	AdvP	259	429	49	78.69	repulsion	-0.140	-0.099	5.492	***
NP	AdjP	259	791	139	145.09	repulsion	-0.029	-0.018	0.659	n.s.
AdjP	NP	483	186	63	63.62	repulsion	-0.002	-0.004	0.306	n.s.

Table 4.72 Covarying-collexeme analysis of FILLER TYPE across C1 and C2, GloWbE stage II (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
AdjP	AdjP	97	159	76	49.75	attraction	0.394	0.339	10.253	***
AdvP	AdvP	141	90	64	40.94	attraction	0.300	0.361	8.251	***
NP	NP	71	59	25	13.51	attraction	0.210	0.240	3.817	***
AdjP	AdvP	97	90	8	28.16	repulsion	-0.303	-0.316	8.183	***
AdvP	AdjP	141	159	55	72.32	repulsion	-0.225	-0.224	4.232	***
NP	AdjP	71	159	27	36.42	repulsion	-0.172	-0.122	2.106	**
AdjP	NP	97	59	13	18.46	repulsion	-0.082	-0.114	1.234	n.s.
AdvP	NP	141	59	21	26.84	repulsion	-0.076	-0.122	1.223	n.s.
NP	AdvP	71	90	18	20.61	repulsion	-0.048	-0.041	0.573	n.s.

Furthermore, to test for stage-specific effects, a HCFA was carried out, whose results are shown in Table 4.73. The HCFA results provide further evidence for the strong preference of symmetric structures across all stages, revealing the following types, that is, subschemas:

- $\text{AdvP}_{C1} \times \text{AdvP}_{C2}$ in BrE and stages V, IV, and III;
- $\text{AdjP}_{C1} \times \text{AdjP}_{C2}$ in stage V;
- and $\text{NP}_{C1} \times \text{NP}_{C2}$ in stages V, III.

It is striking that these three types (i.e., $\text{AdvP}_{C1} \times \text{AdvP}_{C2}$, $\text{AdjP}_{C1} \times \text{AdjP}_{C2}$, and $\text{NP}_{C1} \times \text{NP}_{C2}$) correspond *exactly* to the cross-clausal associations determined as statistically significant by the covarying-collexeme analyses across all corpora (COCA, BNC, and the various GloWbE

components). This underscores the reliability of the statistical tests (Covarying-collexeme analysis and HCFA) employed in the present study.

Also note that none of the anti-types were symmetric. These results thus reflect the findings of the covarying-collexeme analyses, that is, across all DM stages only symmetric patterns are statistically significant, and thus entrenched.

Table 4.73 HCFA of FILLER TYPEs, GloWbE (expected frequency ≥ 5 , only significant results)

DM stage	FILLER TYPE C1	FILLER TYPE C2	Freq.	Exp.	Cont. chisq.	Obs-exp	p-value	DEC.	Q
V	AdjP	AdjP	481	378.49	27.763	>	<0.001	***	0.020
V	AdvP	AdjP	412	510.17	18.889	<	<0.001	***	0.019
III	AdvP	AdvP	285	190.39	47.019	>	<0.001	***	0.017
V	AdvP	AdvP	342	262.25	24.250	>	<0.001	***	0.015
GB	AdjP	AdvP	87	154.65	29.594	<	<0.001	***	0.012
GB	AdvP	AdvP	275	208.45	21.244	>	<0.001	***	0.012
V	AdjP	AdvP	134	194.57	18.853	<	<0.001	***	0.011
III	AdjP	AdvP	92	141.25	17.171	<	<0.001	***	0.009
III	AdvP	NP	52	94.27	18.952	<	<0.001	***	0.008
IV	AdvP	AdjP	88	125.64	11.276	<	0.014	*	0.010
IV	AdvP	AdvP	104	64.59	24.053	>	<0.001	***	0.007
V	NP	NP	89	50.3	29.782	>	<0.001	***	0.007
III	NP	NP	70	36.51	30.710	>	<0.001	***	0.006
GB	NP	AdvP	52	80.74	10.232	<	0.025	*	0.005
GB	NP	NP	63	39.98	13.256	>	0.028	*	0.004
II	AdjP	AdvP	8	31.01	17.074	<	<0.001	***	0.004
II	NP	NP	25	8.02	35.981	>	<0.001	***	0.003

4.3.2.3 Filler type and lexical filler interactions

To test whether any of the cross-clausal associations determined above could be attributed to lexical effects, separate covarying-collexeme analyses were carried out on the data sets, such that the factors LEXICAL FILLER C1 and FILLER TYPE C1, and LEXICAL FILLER C2 and FILLER TYPE C2 were collapsed. This methodology is based on Hoffmann et al. (2019), whose results (for COCA) are presented in Table 4.74. As the table shows (see also the discussion in section 3.3.2), Hoffmann et al. were able to show that the $more_{AdvP} \times more_{AdvP}$ (collostructional strength: 28.977***) lexical filler combination “functions as a strong prototype for the abstract AdvP-AdvP meso-construction”, although they also note that this lexical filler combination made up less than half ($112/284=39.43\%$) of all the $AdvP_{C1} \times AdvP_{C2}$ tokens in their data, leading them to conclude that the “AdvP-AdvP association effect cannot be fully explained by lexical effects” (2019: 16).

As Table 4.75 shows, similar conclusions can be drawn from a covarying-collexeme analysis of the BNC data set: Even though $more_{AdvP} \times more_{AdvP}$ (collostructional strength:

44.265***) was the most frequent combination with 143 tokens, this amounts to just over one half of the total number of AdvP_{C1} × AdvP_{C2} tokens (143/275=52.00%) in the BNC data. Furthermore, as was the case in Hoffmann et al.'s COCA study, neither does the NP_{C1} × NP_{C2} pair seem to exhibit a lexical prototype (2019: 16).

However, unlike in the COCA data, there do appear to be two lexical prototypes for the AdjP_{C1} × AdjP_{C2} pattern; *greater*_{AdjP} × *greater*_{AdjP} (collostructional strength 14.860***) (4.33) and *higher*_{AdjP} × *greater*_{AdjP} (collostructional strength 8.531***) (4.34) in BNC.

(4.33) *And [the [greater]_{AdjP} the capacity of the imagination]_{C1}*

[the [greater]_{AdjP} the emotion to fear.]_{C2}

(BNC W_biography EVH)

(4.34) *Therefore [the [higher]_{AdjP} the level of cholesterol in the blood]_{C1}*

[the [greater]_{AdjP} the risk of problems with the heart.]_{C2}

(BNC W_misc BN5)

Unlike *more*_{AdvP} × *more*_{AdvP} (see above), both *greater*_{AdjP} × *greater*_{AdjP} (36 out of 764 AdjP_{C1} × AdjP_{C2} tokens = 4.71%) and *higher*_{AdjP} × *greater*_{AdjP} (33 out of 764 AdjP_{C1} × AdjP_{C2} tokens = 4.32%) make up only a fraction of the overall data. From this it can be concluded that neither of these combinations can account for the AdjP_{C1} × AdjP_{C2} association effect. Turning to the GloWbE data, as Tables 4.76 to 4.80 show, *more*_{AdvP} × *more*_{AdvP} (4.35) turns out to be a strong prototype for the AdvP_{C1} × AdvP_{C2} combination across all stages.

(4.35) *[The [more]_{AdvP} man probes nature's laws,]_{C1}*

[the [more]_{AdvP} he seems to control nature.]_{C2}

(GLOWBE-IN wlp_in_ksi/wlp_in_g03 ##859478 Line: 18)

These results reflect the findings from COCA and BNC, although the proportion of *more*_{AdvP} × *more*_{AdvP} is generally higher, with percentages close to 70% (except for stage V):

- GLOWBE-GB: 161/275=69.45%;
- stage V: 181/342=52.92%;
- stage IV: 70/104=67.31%;
- stage III: 187/285=65.61%;
- stage II: 44/64=68.75%.

This means that, perhaps with the exception of stage V, the filler type combination AdvP_{C1} × AdvP_{C2} can be attributed to lexical effects to a certain degree. As was the case with the BNC data, there also appear to be several other lexical prototypes in the GloWbE data: *more*_{AdvP} × *less*_{AdvP} in GloWbE-GB (4.36), stage V, and stage III, and *bigger*_{AdjP} × *better*_{AdjP} in GloWbE-GB (4.37).

(4.36) *[The [more]_{AdvP} I drank fresh coffee,]_{C1} [the [less]_{AdvP} I drank instant.]_{C2}*

(GLOWBE-GB wlp_gb_blog_akq/wlp_gb_b04 ##3051750 Line: 3)

(4.37) *But I really like wearing a skirt and [the [bigger]_{AdjP}]_{C1} [the [better]_{AdjP} !]_{C2}*

(GLOWBE-GB wlp_gb_genl_lsp/wlp_gb_g08 ##443361 Line: 33)

However, none of these make up a considerable proportion of the respective filler type combinations: *more*_{AdvP} × *less*_{AdvP} appears 19 times (19/275=6.91%) in GloWbE-GB, 24 times (24/342=7.02%) in stage V, and 18 times (18/285=6.32%) in stage III; *bigger*_{AdjP} × *better*_{AdjP} appears only 12 times in GloWbE-GB (12/340=3.53%). Again, this indicates that none of these combinations can account for the AdvP_{C1} × AdvP_{C2} and AdvP_{C1} × AdjP_{C2} association effects in the GloWbE data.

Table 4.74 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 17) (expected frequency ≥5, only attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
more_AdvP	more_AdvP	276	226	112	44.27	attraction	0.305	0.357	28.977	***
sooner_AdvP	better_AdjP	39	173	24	4.79	attraction	0.507	0.127	12.814	***
more_AdvP	less_AdvP	276	31	16	6.07	attraction	0.045	0.327	4.262	***
longer_AdvP	greater_AdjP	104	68	11	5.02	attraction	0.062	0.092	2.048	**

Table 4.75 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, BNC (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
more_AdvP	more_AdvP	369	274	143	49.54	attraction	0.309	0.394	44.265	***
sooner_AdvP	better_AdjP	129	355	86	22.44	attraction	0.526	0.217	37.648	***
greater_AdjP	greater_AdjP	87	201	36	8.57	attraction	0.329	0.151	14.860	***
higher_AdjP	greater_AdjP	115	201	33	11.32	attraction	0.200	0.120	8.531	***
more_AdvP	less_AdvP	369	54	19	9.76	attraction	0.031	0.176	2.741	**

Table 4.76 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, GloWbE-GB (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
sooner_AdvP	better_AdjP	108	293	77	20.47	attraction	0.563	0.238	34.646	***
more_AdvP	more_AdvP	410	282	161	74.79	attraction	0.286	0.374	33.464	***
less_AdvP	better_AdjP	35	293	16	6.63	attraction	0.274	0.039	3.634	***
more_AdvP	less_AdvP	410	36	17	9.55	attraction	0.025	0.212	2.253	**
bigger_AdjP	better_AdjP	34	293	12	6.44	attraction	0.167	0.023	1.762	*

Table 4.77 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, GloWbE stage V (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
more_AdvP	more_AdvP	484	342	181	85.10	attraction	0.264	0.340	34.906	***
sooner_AdvP	better_AdjP	106	294	60	16.02	attraction	0.439	0.176	23.880	***
more_AdvP	less_AdvP	484	59	24	14.68	attraction	0.026	0.163	2.312	***
older_AdjP	more_AdvP	46	342	14	8.09	attraction	0.132	0.021	1.660	**
more_AdvP	easier_AdjP	484	36	14	8.96	attraction	0.014	0.143	1.366	*

Table 4.78 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, GLOWBE stage IV (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
more_AdvP	more_AdvP	138	105	70	30.25	attraction	0.405	0.485	19.781	***

Table 4.79 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, GloWbE stage III (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
<i>more_AdvP</i>	<i>more_AdvP</i>	410	296	187	85.95	attraction	0.347	0.432	43.601	***
<i>sooner_AdvP</i>	<i>better_AdjP</i>	53	214	37	8.03	attraction	0.568	0.160	19.311	***
<i>earlier_AdvP</i>	<i>better_AdjP</i>	41	214	26	6.21	attraction	0.497	0.109	12.005	***
<i>more_AdvP</i>	<i>less_AdvP</i>	410	32	18	9.29	attraction	0.030	0.278	2.987	**

Table 4.80 Covarying-collexeme analysis of LEXICAL FILLER × FILLER TYPE interactions across C1 and C2, GLOWBE stage II (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
<i>more_AdvP</i>	<i>more_AdvP</i>	86	63	44	17.48	attraction	0.427	0.528	14.638	***

4.3.3 Deletion and truncation

Along with filler types, deletion and truncation phenomena were also investigated in COCA (4.3.3.1), BNC (4.3.3.2) and GloWbE (4.3.3.3). To this end, covarying-collexeme analyses and, in the case of GloWbE, a HCFA were carried out to detect cross-clausal associations and stage-specific configurations, with the aim of shedding further light on the meso-constructional network of English CCs.

4.3.3.1 Deletion and truncation in COCA and BNC

Tables 4.81 (COCA) and 4.82 (BNC) show the frequencies of deletion and truncation in C1 and C2, as indicated by Hoffmann et al. (2019: 19-20 (COCA) and 2020: 208 (BNC)). The frequencies are visualized as mosaic plots in Figures 4.50 (COCA) and 4.49 (BNC), and as was the case with deletion, they look very similar, indicating the same mutual associations in both corpora regarding deletion and truncation phenomena.

The covarying-collexeme analyses, whose results are presented in Tables¹² 4.83 (COCA, from Hoffmann et al. 2019) and 4.84 (BNC, from Hoffmann et al. 2020), confirm the strong preference for parallelism: In both corpora, a statistically significant preference could be determined only for the following symmetric patterns: Truncated_{C1} × Truncated_{C2} (4.38), Full clause_{C1} × Full clause_{C2} (4.39), BE-deleted mV_{C1} × BE-deleted mV_{C2} (4.40), and BE-retained mV_{C1} × BE-retained mV_{C2} (4.41). Additionally, BE-retained aux_{C1} × BE-retained aux_{C2} (4.42) turned out to be significantly associated in the BNC data.

(4.38) *Indeed [the more imaginative and fun]_{C1} [the better.]_{C2}*
(BNC W_pop_lore A0X)

(4.39) *[The more [I run,]_{Full clause}]_{C1} [the lighter [I feel]_{Full clause}]_{C2}*
(COCA wlp_fiction_awq/wlp_fic_2001 ##1034501 Line: 182)

(4.40) *[the blacker the berry [is]_{BE-deletion mV}]_{C1} [the sweeter the juice [is]_{BE-deletion mV}]_{C1}*
(COCA wlp_magazine_qri/wlp_mag_2000 ##2026229 Line: 4)

(4.41) *[the more safe drivers there [are]_{BE-retained mV}]_{C1} [the safer we all [are]_{BE-retained mV}]_{C2}*
(BNC W_pop_lore A70)

(4.42) *[The longer the problem [is]_{BE-retained aux} ignored,]_{C1} [the worse it [’s]_{BE-retained aux} going to get.]_{C2}*
(COCA wlp_magazine_qri/wlp_mag_1995 ##2032605 Line: 31)

Note that compared to filler type associations (section 4.3.2), the unidirectional cue validities are considerably higher regarding deletion and truncation. For example, in COCA a truncated C1 is a strong predictor ($\Delta PC2C1 = 0.692$) for truncation in C2 and vice versa ($\Delta PC1C2 = 0.498$), and the ΔP values are similarly high in BNC ($\Delta PC2C1 = 0.575$; $\Delta PC1C2 = 0.353$), suggesting strong entrenchment. The respective ΔP values are lower regarding the combinations Full clause_{C1} × Full clause_{C2} ($\Delta PC2C1 = 0.325$ (COCA)/ 0.342 (BNC); $\Delta PC1C2 = 0.318$ (COCA)/ 0.373 (BNC)) and BE-deleted mV_{C1} × BE-deleted mV_{C2} ($\Delta PC2C1 = 0.289$ (COCA)/ 0.371 (BNC); $\Delta PC1C2 = 0.399$ (COCA)/ 0.491 (BNC)), but still higher than those determined for filler type combinations. This indicates that generally, deletion/ truncation patterns are more deeply entrenched than filler type patterns.

12 To save space the tables shown here only include results which had an expected frequency of ≥ 5 .

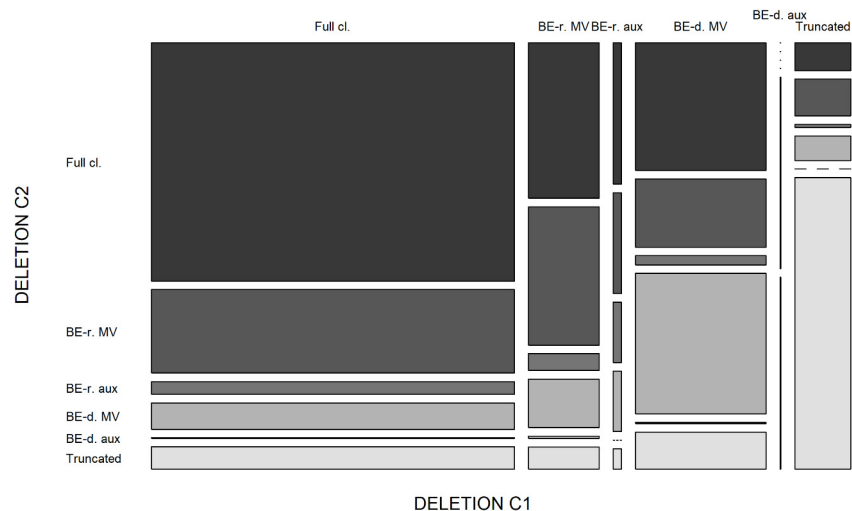


Figure 4.50 DELETION association across C1 and C2, COCA
(based on Hoffmann et al. 2019: 18)

Table 4.81 DELETION frequencies in C1 and C2, COCA
(Hoffmann et al. 2019)

DELETION	Tokens in C1	Tokens in C2
Full clause	813	683
BE-retained MV	158	303
BE-retained aux	19	43
BE-deleted MV	292	194
BE-deleted aux	2	4
Truncated	125	182

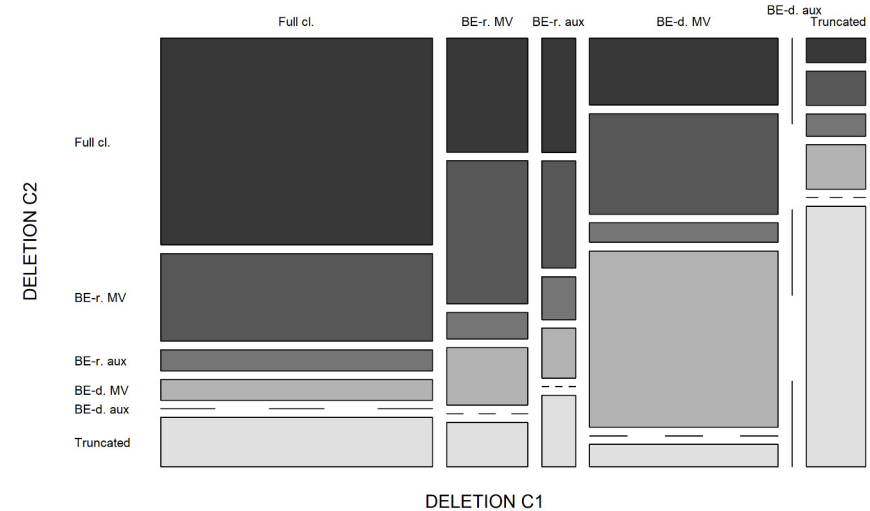


Figure 4.49 DELETION association across C1 and C2, BNC
(based on Hoffmann et al. 2020: 208)

Table 4.82 DELETION frequencies in C1 and C2, BNC
(Hoffmann et al. 2020)

DELETION	Tokens in C1	Tokens in C2
Full clause	875	695
BE-retained MV	261	500
BE-retained aux	108	120
BE-deleted MV	603	398
BE-deleted aux	12	7
Truncated	182	321

Table 4.83 Covarying-collexeme analysis of DELETION across C1 and C2, COCA (based on Hoffmann et al. 2019: 14) (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
Truncated	Truncated	125	182	95	16.15	attraction	0.692	0.498	68.297	***
Full clause	Full clause	813	683	506	394.09	attraction	0.325	0.318	33.553	***
BE-del. mV	BE-del. mV	292	194	107	40.20	attraction	0.289	0.399	30.274	***
BE-ret. mV	BE-ret. mV	158	303	57	33.98	attraction	0.164	0.097	5.263	***
Full clause	BE-ret. mV	813	303	177	174.83	attraction	0.006	0.009	0.383	n.s.
Full clause	BE-ret. aux	813	43	26	24.81	attraction	0.003	0.029	0.379	n.s.
Truncated	Full clause	125	683	9	60.59	repulsion	-0.453	-0.147	24.801	***
Full clause	Truncated	813	182	47	105.02	repulsion	-0.169	-0.366	20.021	***
Full clause	BE-del. mV	813	194	56	111.94	repulsion	-0.163	-0.334	17.665	***
BE-del. mV	Full clause	292	683	97	141.54	repulsion	-0.192	-0.127	8.588	***
Truncated	BE-ret. mV	125	303	12	26.88	repulsion	-0.131	-0.063	3.672	***
BE-ret. mV	Truncated	158	182	9	20.41	repulsion	-0.081	-0.072	2.819	**
Truncated	BE-del. mV	125	194	8	17.21	repulsion	-0.081	-0.055	2.253	**
BE-ret. mV	Full clause	158	683	64	76.59	repulsion	-0.09	-0.036	1.692	*
BE-del. mV	Truncated	292	182	28	37.72	repulsion	-0.042	-0.061	1.487	*
BE-del. mV	BE-ret. mV	292	303	52	62.79	repulsion	-0.047	-0.045	1.318	*
BE-ret. aux	Full clause	19	683	7	9.21	repulsion	-0.118	-0.006	0.667	n.s.
BE-del. mV	BE-ret. aux	292	43	7	8.91	repulsion	-0.008	-0.046	0.517	n.s.
BE-ret. mV	BE-del. mV	158	194	20	21.75	repulsion	-0.013	-0.01	0.412	n.s.

Table 4.84 Covarying-collexeme analysis of DELETION across C1 and C2, BNC (based on Hoffmann et al. 2019: 14) (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
BE-del. mV	BE-del. mV	603	398	275	117.59	attraction	0.371	0.491	75.632	***
Truncated	Truncated	182	321	124	28.62	attraction	0.575	0.353	64.411	***
Full clause	Full clause	875	695	469	297.95	attraction	0.342	0.373	58.365	***
BE-ret. mV	BE-ret. mV	261	500	97	63.94	attraction	0.145	0.088	6.177	***
BE-ret. aux	BE-ret. aux	108	120	12	6.35	attraction	0.055	0.050	1.661	*

(cont.)

Table 4.84 (cont.)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
BE-del. mV	BE-ret. mV	603	500	157	147.72	attraction	0.022	0.025	0.793	n.s.
BE-ret. aux	BE-ret. mV	108	500	30	26.46	attraction	0.035	0.009	0.621	n.s.
BE-ret. aux	Truncated	108	321	20	16.99	attraction	0.029	0.011	0.615	n.s.
BE-ret. mV	BE-ret. aux	261	120	18	15.35	attraction	0.012	0.024	0.576	n.s.
Full clause	BE-del. mV	875	398	47	170.63	repulsion	-0.247	-0.386	49.135	***
BE-del. mV	Full clause	603	695	105	205.33	repulsion	-0.236	-0.219	25.808	***
Truncated	Full clause	182	695	10	61.98	repulsion	-0.314	-0.113	21.175	***
BE-del. mV	Truncated	603	321	33	94.84	repulsion	-0.146	-0.229	18.371	***
Truncated	BE-ret. mV	182	500	15	44.59	repulsion	-0.178	-0.078	8.428	***
Full clause	Truncated	875	321	112	137.62	repulsion	-0.051	-0.095	3.026	***
Truncated	BE-del. mV	182	398	21	35.49	repulsion	-0.087	-0.045	2.698	**
BE-ret. mV	Truncated	261	321	29	41.05	repulsion	-0.053	-0.045	1.818	*
BE-ret. mV	BE-del. mV	261	398	39	50.90	repulsion	-0.052	-0.037	1.586	*
BE-ret. aux	BE-del. mV	108	398	14	21.06	repulsion	-0.069	-0.022	1.336	*
Full clause	BE-ret. mV	875	500	198	214.36	repulsion	-0.033	-0.043	1.307	n.s.
BE-ret. mV	Full clause	261	695	77	88.88	repulsion	-0.052	-0.026	1.262	n.s.
BE-del. mV	BE-ret. aux	603	120	30	35.45	repulsion	-0.013	-0.048	0.814	n.s.
BE-ret. aux	Full clause	108	695	32	36.78	repulsion	-0.047	-0.010	0.729	n.s.
Full clause	BE-ret. aux	875	120	48	51.45	repulsion	-0.007	-0.031	0.539	n.s.
Truncated	BE-ret. aux	182	120	10	10.70	repulsion	-0.004	-0.006	0.310	n.s.

4.3.3.2 Deletion and truncation in GloWbE

Table 4.85 shows the frequencies of deletion and truncation phenomena in the GloWbE data set. The mosaic plot (Figure 4.51) strongly resembles its COCA and BNC equivalents, with a preference for full clauses and BE-main verb retention and deletion.

Table 4.86 and Figure 4.53 show the frequencies of deletion and truncation in C1 in each GloWbE variety. Figure 4.52 shows the proportion, in per cent, of deletion and truncation in C1 in each variety. Likewise, Table 4.87 and Figure 4.55 show the frequencies of C2 deletion and truncation in each GloWbE variety. Figure 4.54 shows the proportion, in per cent, of C2 deletion and truncation in each variety. In general, these proportions appear to be similar across all varieties, with a preference for full clauses that is slightly higher in C1 (where their proportion is consistently over 50%, with NigE reaching almost 70%) than in C2 (where their proportion is between 40-50%). Furthermore, the charts show that in C1, the proportion of BE-retained mVs is higher than in C2, where the proportion of BE-retained mVs is higher

than in C1. Across all varieties, the other options – BE-retained auxiliaries, BE-deleted auxiliaries, and truncation – appear to play only a minor role, overall painting a picture that reflects the mosaic plots of COCA (Figure 4.50) and BNC (Figure 4.49).

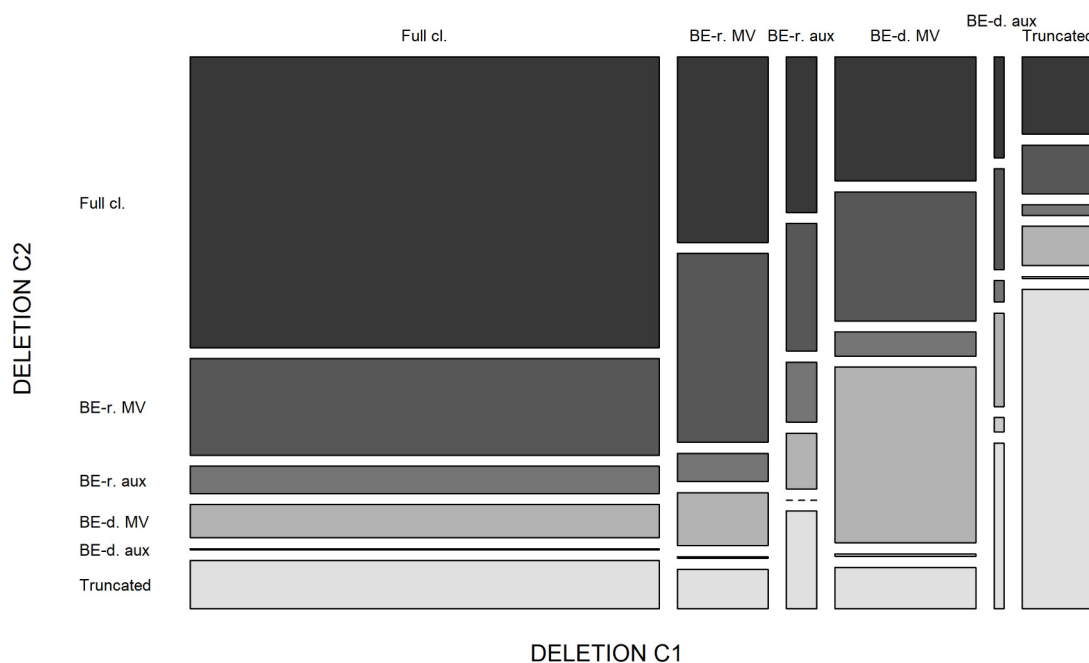


Figure 4.51 DELETION across C1 and C2, GloWbE

Table 4.85 DELETION frequencies in C1 and C2, GloWbE

FILLER TYPE	Tokens in C1	Tokens in C2
Full clause	3287	2570
BE-retained MV	635	1259
BE-retained aux	214	305
BE-deleted MV	989	715
BE-deleted aux	69	17
Truncated	521	849

To test for significant cross-clausal associations, the GloWbE data was subjected to a covarying-collexeme analysis. As was the case with filler types, a separate analysis was carried out for each DM stage. The results of the covarying-collexeme analyses are presented in Tables 4.88 (BrE), 4.89 (stage V), 4.90 (stage IV), 4.91 (stage III), and 4.92 (stage II).

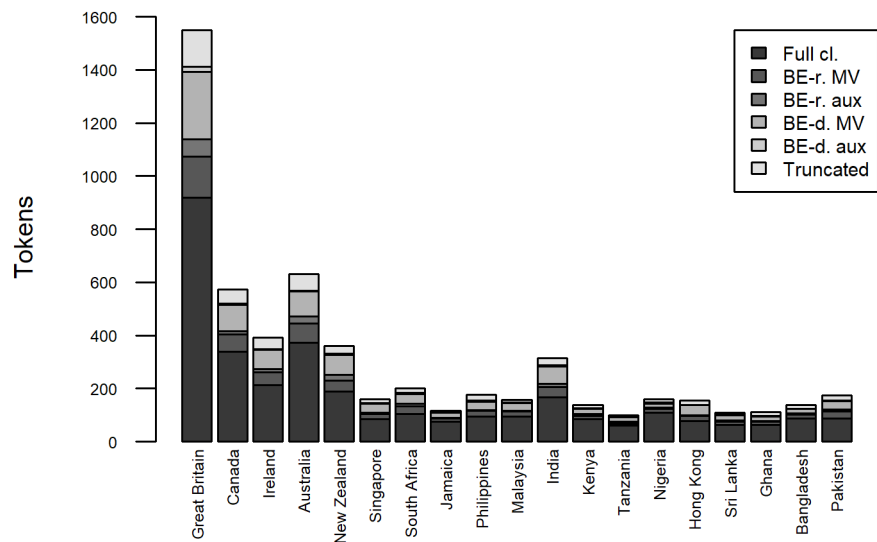


Figure 4.53 C1 DELETION tokens by GloWbE variety

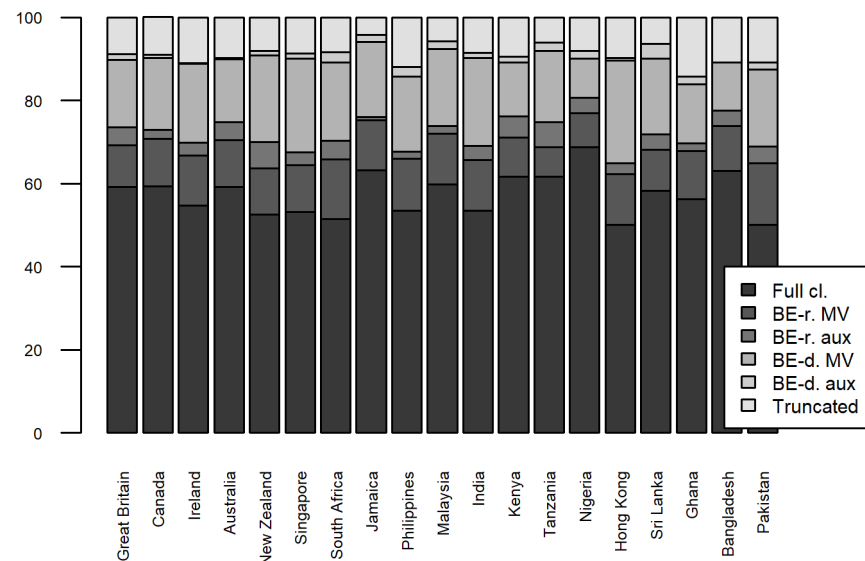


Figure 4.52 C1 DELETION tokens by GloWbE variety, percentages

Table 4.86 C1 DELETION tokens by GloWbE variety, grouped according to DM stage

FILLER TYPE C1	Stage V					Stage IV			Stage III								Stage II		
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
Full cl.	919	339	214	373	189	85	104	74	94	94	168	85	61	110	77	64	63	87	87
BE-r. mV	154	66	47	71	40	18	29	14	22	19	38	13	7	13	19	11	13	15	26
BE-r. aux	67	12	12	27	23	5	9	1	3	3	11	7	6	6	4	4	2	5	7
BE-d. mV	252	99	74	95	75	36	38	21	32	29	66	18	17	15	38	20	16	16	32
BE-d. aux	21	4	1	2	4	2	5	2	4	3	4	2	2	3	1	4	2	0	3
Truncated	138	52	43	62	29	14	17	5	21	9	27	13	6	13	15	7	16	15	19
Total	1551	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174

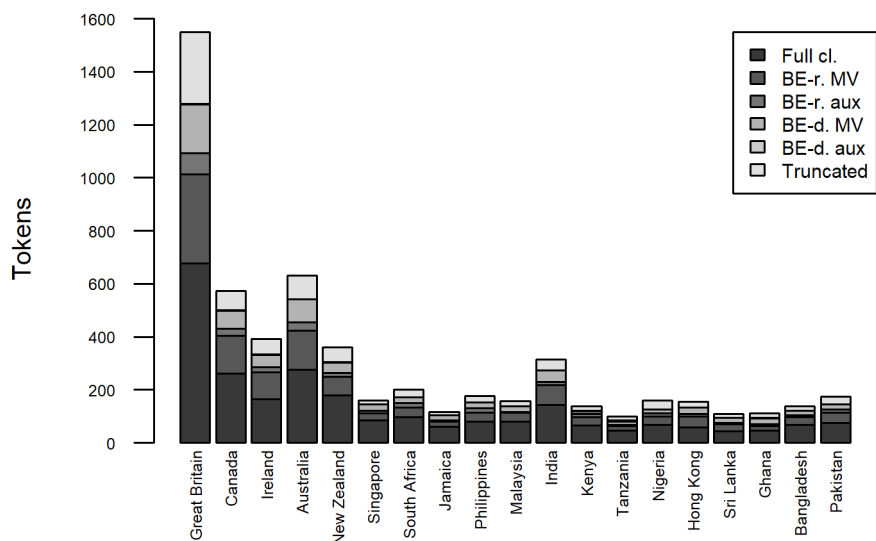


Figure 4.55 C2 DELETION tokens by GloWbE variety

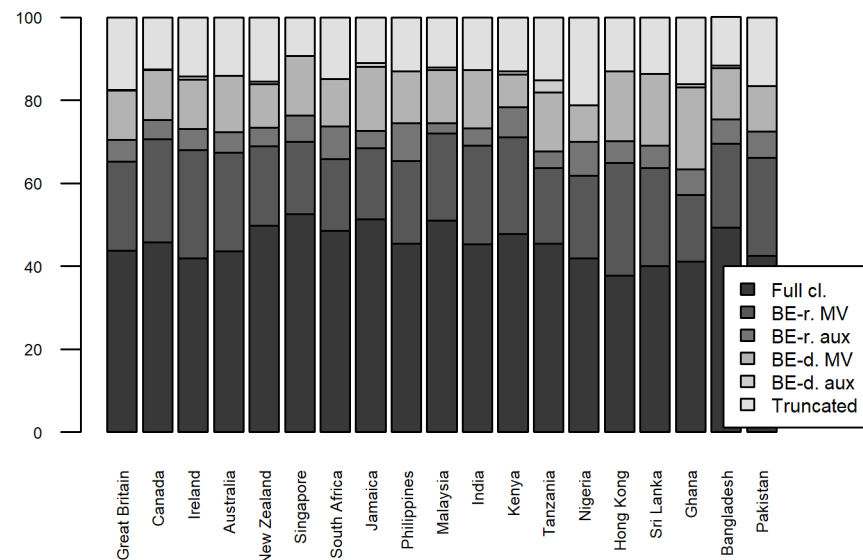


Figure 4.54 C2 DELETION tokens by GloWbE variety, percentages

Table 4.87 C2 DELETION tokens by GloWbE variety, grouped according to DM stage

FILLER TYPE C2	Stage V					Stage IV			Stage III								Stage II		
	BrE	CanE	IrE	AuE	NZE	SingE	SAfE	JamE	PhilE	MalE	IndE	KenE	TanzE	NigE	HKE	SriLE	GhE	BangE	PakE
Full cl.	678	262	164	275	179	84	98	60	80	80	142	66	45	67	58	44	46	68	74
BE-r. mV	334	142	102	149	69	28	35	20	35	33	75	32	18	32	42	26	18	28	41
BE-r. aux	81	26	20	31	16	10	16	5	16	4	13	10	4	13	8	6	7	8	11
BE-d. mV	184	69	46	86	38	23	23	18	22	20	44	11	14	14	26	19	22	17	19
BE-d. aux	3	1	3	0	2	0	0	1	0	1	0	1	3	0	0	0	1	1	0
Truncated	271	72	56	89	56	15	30	13	23	19	40	18	15	34	20	15	18	16	29
Total	1551	572	391	630	360	160	202	117	176	157	314	138	99	160	154	110	112	138	174

Table 4.88 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE-GB (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
Truncated	Truncated	138	271	99	24.11	attraction	0.596	0.335	50.137	***
Full clause	Full clause	919	678	520	401.73	attraction	0.316	0.310	35.231	***
BE-del. mV	BE-del. mV	252	184	85	29.90	attraction	0.261	0.340	24.441	***
BE-ret. mV	BE-ret. mV	154	334	63	33.16	attraction	0.215	0.114	8.157	***
BE-del. mV	BE-ret. mV	252	334	63	54.27	attraction	0.041	0.033	1.069	n.s.
BE-ret. aux	Truncated	67	271	16	11.71	attraction	0.067	0.019	0.964	n.s.
BE-ret. aux	BE-ret. mV	67	334	18	14.43	attraction	0.056	0.014	0.759	n.s.
BE-del. mV	BE-ret. aux	252	81	16	13.16	attraction	0.013	0.037	0.638	n.s.
BE-ret. aux	BE-del. mV	67	184	8	7.95	attraction	0.001	0.000	0.259	n.s.
Truncated	Full clause	138	678	15	60.33	repulsion	-0.361	-0.119	17.649	***
Full clause	Truncated	919	271	110	160.57	repulsion	-0.135	-0.226	11.153	***
Full clause	BE-del. mV	919	184	67	109.02	repulsion	-0.112	-0.259	10.618	***
BE-del. mV	Full clause	252	678	65	110.16	repulsion	-0.214	-0.118	9.931	***
Truncated	BE-ret. mV	138	334	11	29.72	repulsion	-0.149	-0.071	5.113	***
BE-del. mV	Truncated	252	271	22	44.03	repulsion	-0.104	-0.099	4.794	***
BE-ret. aux	Full clause	67	678	17	29.29	repulsion	-0.192	-0.032	2.924	**
Full clause	BE-ret. mV	919	334	174	197.90	repulsion	-0.064	-0.091	2.769	**
BE-ret. mV	Truncated	154	271	16	26.91	repulsion	-0.079	-0.049	2.128	**
BE-ret. mV	BE-del. mV	154	184	10	18.27	repulsion	-0.060	-0.051	1.801	*
BE-del. aux	Full clause	21	678	4	9.18	repulsion	-0.250	-0.014	1.788	*
Truncated	BE-ret. aux	138	81	2	7.21	repulsion	-0.041	-0.068	1.728	*
BE-ret. mV	Full clause	154	678	57	67.32	repulsion	-0.074	-0.027	1.340	*
Truncated	BE-del. mV	138	184	11	16.37	repulsion	-0.043	-0.033	1.071	n.s.
Full clause	BE-ret. aux	919	81	47	47.99	repulsion	-0.003	-0.013	0.345	n.s.
BE-ret. mV	BE-ret. aux	154	81	8	8.04	repulsion	0.000	-0.001	0.232	n.s.

Table 4.89 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage V (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
Truncated	Truncated	186	273	112	26	attraction	0.511	0.366	55.807	***
Full clause	Full clause	1115	880	650	502.41	attraction	0.308	0.305	42.192	***
BE-del. mV	BE-del. mV	343	239	125	41.98	attraction	0.294	0.396	39.837	***
BE-ret. mV	BE-ret. mV	224	462	86	52.99	attraction	0.166	0.094	6.981	***
BE-del. mV	BE-ret. mV	343	462	100	81.14	attraction	0.067	0.053	2.244	**
Full clause	BE-ret. aux	1115	93	60	53.09	attraction	0.014	0.078	1.077	n.s.
BE-ret. aux	Truncated	74	273	13	10.34	attraction	0.037	0.011	0.647	n.s.
Full clause	BE-del. mV	1115	239	63	136.45	repulsion	-0.154	-0.350	24.045	***
BE-del. mV	Full clause	343	880	77	154.55	repulsion	-0.274	-0.160	20.880	***
Truncated	Full clause	186	880	31	83.81	repulsion	-0.314	-0.109	17.015	***
Full clause	Truncated	1115	273	110	155.86	repulsion	-0.096	-0.195	8.873	***
BE-del. mV	Truncated	343	273	22	47.95	repulsion	-0.092	-0.110	5.881	***
Truncated	BE-ret. mV	186	462	23	44	repulsion	-0.125	-0.060	4.391	***
BE-ret. mV	Truncated	224	273	14	31.31	repulsion	-0.087	-0.074	4.013	***
Full clause	BE-ret. mV	1115	462	231	263.76	repulsion	-0.068	-0.093	3.569	***
Truncated	BE-del. mV	186	239	15	22.76	repulsion	-0.046	-0.037	1.410	*
Truncated	BE-ret. aux	186	93	4	8.86	repulsion	-0.029	-0.055	1.322	*
BE-ret. mV	Full clause	224	880	89	100.93	repulsion	-0.060	-0.025	1.293	n.s.
BE-ret. aux	BE-del. mV	74	239	6	9.06	repulsion	-0.043	-0.015	0.747	n.s.
BE-ret. mV	BE-ret. aux	224	93	8	10.67	repulsion	-0.013	-0.030	0.618	n.s.
BE-del. mV	BE-ret. aux	343	93	15	16.33	repulsion	-0.005	-0.015	0.379	n.s.
BE-ret. aux	Full clause	74	880	32	33.34	repulsion	-0.019	-0.003	0.375	n.s.
BE-ret. aux	BE-ret. mV	74	462	17	17.5	repulsion	-0.007	-0.001	0.294	n.s.
BE-ret. mV	BE-del. mV	224	239	27	27.41	repulsion	-0.002	-0.002	0.287	n.s.

Table 4.90 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage IV (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
Full clause	Full clause	263	242	178	132.87	attraction	0.381	0.377	16.275	***
BE-del. mV	BE-del. mV	95	64	30	12.69	attraction	0.227	0.312	7.010	***
BE-ret. mV	BE-ret. mV	61	83	20	10.57	attraction	0.177	0.137	2.924	**
BE-del. mV	BE-ret. mV	95	83	24	16.46	attraction	0.099	0.110	1.721	*
BE-ret. mV	Truncated	61	58	9	7.39	attraction	0.030	0.032	0.510	n.s.
Full clause	Truncated	263	58	14	31.85	repulsion	-0.150	-0.350	6.391	***
BE-del. mV	Full clause	95	242	28	48.00	repulsion	-0.263	-0.167	5.499	***
Full clause	BE-del. mV	263	64	21	35.14	repulsion	-0.119	-0.255	3.944	***
Truncated	Full clause	36	242	8	18.19	repulsion	-0.306	-0.085	3.518	***
BE-ret. mV	Full clause	61	242	19	30.82	repulsion	-0.222	-0.099	3.057	***
Full clause	BE-ret. mV	263	83	35	45.57	repulsion	-0.089	-0.154	2.133	**
BE-ret. aux	Full clause	15	242	4	7.58	repulsion	-0.246	-0.030	1.285	n.s.
Truncated	BE-ret. mV	36	83	3	6.24	repulsion	-0.097	-0.047	1.005	n.s.
BE-del. mV	BE-ret. aux	95	31	3	6.15	repulsion	-0.041	-0.109	0.986	n.s.
BE-ret. mV	BE-del. mV	61	64	5	8.15	repulsion	-0.059	-0.057	0.851	n.s.
Full clause	BE-ret. aux	263	31	15	17.02	repulsion	-0.017	-0.070	0.546	n.s.
BE-del. mV	Truncated	95	58	10	11.50	repulsion	-0.020	-0.029	0.430	n.s.

Table 4.91 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage III (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
Truncated	Truncated	127	202	81	18.07	attraction	0.544	0.363	42.653	***
Full clause	Full clause	816	628	474	360.88	attraction	0.326	0.323	34.619	***
BE-del. mV	BE-del. mV	251	192	86	33.94	attraction	0.252	0.314	20.933	***
BE-ret. mV	BE-ret. mV	155	311	56	33.95	attraction	0.160	0.091	4.920	***
BE-ret. mV	BE-ret. aux	155	81	13	8.84	attraction	0.030	0.054	1.027	n.s.
BE-del. mV	BE-ret. mV	251	311	63	54.97	attraction	0.039	0.033	0.984	n.s.
BE-ret. aux	BE-ret. mV	46	311	13	10.07	attraction	0.066	0.012	0.727	n.s.
BE-ret. aux	Truncated	46	202	9	6.54	attraction	0.055	0.014	0.707	n.s.

(cont.)

Table 4.91 (cont.)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
BE-ret. aux	BE-del. mV	46	192	7	6.22	attraction	0.018	0.005	0.365	n.s.
BE-ret. mV	BE-del. mV	155	192	22	20.96	attraction	0.008	0.006	0.359	n.s.
Full clause	BE-del. mV	816	192	60	110.33	repulsion	-0.145	-0.303	14.530	***
Full clause	Truncated	816	202	69	116.08	repulsion	-0.136	-0.272	12.302	***
Truncated	Full clause	127	628	21	56.17	repulsion	-0.304	-0.100	11.321	***
BE-del. mV	Full clause	251	628	65	111.01	repulsion	-0.223	-0.131	10.433	***
BE-del. aux	Full clause	25	628	2	11.06	repulsion	-0.369	-0.026	4.068	***
Truncated	BE-ret. mV	127	311	12	27.82	repulsion	-0.137	-0.065	3.986	***
BE-ret. mV	Truncated	155	202	8	22.05	repulsion	-0.102	-0.081	3.851	***
BE-ret. aux	Full clause	46	628	11	20.34	repulsion	-0.210	-0.027	2.508	**
Truncated	BE-ret. aux	127	81	1	7.24	repulsion	-0.054	-0.082	2.420	**
BE-ret. mV	Full clause	155	628	55	68.55	repulsion	-0.098	-0.039	1.913	*
BE-del. mV	Truncated	251	202	25	35.71	repulsion	-0.052	-0.062	1.737	*
Full clause	BE-ret. mV	816	311	164	178.72	repulsion	-0.042	-0.061	1.484	*
Truncated	BE-del. mV	127	192	11	17.17	repulsion	-0.053	-0.037	1.251	n.s.
BE-del. aux	BE-ret. mV	25	311	3	5.47	repulsion	-0.101	-0.010	0.774	n.s.
BE-del. mV	BE-ret. aux	251	81	12	14.32	repulsion	-0.011	-0.030	0.523	n.s.
Full clause	BE-ret. aux	816	81	46	46.55	repulsion	-0.002	-0.007	0.307	n.s.

Table 4.92 Covarying-collexeme analysis of DELETION across C1 and C2, GloWbE stage II (expected frequency ≥ 5)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
BE-del. mV	BE-del. mV	48	36	24	5.54	attraction	0.455	0.580	13.509	***
Full clause	Full clause	174	142	102	79.19	attraction	0.296	0.295	6.899	***
BE-ret. mV	BE-ret. mV	41	69	17	9.07	attraction	0.223	0.148	2.659	**
Full clause	BE-ret. aux	174	19	13	10.60	attraction	0.031	0.135	0.738	n.s.
Full clause	BE-del. mV	174	36	8	20.08	repulsion	-0.157	-0.379	4.820	***
Full clause	Truncated	174	45	14	25.10	repulsion	-0.144	-0.288	3.538	***
Truncated	Full clause	34	142	6	15.47	repulsion	-0.313	-0.122	3.466	***

(cont.)

Table 4.92 (cont.)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP (C2C1)	ΔP (C1C2)	Coll. strength	Sign.
BE-del. mV	Full clause	48	142	12	21.85	repulsion	-0.242	-0.127	2.874	**
Truncated	BE-ret. mV	34	69	2	7.52	repulsion	-0.182	-0.103	2.078	**
BE-del. mV	Truncated	48	45	3	6.92	repulsion	-0.097	-0.102	1.259	n.s.
BE-del. mV	BE-ret. mV	48	69	7	10.62	repulsion	-0.089	-0.067	0.932	n.s.
BE-ret. mV	Truncated	41	45	3	5.91	repulsion	-0.082	-0.076	0.917	n.s.
BE-ret. aux	Full clause	12	142	3	5.46	repulsion	-0.213	-0.032	0.913	n.s.
Full clause	BE-ret. mV	174	69	36	38.48	repulsion	-0.032	-0.046	0.534	n.s.
BE-ret. mV	Full clause	41	142	17	18.66	repulsion	-0.047	-0.021	0.457	n.s.

As the covarying-collexeme analysis results tables and the overview, provided in Table 4.93 show, there is a strong preference for parallelism in CCs across all DM stages, with almost exactly the same combinations as in COCA and BNC emerging as statistically significant: Truncated_{C1} × Truncated_{C2} (4.43) in BrE and stages V and III, Full clause_{C1} × Full clause_{C2} (4.44) in BrE and all DM stages, BE-deleted mV_{C1} × BE-deleted mV_{C2} (4.45) in BrE and all DM stages, and BE-retained mV_{C1} × BE-retained mV_{C2} (4.46) in BrE and all DM stages.

(4.43) *Join a strange society, [the stranger]_{C1} [the better]_{C2}.*

(GLOWBE-GB wlp_gb_genl_lsp/wlp_gb_g10 ##371378 Line: 22)

(4.44) *According to him: [“The more [you tell,] Full clause]C1 [the more [you sell.”] Full clause]C2*

(GLOWBE-KE wlp_ke_aua/wlp_ke_g01 ##1289533 Line: 1016)

(4.45) *And, [the more efficient the unit [is] BE-deletion mV,]C1*

[the lower the operating costs [are] BE-deletion mV.]C2

(GLOWBE-IN wlp_in_ksi/wlp_in_g01 ##845320 Line: 10)

(4.46) *[The more simple they [are,] BE-retained mV]C1 [the easier it [is] BE-retained mV.]C2*

(GLOWBE-GB wlp_gb_blog_akq/wlp_gb_b07 ##3116993 Line: 22)

While these results thus make a strong case for symmetry (and therefore parataxis in CCs) across DM stages, the GloWbE data also contained one significantly associated pattern that stands out as asymmetric: BE-deleted mV_{C1} × BE-retained mV_{C2} (4.47 and 4.48), which emerged as significantly associated in stages V (collostructional strength: 2.244**) and IV (collostructional strength: 1.721*).

(4.47) *As a rule [the more circular an island [is] BE-deletion mV]C1*

[the more likely it [is] BE-retained mV to be artificial.]C2

(GLOWBE-IE wlp_ie_ksu/wlp_ie_g03 ##1611555 Line: 14)

(4.48) *[The longer the absence [is] BE-deletion mV]C1*

[the easier it [is] BE-retained mV for fans to forget you.]

(GLOWBE-SG wlp_sg_jsu/wlp_sg_g01 ##1040935 Line: 25)

Table 4.93 All significant DELETION patterns and in which corpora they were found, with collostructional strength values (shading according to strength)

DELETION pattern	COCA	BNC	GloWbE-GB	GloWbE V	GloWbE IV	GloWbE III	GloWbE II
Truncated × Truncated	68.297***	64.411***	50.137***	55.807***		42.653***	
Full clause × Full clause	33.553***	58.365***	35.231***	42.192***	16.275***	34.619***	6.899***
BE-del. mV × BE-del. mV	30.274***	75.632***	24.441***	39.837***	7.010***	20.933***	13.509***
BE-ret. mV × BE-ret. mV	5.263***	6.177***	8.157***	6.981***	2.924**	4.920***	2.659**
BE-ret. aux × BE-ret. aux		1.661*					
BE-del. mV × BE-ret. mV				2.244**	1.721*		

Note, however, that in both stages the unidirectional cue validities for BE-deleted $mV_{C1} \times$ BE-retained mV_{C2} were considerably lower (i.e., with one exception, $\Delta P < 0.1$) than the other associations, indicating a lesser degree of entrenchment:

- stage V: $\Delta PC2C1 = 0.067$; $\Delta PC1C2 = 0.053$,
- stage IV: $\Delta PC2C1 = 0.099$; $\Delta PC1C2 = 0.110$,

Looking at the unidirectional cue validities, the general tendency for the strong entrenchment of deletion and truncation patterns that was determined in the COCA and BNC data can be further confirmed in the GloWbE data: The ΔP values are generally higher than for filler types. Truncation in C1 turns out to be a particularly strong predictor for truncation in C2 ($\Delta PC2C1 = 0.596$ in GloWbE-GB, 0.511 in stage V, and 0.544 in stage III), and a full clause in C1 is a strong predictor for a full clause in C2, and vice versa, with $\Delta PC2C1$ and $\Delta PC1C2$ values of ≥ 0.3 in all data sets. Interestingly, in all data sets (with the exception of stage II, where this combination did not emerge as significant), the $\Delta PC1C2$ values of BE-deleted $mV_{C1} \times$ BE-deleted mV_{C2} were stronger than the respective $\Delta PC2C1$ values, indicating that BE-deletion in C2 is a stronger predictor for BE-deletion in C1 than vice versa:

- GB: $\Delta PC2C1 = 0.261$; $\Delta PC1C2 = 0.340$,
- stage V: $\Delta PC2C1 = 0.294$; $\Delta PC1C2 = 0.396$,
- stage IV: $\Delta PC2C1 = 0.227$; $\Delta PC1C2 = 0.312$,
- stage III: $\Delta PC2C1 = 0.252$; $\Delta PC1C2 = 0.314$.

In addition to the covarying-collexeme analyses, the GloWbE data was also subjected to a HCFA in order to test for stage-specific effects. The results, presented in Table 4.94, show the following four configurations to be statistically significantly associated:

- Full clause_{C1} \times Full clause_{C2} in BrE and stages V, IV, and III;
- BE-deleted $mV_{C1} \times$ BE-deleted mV_{C2} in BrE and stages V, IV, III, and II;
- Truncated_{C1} \times Truncated_{C2} in BrE and stages V, IV, and III;
- BE-retained $mV_{C1} \times$ BE-retained mV_{C2} in BrE and stage V.

As was the case with filler types, the HCFA revealed only types that were symmetric, providing more evidence in favor of a paratactic analysis of CCs across all DM stages. This is further underscored by the fact that all anti-types were asymmetric configurations. Furthermore, the types that turned up as significant in the HCFA mirror those determined by the covarying-collexeme analyses, again demonstrating the reliability of the two tests.

In summary, it can thus be said that with the exception of one pattern – BE-deleted $mV_{C1} \times$ BE-retained mV_{C2} (see above) – the results of the covarying-collexeme analyses in all corpora and across all DM stages of GloWbE, as well as the HCFA of the GloWbE data have revealed exclusively symmetric patterns, which makes a compelling case for a paratactic analysis of English CCs in the standard varieties as well as PCEs.

Table 4.94 HCFA of DELETION, GloWbE (expected frequency ≥ 5 , only significant results)

DM stage	DELETION C1	DELETION C2	Freq.	Exp.	Cont. chisq.	Obs-exp	p-value	DEC.	Q
V	Full clause	Full clause	650	505.13	41.549	>	<0.001 ***		0.028
GB	Full clause	Full clause	520	401.16	35.209	>	<0.001 ***		0.022
III	Full clause	Full clause	474	367.27	31.014	>	<0.001 ***		0.020
V	BE-deleted mV	BE-deleted mV	125	42.28	161.812	>	<0.001 ***		0.015
V	Truncated	Truncated	112	26.45	276.714	>	<0.001 ***		0.015
GB	Truncated	Truncated	99	21.01	289.606	>	<0.001 ***		0.014
V	Full clause	BE-deleted mV	63	140.53	42.775	<	<0.001 ***		0.014
V	BE-deleted mV	Full clause	77	151.98	36.995	<	<0.001 ***		0.013
III	Truncated	Truncated	81	19.23	198.399	>	<0.001 ***		0.011
GB	BE-deleted mV	Full clause	65	120.7	25.704	<	<0.001 ***		0.010
III	BE-deleted mV	BE-deleted mV	86	30.74	99.313	>	<0.001 ***		0.010
IV	Full clause	Full clause	178	123.89	23.633	>	<0.001 ***		0.010
V	Full clause	Truncated	110	166.87	19.381	<	<0.001 ***		0.010
GB	BE-deleted mV	BE-deleted mV	85	33.58	78.737	>	<0.001 ***		0.009
GB	Truncated	Full clause	15	63.58	37.123	<	<0.001 ***		0.009
III	Full clause	Truncated	69	121.33	22.569	<	<0.001 ***		0.009
V	Truncated	Full clause	31	80.06	30.067	<	<0.001 ***		0.009
GB	Full clause	BE-deleted mV	67	111.61	17.828	<	<0.001 ***		0.008
III	Full clause	BE-deleted mV	60	102.18	17.411	<	0.001 ***		0.008

(cont.)

Table 4.93 (cont.)

DM stage	DELETION C1	DELETION C2	Freq.	Exp.	Cont. chisq.	Obs-exp	p-value	DEC.	Q
III	BE-deleted mV	Full clause	65	110.51	18.739	<	<0.001 ***		0.008
III	Truncated	Full clause	21	58.21	23.789	<	<0.001 ***		0.007
V	BE-retained mV	BE-retained mV	86	47.8	30.518	>	<0.001 ***		0.007
IV	Full clause	BE-retained mV	35	60.69	10.876	<	0.035 *		0.005
IV	Full clause	Truncated	14	40.93	17.716	<	<0.001 ***		0.005
V	BE-deleted mV	Truncated	22	50.21	15.848	<	0.001 ***		0.005
GB	BE-retained mV	BE-retained mV	63	37.96	16.509	>	0.018 *		0.004
GB	Truncated	BE-retained mV	11	31.15	13.034	<	0.004 **		0.004
II	BE-deleted mV	BE-deleted mV	24	6.76	44.025	>	<0.001 ***		0.003
III	BE-retained mV	Truncated	8	23.44	10.169	<	0.032 *		0.003
IV	BE-deleted mV	BE-deleted mV	30	10.37	37.154	>	<0.001 ***		0.003
V	BE-retained MV	Truncated	14	32.24	10.317	<	0.037 *		0.003
IV	Truncated	Truncated	20	6.49	28.148	>	0.002 **		0.002
V	BE-deleted aux	Full clause	1	10.6	8.698	<	0.042 *		0.002

4.3.4 Deletion/truncation and filler type interactions

Following Hoffmann et al.'s (2019; 2020) methodology, the factors DELETION C1 and FILLER TYPE C1, as well as DELETION C2 and FILLER TYPE C2 were collapsed and subjected to covarying-collexeme analyses to obtain a more detailed picture of the meso-constructional network, more specifically, its granddaughter nodes¹³. The results are presented in Tables 4.95 to 4.101. They show that in total, 17 different significant associations could be determined, of which six have identical factor combinations in C1 and C2. Table 4.102, which provides an overview, shows that in all corpora and across all DM stages, there is a tendency towards such symmetric structures. In other words, there is a preference for structures that are identical in C1 and C2, despite the fact that “FILLER TYPE as well as DELETION should in principle be able to vary independently of each other” (Hoffmann et al. 2020: 210). In this context it is noteworthy that of the 11 remaining associations, in nine at least one factor is identical in C1 and C2. In the words of Hoffmann et al., these findings show that “neither of these two variables is exclusively associated with a particular feature of the other variable”, even though “the iconic parallel semantics seem to have supported the entrenchment of various parallel structures across C1 and C2” (2020: 210). Also note that there is a tendency for those patterns which are only partly symmetric or asymmetric to be less deeply entrenched, as the lower collostructional strengths (reflected by lighter shading) indicate.

The patterns Full clause_AdvP × Full clause_AdvP (collostructional strength >11***) (4.49), BE-retained mV_AdjP × BE-retained mV_AdjP (collostructional strength >2**) (4.50), and Full clause_NP × Full clause_NP (collostructional strength >2**) (4.51) were found to be significant in all corpora, indicating that these patterns are strongly entrenched prototypes of the CC in English.

(4.49) *Anything goes, and [the [[more]_{AdvP} he goes down-market]_{Full clause}]_{C1}*

[the [[more]_{AdvP} they love it.]_{Full clause}]_{C2}

(BNC W_religion B1J)

(4.50) *[The [smarter]_{AdjP} the press [are]_{BE-retained mV}]_{C1}*

[the [better off]_{AdjP} society [is.]_{BE-retained mV}]_{C2}

(GLOWBE-NG wlp_ng_kdt/wlp_ng_b01 ##3606837 Line: 12)

(4.51) *[The [[more body fat]_{NP} a woman has]_{Full clause}]_{C1}*

[the [[more oestrogen]_{NP} those fat cells can produce.]_{Full clause}]_{C2}

(GLOWBE-GB wlp_gb_genl_lsp/wlp_gb_g12 ##116695 Line: 24)

Confirming Hoffmann et al.'s COCA study results, of these three patterns, “NP-NP and AdvP-AdvP filler pairs turn out to be only significantly associated with FULL CLAUSE-FULL CLAUSE structures [...]”, which indicates that it is “only this subset of FULL CLAUSES for which these granddaughter node associations seem to play a role” (2019: 22).

¹³ The term ‘granddaughter node’ is used to indicate that it refers to the meso-constructional level below “the two daughter nodes (C1 and C2)” (Hoffmann et al. 2019: 7).

Table 4.95 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 23) (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Truncated_AdjP	Truncated_AdjP	58	155	48	6.38	attraction	0.748	0.302	38.836	***
BE-deleted mV_AdjP	BE-deleted mV_AdjP	282	185	104	37.03	attraction	0.297	0.417	31.902	***
Full clause_AdvP	Full clause_AdvP	570	410	245	165.86	attraction	0.233	0.272	20.366	***
BE-retained mV_AdjP	BE-retained mV_AdjP	113	242	37	19.41	attraction	0.169	0.088	4.736	***
Full clause_AdjP	Full clause_AdjP	95	155	22	10.45	attraction	0.130	0.084	3.486	***
Full clause_AdjP	Full clause_NP	95	113	15	7.62	attraction	0.083	0.071	2.183	**
Full clause_NP	Full clause_NP	146	113	20	11.71	attraction	0.063	0.080	2.043	**
Full clause_AdvP	Full clause_AdjP	570	155	74	62.70	attraction	0.033	0.082	1.507	*
Full clause_AdvP	BE-retained mV_AdjP	570	242	110	97.90	attraction	0.036	0.060	1.319	*

Table 4.96 Covarying-collexeme analysis of DELETION × FILLER TYPE¹⁴ interactions across C1 and C2, BNC (from Hoffmann et al. 2020: 211) (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
BE-deleted mV_AdjP	BE-deleted mV_AdjP	590	388	264	112.16	attraction	0.362	0.483	72.189	***
Truncated_AdjP	Truncated_AdjP	62	296	54	8.99	attraction	0.749	0.178	38.128	***
Full clause_AdvP	Full clause_AdvP	612	348	196	104.35	attraction	0.214	0.318	29.015	***
Truncated_AdvP	Truncated_AdjP	39	296	30	5.66	attraction	0.636	0.096	17.934	***
Full clause_AdvP	Full clause_AdjP	612	230	110	68.97	attraction	0.096	0.201	8.966	***
Truncated_NP	Truncated_AdjP	78	296	32	11.31	attraction	0.276	0.082	8.334	***
BE-retained mV_AdjP	BE-retained mV_AdjP	202	414	70	40.97	attraction	0.159	0.088	6.472	***
Full clause_AdjP	Full clause_AdjP	139	230	30	15.66	attraction	0.111	0.070	3.692	***
BE-retained_aux_AdvP	Truncated_AdjP	76	296	20	11.02	attraction	0.123	0.035	2.368	**
Full clause_NP	Full clause_NP	116	108	13	6.14	attraction	0.063	0.067	2.169	**
Full clause_AdvP	Full clause_NP	612	108	44	32.38	attraction	0.027	0.114	2.027	**
Full clause_NP	BE-retained mV_AdjP	116	414	34	23.53	attraction	0.096	0.032	1.960	*
BE-deleted mV_AdjP	BE-retained mV_AdjP	590	414	138	119.68	attraction	0.044	0.056	1.799	*
Full clause_AdjP	Full clause_NP	139	108	13	7.36	attraction	0.044	0.055	1.545	*

¹⁴ The labels have been inverted to facilitate comparison with the other tables (e.g. where in the original source, AdjP_BE-deleted_mV was indicated, this was changed to BE-deleted_mV_AdjP).

Table 4.97 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, GloWbE-GB (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Truncated_AdjP	Truncated_AdjP	44	253	39	7.18	attraction	0.744	0.150	26.132	***
BE-deleted MV_AdjP	BE-deleted MV_AdjP	237	176	80	26.89	attraction	0.264	0.340	24.301	***
Full clause_AdvP	Full clause_AdvP	648	330	214	137.87	attraction	0.202	0.293	20.872	***
Truncated_AdvP	Truncated_AdjP	34	253	29	5.55	attraction	0.705	0.111	18.337	***
BE-retained MV_AdjP	BE-retained MV_AdjP	113	280	43	20.40	attraction	0.216	0.098	6.874	***
Full clause_AdvP	Full clause_AdjP	648	196	110	81.89	attraction	0.075	0.164	4.968	***
Truncated_NP	Truncated_AdjP	57	253	22	9.30	attraction	0.231	0.060	4.508	***
Full clause_NP	Full clause_NP	167	145	29	15.61	attraction	0.090	0.102	3.409	***
Full clause_AdjP	Full clause_AdjP	95	196	20	12.01	attraction	0.090	0.047	1.927	*
Full clause_AdjP	Full clause_NP	95	145	16	8.88	attraction	0.080	0.054	1.917	*
BE-retained aux_AdvP	Truncated_AdjP	56	253	15	9.13	attraction	0.109	0.028	1.533	*

Table 4.98 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, GloWbE stage V (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
BE-deleted MV_AdjP	BE-deleted MV_AdjP	334	233	121	39.85	attraction	0.293	0.395	39.364	***
Truncated_AdjP	Truncated_AdjP	48	235	41	5.78	attraction	0.752	0.170	31.583	***
Full clause_AdvP	Full clause_AdvP	728	469	282	174.82	attraction	0.235	0.301	30.374	***
BE-retained MV_AdjP	BE-retained MV_AdjP	174	400	68	35.64	attraction	0.204	0.102	8.606	***
Truncated_NP	Truncated_AdjP	91	235	25	10.95	attraction	0.162	0.068	4.496	***
Full clause_AdjP	Full clause_AdjP	144	220	32	16.22	attraction	0.118	0.081	4.194	***
Full clause_NP	Full clause_NP	228	190	38	22.18	attraction	0.079	0.092	3.494	***
Full clause_AdvP	Full clause_AdjP	728	220	103	82.01	attraction	0.046	0.108	2.872	**
BE-deleted MV_AdjP	BE-retained MV_AdjP	334	400	86	68.41	attraction	0.064	0.055	2.206	**
Full clause_AdvP	BE-retained aux_AdvP	728	44	23	16.40	attraction	0.014	0.153	1.541	*

Table 4.99 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, GloWbE stage IV (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP	Full clause_AdvP	186	131	84	50.87	attraction	0.291	0.348	11.332	***
BE-deleted MV_AdjP	BE-deleted MV_AdjP	93	63	30	12.23	attraction	0.237	0.325	7.472	***
Full clause_NP	Full clause_NP	46	56	14	5.38	attraction	0.207	0.174	3.612	***
BE-retained MV_AdjP	BE-retained MV_AdjP	49	66	13	6.75	attraction	0.142	0.110	2.034	**
BE-deleted MV_AdjP	BE-retained MV_AdjP	93	66	20	12.81	attraction	0.096	0.126	1.816	*

Table 4.100 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, GloWbE stage III (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP	Full clause_AdvP	561	333	216	131.56	attraction	0.249	0.331	26.169	***
BE-deleted MV_AdjP	BE-deleted MV_AdjP	238	176	81	29.50	attraction	0.260	0.334	22.294	***
Full clause_NP	Full clause_NP	166	130	37	15.20	attraction	0.149	0.185	7.527	***
Full clause_AdjP	Full clause_AdjP	83	162	24	9.47	attraction	0.186	0.101	5.252	***
BE-retained MV_AdjP	BE-retained MV_AdjP	124	268	42	23.40	attraction	0.164	0.086	4.646	***
Full clause_AdvP	Full clause_AdjP	561	162	86	64.00	attraction	0.065	0.153	3.854	***
Truncated_NP	Truncated_AdjP	62	170	17	7.42	attraction	0.162	0.064	3.256	***
BE-deleted MV_AdjP	BE-retained MV_AdjP	238	268	55	44.92	attraction	0.051	0.046	1.367	*

Table 4.101 Covarying-collexeme analysis of DELETION × FILLER TYPE interactions across C1 and C2, GloWbE stage II (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP	Full clause_AdvP	110	73	48	25.74	attraction	0.313	0.398	8.980	***
BE-retained MV_AdjP	BE-retained MV_AdjP	29	63	12	5.86	attraction	0.234	0.122	2.295	**
Full clause_NP	Full clause_NP	49	42	13	6.60	attraction	0.155	0.176	2.240	**

Table 4.102 All significant DELETION × FILLER TYPE combinations, and in which corpora they were found (symmetric patterns in bold, shading according to collostructional strength)

DELETION × FILLER TYPE combination	COCA	BNC	GloWbE-GB	GloWbE V	GloWbE IV	GloWbE III	GloWbE II
Truncated_AdjP × Truncated_AdjP	38.836***	38.128***	26.132***	31.583***			
BE-deleted mV_AdjP × BE-deleted mV_AdjP	31.902***	72.189***	24.301***	39.364***	7.472***	22.294***	
Full clause_AdvP × Full clause_AdvP	20.366***	29.015***	20.872***	30.374***	11.332***	26.169***	8.980***
BE-retained mV_AdjP × BE-retained mV_AdjP	4.736***	6.472***	6.874***	8.606***	2.034**	4.646***	2.295***
Full clause_AdjP × Full clause_AdjP	3.486***	3.692***	1.927*	4.194***		5.252***	
Full clause_NP × Full clause_NP	2.043**	2.169**	3.409***	3.494***	3.612***	7.527***	2.240**
Full clause_AdjP × Full clause_NP	2.183**						
Full clause_AdvP × Full clause_AdjP	1.507*	8.966***	4.968***	2.872**		3.854***	
Full clause_AdvP × BE-retained mV_AdjP	1.319*						
Truncated_AdvP × Truncated_AdjP		17.934***	18.337***				
Truncated_NP × Truncated_AdjP		8.334***	4.508***	4.496***		3.256***	
BE-retained_aux_AdvP × Truncated_AdjP		2.368**	1.533*				
Full clause_AdvP × Full clause_NP		2.027**					
Full clause_NP × BE-retained mV_AdjP		1.960*					
BE-deleted mV_AdjP × BE-retained mV_AdjP		1.799*		2.206**	1.816*	1.367*	
Full clause_AdvP × BE-retained_aux_AdvP				1.541*			
Full clause_AdjP × Full clause_NP		1.545*	1.917*				

4.3.5 Deletion/truncation, filler type and lexical filler interactions

In line with Hoffmann et al.'s methodology (2019; 2020), all three variables were also tested for associations. To this end, the variables DELETION, FILLER TYPE, and LEXICAL FILLER were collapsed for C1 and C2, and subjected to covarying-collexeme analyses, whose results are presented in Tables 4.104 to 4.110. Due to the large number of different lexical fillers, only few significantly associated patterns were determined – four in BNC and GloWbE-GB, three in GloWbE stages V and III, and one in COCA and GloWbE stages IV and II. Across all (sub)corpora, the symmetric pattern Full clause_AdvP_more × Full clause_AdvP_more (4.52) emerged as most significant (i.e., with the highest collostructional strength), and the reasonably high unidirectional cue validities ($\Delta P(C2C1) > 0.26$; $\Delta P(C1C2) > 0.37$) indicate that it is strongly entrenched in all varieties of English.

(4.52) [*The* **[[more]_{AdvP} you connect with others**]_{Full clause}]_{C1}
 [*the* **[[more]_{AdvP} your credibility will build.**]_{Full clause}]_{C2}
 (GLOWBE-KE wlp_ke_aaa/wlp_ke_g02 ##1274263 Line: 27)

Furthermore, when comparing the GloWbE subcorpora, there appears to be a tendency towards higher ΔP values in the lower DM stages, as Table 4.103 shows. Thus, the $\Delta P(C2C1)$ values in stages II (0.382), III (0.318), and IV (0.387) are considerably higher than those in stage V (0.285) and GloWbE-GB (0.264). The same applies to $\Delta P(C1C2)$ values in stages II (0.494), III (0.438), and IV (0.492), which are considerably higher than those in stage V (0.387) and GloWbE-GB (0.378). This suggests that the lower DM stages rely more on the pattern Full clause_AdvP_more × Full clause_AdvP_more, indicating that it is more deeply entrenched.

Table 4.103 Comparison of unidirectional cue validities (ΔP values) for the combination Full clause_AdvP_more × Full clause_AdvP_more across all corpora

Corpus	$\Delta P(C2C1)$	$\Delta P(C1C2)$
GloWbE-GB	0.264	0.378
GloWbE stage V	0.285	0.387
GloWbE stage IV	0.387	0.492
GloWbE stage III	0.318	0.438
GloWbE stage II	0.382	0.494

Besides Full clause_AdvP_more × Full clause_AdvP_more, the pattern Full clause_AdvP_sooner × Truncated_AdjP_better (4.53) turned out to be significant in BNC (collostructional strength 18.442***), GloWbE-GB (collostructional strength 24.656***) and stage V (collostructional strength 12.311***).

(4.53) [*The* **[[sooner]_{AdvP} I can get the air-conditioning on,**]_{Full clause}]_{C1} [*the* **[[better]_{AdjP}**]_{C2}
 (BNC W_fict_prose JXX)

Reflecting the findings in sections 4.3.1.1 and 4.3.1.2, the $\Delta P(C2C1)$ values were particularly high (0.389 in BNC, 0.513 in GloWbE-GB, 0.317 in GloWbE stage V), especially when compared to their $\Delta P(C1C2)$ counterparts (0.149 in BNC, 0.203 in GloWbE-GB, 0.129 in GloWbE stage V). In other words, if C1 is a full clause with a *sooner*_{AdvP} filler, then in these three corpora in more than 30% of cases C2 was truncated with a *better*_{AdjP} filler,

suggesting a high degree of entrenchment. In fact, this is evidence for the entrenchment of a particular *sooner*_{C1} × *better*_{C2} CC meso-construction where C2 has been fixed, that is, lexicalized.

Another pattern that emerged as statistically significant in several corpora is Full clause_AdvP_*more* × Full clause_AdvP_*less* (4.54) (collostructional strength 2.897** in GloWbE-GB, 2.263** in stage V, and 2.640** in stage III), indicating that it is also prototypical for the English CC, albeit with considerably lower unidirectional cue validities ($\Delta P(C2C1) < 0.03$; $\Delta P(C1C2) < 0.3$):

(4.54) [*The* [*more*]_{AdvP} *he heard*]_{Full clause}]_{C1} [*the* [[*less*]_{AdvP} *he spoke.*]_{Full clause}]_{C2}
 (GLOWBE-PH wlp_ph_jop/wlp_ph_g01 ##1842031 Line: 11)

In summary, regarding the various interactions that were tested (DELETION × FILLER TYPE; DELETION × FILLER TYPE × LEXICAL FILLER), it can be said that “English CCs exhibit a great number of associations across granddaughter nodes in C1 and C2 that cannot be modelled by a single constructional template” (Hoffmann et al. 2019: 24).

4.4 Productivity of lexical filler slots

To test Brunner and Hoffmann’s “constructional productivity hypothesis” (2020: 15), that is, claims about the productivity of lexical filler slots increasing along the DM cycle, two approaches will be combined (as discussed in section 3.4): First, a calculation of the ratio of significantly associated lexical filler pairs based on the results of the covarying-collexeme analyses in section 4.3.1 (4.4.1) versus the total amount of C1C2 tokens (cf. Hoffmann 2014b), and second, LNRE modeling of the C1 and C2 slots (4.4.2). If the constructional productivity hypothesis holds true, varieties that are farther along the DM cycle should have a lower ratio of lexical filler pairs versus overall C1C2 tokens, and LNRE modeling should reveal steeper curves (indicating higher productivity) for higher DM stages and less steep curves for lower stages.

4.4.1 Filler pairs vs total amount of C1C2 tokens

To obtain a more fine-grained picture, covarying-collexeme analyses were carried out not by DM stage, but for each variety, as Hoffmann had done in his ICE study (2014b). The results are presented in Tables 4.112 through 4.130. They show only relevant results, that is, attracted pairs with an expected frequency ≥ 5 and a significant collostructional strength ≥ 1.31 . Note that none of the lexical filler pairs that Hoffmann used in an earlier study (Hoffmann 2014a,b) crossed the threshold ≥ 5 regarding expected frequency, so that the results below can be regarded as more informative.

As noted in section 2.1.1.2, covarying-collexeme analysis is a statistical test that will produce more significant results the larger a sample size is. When comparing English and German datasets of different sizes, Hoffmann’s solution was to pool data “in a way to ensure that the results are comparable” (i.e., by decade) (2019: 176). This, however, was not feasible with the GloWbE data, so that the following results have to be taken with a grain of salt.

Table 4.104 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, COCA (from Hoffmann et al. 2019: 25) (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	253	201	103	36.09	attraction	0.322	0.388	31.838	***

Table 4.105 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, BNC (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	302	225	112	33.29	attraction	0.306	0.393	40.638	***
Full clause_AdvP_sooner	Truncated_AdjP_better	95	274	48	12.75	attraction	0.389	0.149	18.442	***
BE-deleted MV_AdjP_higher	BE-deleted MV_AdjP_greater	99	143	27	6.94	attraction	0.213	0.151	9.902	***
BE-deleted MV_AdjP_greater	BE-deleted MV_AdjP_greater	82	143	24	5.74	attraction	0.232	0.137	9.509	***

Table 4.106 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, GloWbE-GB (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	366	229	128	54.21	attraction	0.264	0.378	30.097	***
Full clause_AdvP_sooner	Truncated_AdjP_better	82	230	52	12.20	attraction	0.513	0.203	24.656	***
Full clause_AdvP_more	BE-retained aux_AdvP_more	366	35	18	8.29	attraction	0.035	0.284	3.538	***
Full clause_AdvP_more	Full clause_AdvP_less	366	27	14	6.39	attraction	0.027	0.287	2.897	**

Table 4.107 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, GloWbE stage V (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	429	289	159	63.74	attraction	0.285	0.387	40.675	***
Full clause_AdvP_sooner	Truncated_AdjP_better	80	211	33	8.68	attraction	0.317	0.129	12.311	***
Full clause_AdvP_more	Full clause_AdvP_less	429	49	19	10.81	attraction	0.025	0.172	2.263	**

Table 4.108 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, GloWbE stage IV (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	121	87	57	21.98	attraction	0.387	0.492	18.356	***

Table 4.109 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, GloWbE stage III (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	354	230	142	57.66	attraction	0.318	0.438	38.487	***
Full clause_AdvP_more	BE-retained aux_AdvP_more	354	36	20	9.03	attraction	0.041	0.313	4.133	***
Full clause_AdvP_more	Full clause_AdvP_less	354	27	14	6.77	attraction	0.027	0.273	2.640	**

Table 4.110 Covarying-collexeme analysis of DELETION × FILLER TYPE × LEXICAL FILLER interactions across C1 and C2, GloWbE stage II (expected frequency ≥5, only significant attraction)

C1	C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	ΔP(C2C1)	ΔP(C1C2)	Coll. strength	Sign.
Full clause_AdvP_more	Full clause_AdvP_more	70	50	32	11.29	attraction	0.382	0.494	11.534	***

Table 4.111 summarizes the results of the covarying-collexeme analyses, grouping them by DM stages (with BrE included in stage V), also showing the overall amount of C1C2 tokens in each stage. Table 4.111 also shows the ratio¹⁵ obtained “by dividing the token number of significant meso-constructions by the overall number of tokens” (Hoffmann 2014b: 175), and multiplying them by 1,000 for better comparison.

Table 4.111 Filler pairs vs. C1C2 token ratio across DM stages, GloWbE

DM stage	C1C2 tokens	No. of filler pairs	$\Sigma_{\text{Co-varying collexemes}} / \Sigma_{\text{tokens}}$ (in ‰)
V (incl. GB)	3504	10	2.85‰
IV	479	2	4.18‰
III	1420	6	4.23‰
II	312	1	3.21‰

The numbers mostly confirm Brunner and Hoffmann’s productivity hypothesis. As expected, significantly associated lexical filler pairs make up a smaller part of the total number of C1C2 tokens in stage V (2.85‰) than in stage IV (4.18‰), in which the proportion is slightly lower than in stage III (4.23‰), thus indicating a general trend that the higher a DM stage, the more use of macro-constructions and less use of meso-constructions it makes. The only result that does not fit this pattern is that obtained for stage II (3.21‰). One reason for this might be simply the small sample size of stage II varieties compared to other varieties. As discussed in section 2.1.1.2, the probability of detecting significant associations using covarying-collexeme analysis is lower in smaller samples, thus skewing results.

Stage V

Table 4.112 Significantly associated LEXICAL FILLER pairs in GloWbE Great Britain

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>sooner</i>	<i>better</i>	110	314	80	22.27	attraction	34.720	***
<i>more</i>	<i>more</i>	412	284	161	75.44	attraction	32.783	***
<i>less</i>	<i>better</i>	35	314	16	7.09	attraction	3.286	***
<i>more</i>	<i>less</i>	412	37	17	9.83	attraction	2.096	**
<i>bigger</i>	<i>better</i>	34	314	12	6.88	attraction	1.545	*

Table 4.113 Significantly associated LEXICAL FILLER pairs in GloWbE Canada

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	152	112	56	29.76	attraction	8.693	***

¹⁵ Note that these ratios are only comparable between GloWbE varieties due to the data being a stratified random sample, as was also the case with C1C2:C2C1 ratios (see section 4.2.1).

Table 4.114 Significantly associated LEXICAL FILLER pairs in GloWbE Ireland

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	90	65	33	14.96	attraction	7.254	***

Table 4.115 Significantly associated LEXICAL FILLER pairs in GloWbE Australia

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	157	114	61	28.41	attraction	12.703	***
<i>sooner</i>	<i>better</i>	45	89	26	6.36	attraction	12.134	***

Table 4.116 Significantly associated LEXICAL FILLER pairs in GloWbE New Zealand

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	87	54	33	13.05	attraction	9.668	***

Stage IV*Table 4.117 Significantly associated LEXICAL FILLER pairs in GloWbE Singapore*

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	41	40	27	10.25	attraction	10.470	***

Table 4.118 Significantly associated LEXICAL FILLER pairs in GloWbE South Africa

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	60	44	29	13.07	attraction	7.864	***

Table 4.119 Significantly associated LEXICAL FILLER pairs in GloWbE Jamaica

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	37	23	15	7.27	attraction	3.648	***

Stage III*Table 4.120 Significantly associated LEXICAL FILLER pairs in GloWbE Philippines*

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	49	33	19	9.19	attraction	4.221	***

Table 4.121 Significantly associated LEXICAL FILLER pairs in GloWbE Malaysia

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	45	27	16	7.74	attraction	3.606	***

Table 4.122 Significantly associated LEXICAL FILLER pairs in GloWbE India

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	92	74	42	21.68	attraction	7.987	***

Table 4.123 Significantly associated LEXICAL FILLER pairs in GloWbE Kenya

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	41	33	23	9.80	attraction	7.424	***

Table 4.124 Significantly associated LEXICAL FILLER pairs in GloWbE Tanzania

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	36	22	15	8.00	attraction	3.196	***

Table 4.125 Significantly associated LEXICAL FILLER pairs in GloWbE Nigeria

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	49	35	21	10.72	attraction	4.386	***

Table 4.126 Significantly associated LEXICAL FILLER pairs in GloWbE Hong Kong

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	31	28	17	5.64	attraction	6.986	***

Table 4.127 Significantly associated LEXICAL FILLER pairs in GloWbE Sri Lanka

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	37	18	15	6.06	attraction	5.509	***

Table 4.128 Significantly associated LEXICAL FILLER pairs in GloWbE Ghana

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	31	27	19	7.47	attraction	7.123	***

Stage II

Table 4.129 Significantly associated LEXICAL FILLER pairs in GloWbE Bangladesh

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	36	29	17	7.57	attraction	4.606	***

Table 4.130 Significantly associated LEXICAL FILLER pairs in GloWbE Pakistan

LEX. FILLER C1	LEX. FILLER C2	Freq. C1	Freq. C2	Obs. C1C2	Exp. C1C2	Relation	Coll. strength	Sign.
<i>more</i>	<i>more</i>	51	34	27	9.97	attraction	10.974	***

4.4.2 LNRE models

As noted in section 4.4.1 above, the results of the covarying-collexeme analyses have to be regarded with caution, because the considerably different GloWbE subcorpus sizes might have produced skewed data. Therefore, the GloWbE data was also subjected to LNRE modeling, which should be more reliable in determining the productivity of the lexical filler slots. The results are shown in figures 4.56 (C1 lexical filler productivity) and 4.57 (C2 lexical filler productivity); they are overlaid in Figure 4.58 (with reduced line widths) for a better comparison of the C1 and C2 slots.

With one exception, Figure 4.56 (productivity of the C1 slot) corresponds to what was expected: stage II has the lowest productivity, followed by stage IV, BrE, and stage V, in ascending order. Stage III, however, is the most productive according to the LNRE model, which does not fit to the pattern. In Figure 4.57 (productivity of the C2 slot), the curves are generally closer to each other, with the exception of stage II, which, as was expected, shows the lowest productivity. Stage V shows the highest productivity, followed by stage IV and stage III. BrE is somewhat of an exception to the pattern here, being just below stage III. Figure 4.58 reveals that in stages II and IV, the C2 slot is more productive than the C1 slot; the opposite is true for stages III, V, and BrE.

LNRE models were also calculated for lexical filler combinations, e.g. *more*_{C1}-*more*_{C2}. The resulting curves are shown in Figure 4.59. It is striking how similar they are, indicating hardly any differences between DM stages. In fact, even the curves in Figures 4.56 and 4.57 are quite similar when compared to those determined by Brunner and Hoffmann (reproduced in 4.60) for V slot productivity in their study on the *way*-construction (2020). This suggests that actually, there is little difference in productivity between DM stages, contradicting Brunner and Hoffmann's productivity hypothesis regarding English CCs.

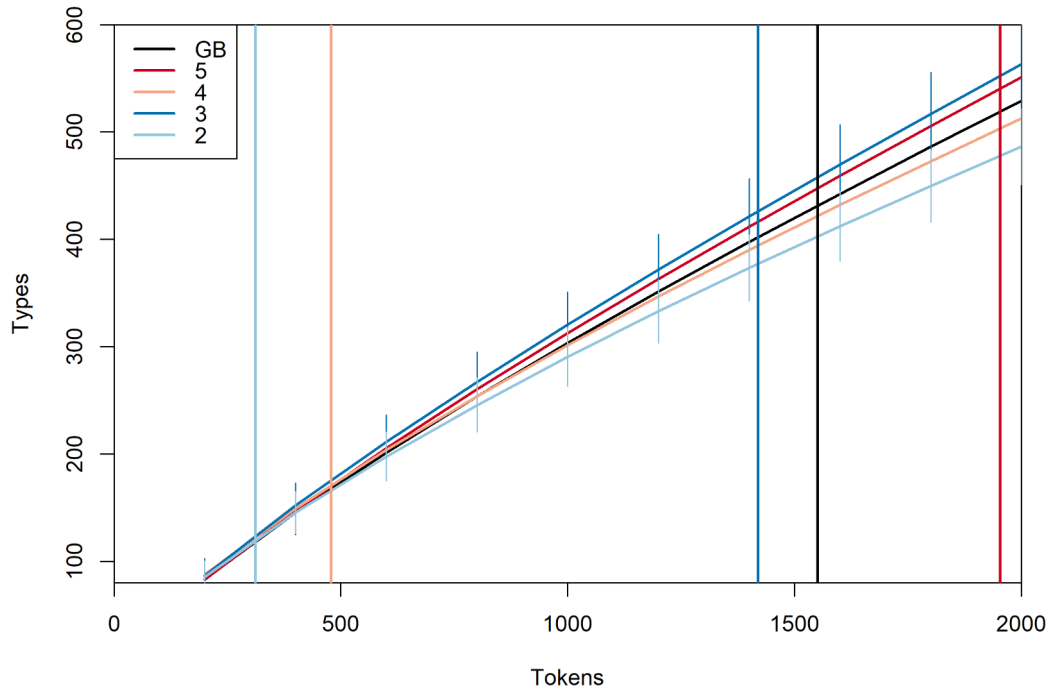


Figure 4.56 LNRE model of C1 Lexical filler productivity, DM stages in GloWbE. Vertical lines indicate sample size

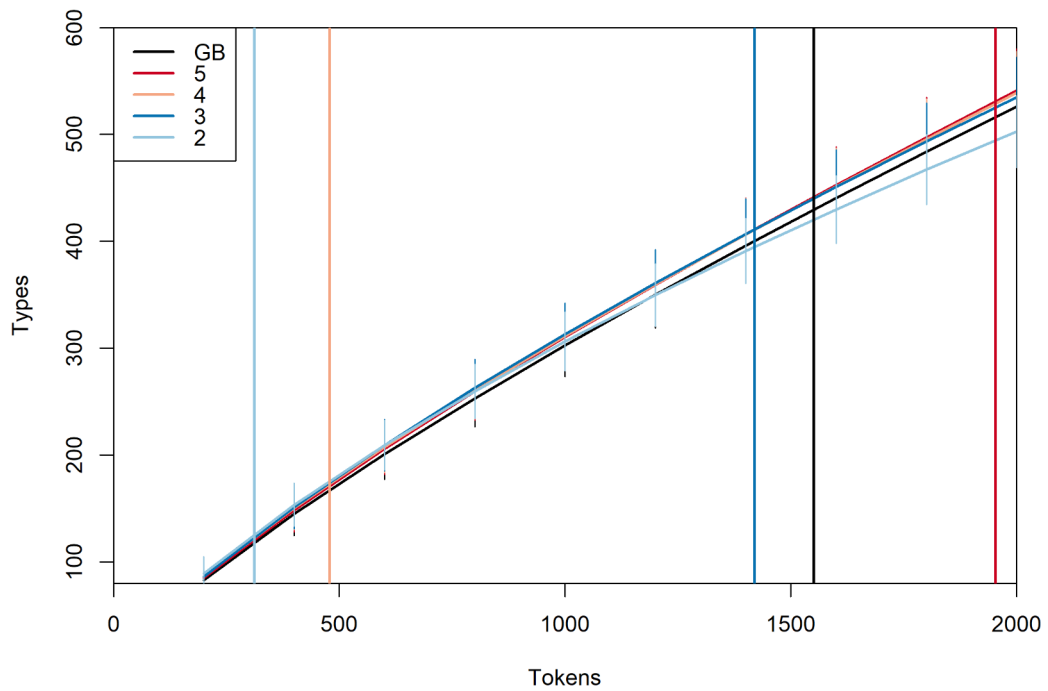


Figure 4.57 LNRE model of C2 Lexical filler productivity, DM stages in GloWbE. Vertical lines indicate sample size

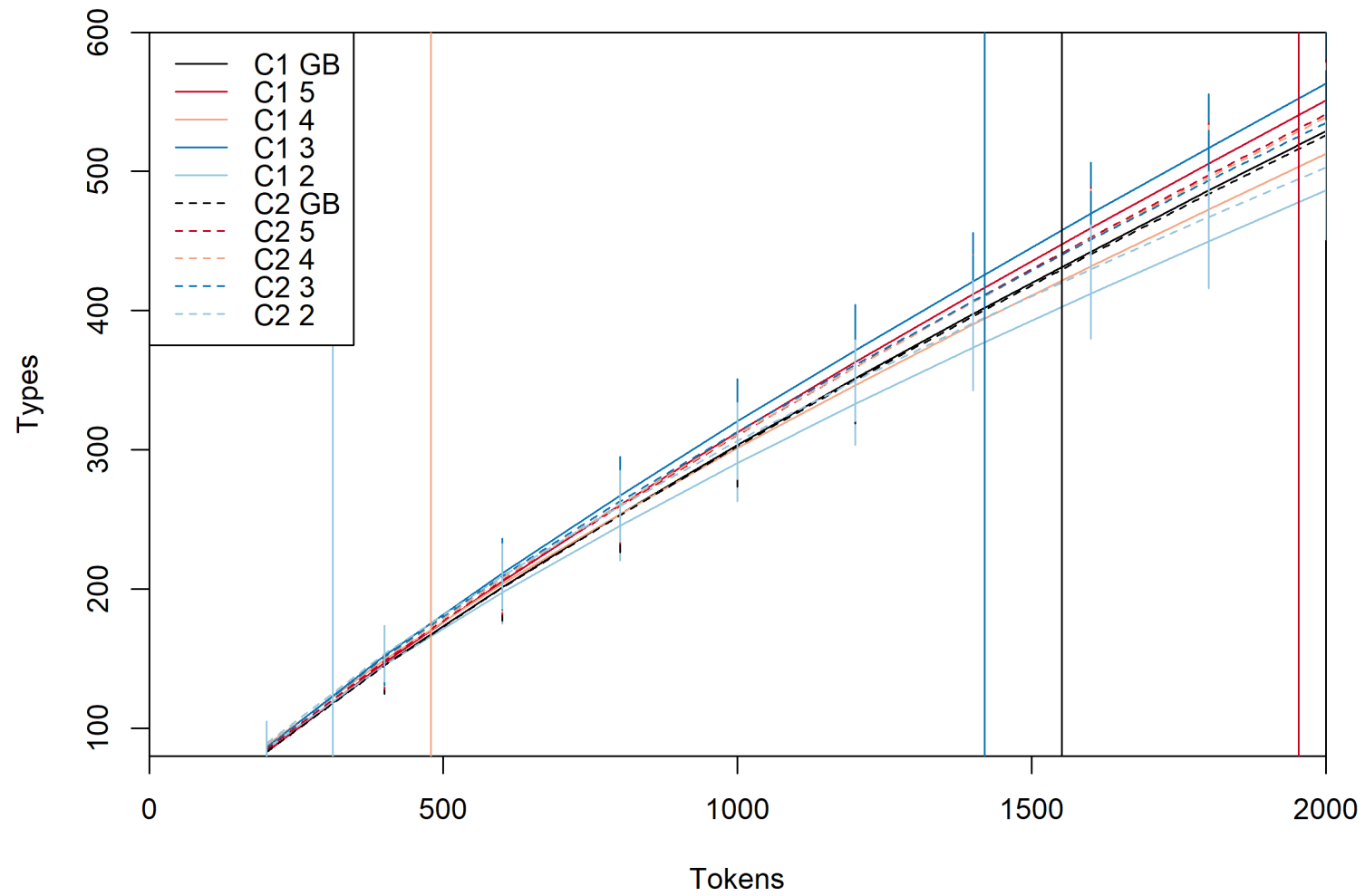


Figure 4.58 LNRE model of C1 and C2 Lexical filler productivity, DM stages in GloWbE. Vertical lines indicate sample size

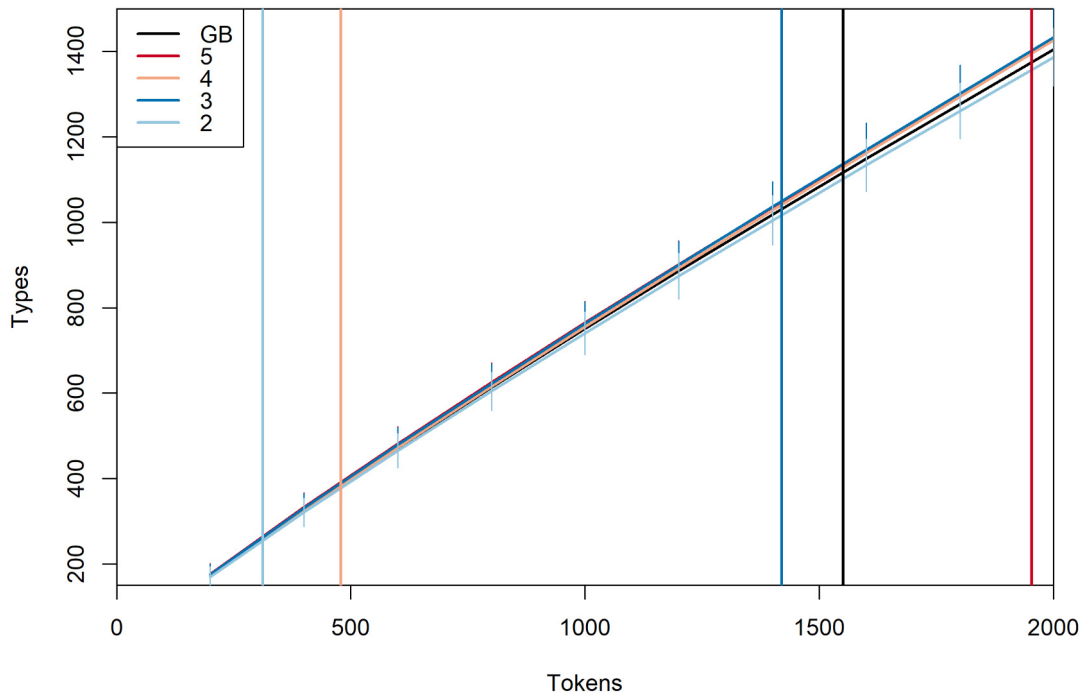


Figure 4.59 LNRE model of C1xC2 Lexical filler combination productivity, DM stages in GloWbE. Vertical lines indicate sample size

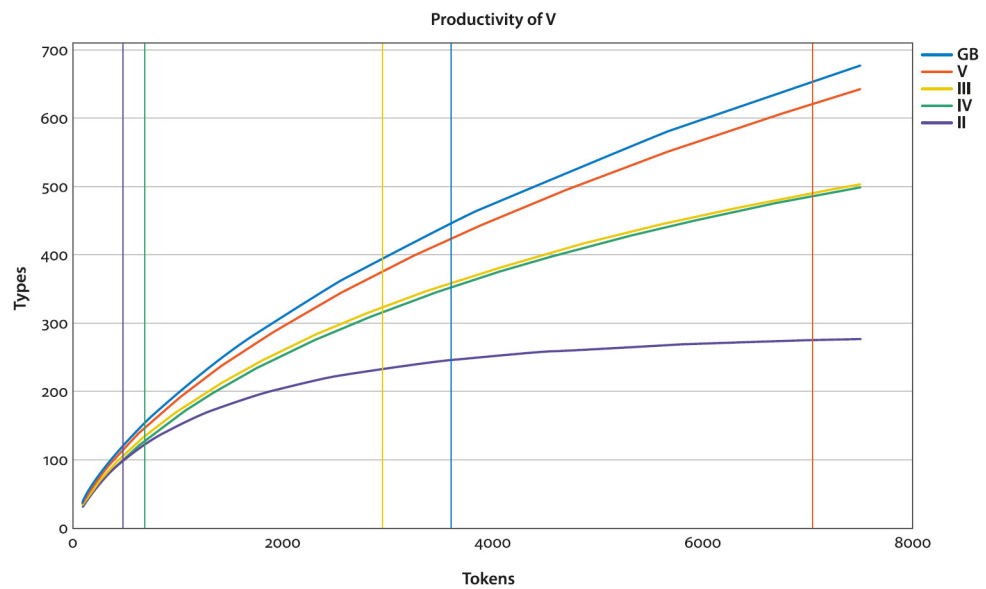


Figure 4.60 LNRE model of V slot productivity in Brunner and Hoffmann's study on the way-construction (2020: 15)

Further evidence comes from a comparison of the proportion of hapaxes¹⁶ among the overall amount of lexical filler pairs – recall that Hoffmann et al. used this to draw attention to the “variability and productivity” of the lexical filler slots in their COCA data (2019: 15). Table 4.131 shows a striking similarity between all corpora, with a maximum deviation of no more than 4.25% between the lowest (BNC, 86.22%) and highest (GloWbE stage II, 90.47%) percentages.

Table 4.131 Filler pair and hapax counts across COCA, BNC, and GloWbE

Corpus	Filler pairs	Hapaxes	$\Sigma_{\text{hapaxes}} / \Sigma_{\text{filler pairs}}$ (in %)
COCA	965	855	88.60%
BNC	1248	1076	86.22%
GloWbE-GB	975	859	88.10%
GloWbE stage V	1248	1116	89.42%
GloWbE stage IV	337	304	90.21%
GloWbE stage III	916	821	89.63%
GloWbE stage II	231	209	90.47%

A plausible explanation for this observation might be that lexical fillers are considerably more substantive than filler types or deletion patterns and thus depend more on extralinguistic factors. Evidence for this comes from other studies: Gries and Mukherjee, for example, found no significant stage-specific effects in their study of *n*-grams across HKE, IndE and SingE. This led them to suggest that DM stages are ‘less likely to be reflected in lexical differences because lexis-related differences are topic-dependent and volatile’ (Gries and Mukherjee 2010: 537, as noted by Schneider 2014: 14). A different explanation could be that unlike the *way*-construction, which is highly idiomatic and thus specific to English, the CC construction has very similar counterparts regarding form and semantics in many other languages (cf. Table 1.1 in chapter 1)¹⁷, a fact that can be assumed to also apply to the respective sub- and adstrate languages of the GloWbE varieties. Thus, it is possible that speakers of lower-stage L2 varieties use the English CC more intuitively, and also more often, than very specific constructions like the *way*-construction, which in turn leads to the very similar productivity across varieties and DM stages.

This explanation receives further support from a comparison of ratios, a method employed by Brunner and Hoffmann in the context of their “overall frequency hypothesis” (2020: 9). While calculating ‘real’ per-million-word frequencies is not possible (see also the discussions in sections 2.3.1.3 and 4.2.1) because the GloWbE data set used for the present study is a stratified random sample, at least relative frequencies can be calculated and compared between the GloWbE subcorpora.

16 Although it is acknowledged that, as discussed in section 2.1.1.3, hapax counts as a measure of productivity cannot be assumed to be entirely reliable when comparing corpora of different sizes.

However, note that the LNRE models do reflect the findings from the hapax counts, that is, very similar degrees of productivity across corpora and varieties/ DM stages.

17 I am grateful to my colleague Thomas Brunner for bringing this explanation to my attention.

Table 4.133 and Figure 4.61, which show relative frequencies of C1C2 structures in the individual varieties, reveal a slight tendency towards higher such relative frequencies in varieties that are further along the DM cycle. Whereas BrE and all stage V varieties have a ratio of >4.0 (with the exception of IrE, which comes very close with a ratio of 3.87), the lower stages only cross this threshold in two cases: SAfE (4.45) and PhilE (4.07). However, with only four exceptions (JamE, TanzE, SriLE, GhE), even the lower-stage varieties do not have relative frequencies <3.0.

A similar trend is evident from Table 4.132, which shows frequencies across DM stages: Again, there is only a slight difference between the highest relative frequency (stage V, 4.20) and the lowest (stage III, 3.33). However, note again the slight tendency towards lower relative frequencies in the lower stages.

Table 4.132 Relative frequency ($\Sigma_{C1C2} / \Sigma_{Corpus\ size}$) of C1C2 per million word by DM stage, GloWbE

DM stage	Corpus size	C1C2	$\Sigma_{C1C2} / \Sigma_{Corpus\ size}$
GB	387,615,074	1551	4.00
V	465,393,257	1953	4.20
IV	128,002,869	479	3.74
III	426,787,011	1420	3.33
II	91,025,407	312	3.43

It can thus be concluded that the CC construction (unlike the *way*-construction) is characterized by a similar productivity across all DM stages, with only a slight tendency towards less productivity in the lower stages.

4.5 Prototypical fillers

To test Brunner and Hoffmann’s “prototypical filler hypothesis”, which posits that “the less entrenched a variety is according to the Dynamic Model, the stronger the tendency will be to select prototypical, or frequent, fillers in constructional slots” (2020: 9), it was decided to investigate possible three-way associations between DM stages in GloWbE and the lexical filler slots in C1 and C2. As discussed in section 3.5, hapaxes were excluded from the HCFA, whose results are presented in Table 4.134. It shows 11 types, of which eight are from the BrE component or stage V varieties of GloWbE, and three are from stage III varieties (NigE, GhE and IndE). This does not confirm Brunner and Hoffmann’s prototypical filler hypothesis for CCs in English – rather, the HCFA results suggest that there are *less* significant lexical filler interactions in lower DM stages, and *more* in the higher ones. The reasons for this state of affairs are difficult to determine at this point, so that further research in this regard is certainly warranted.

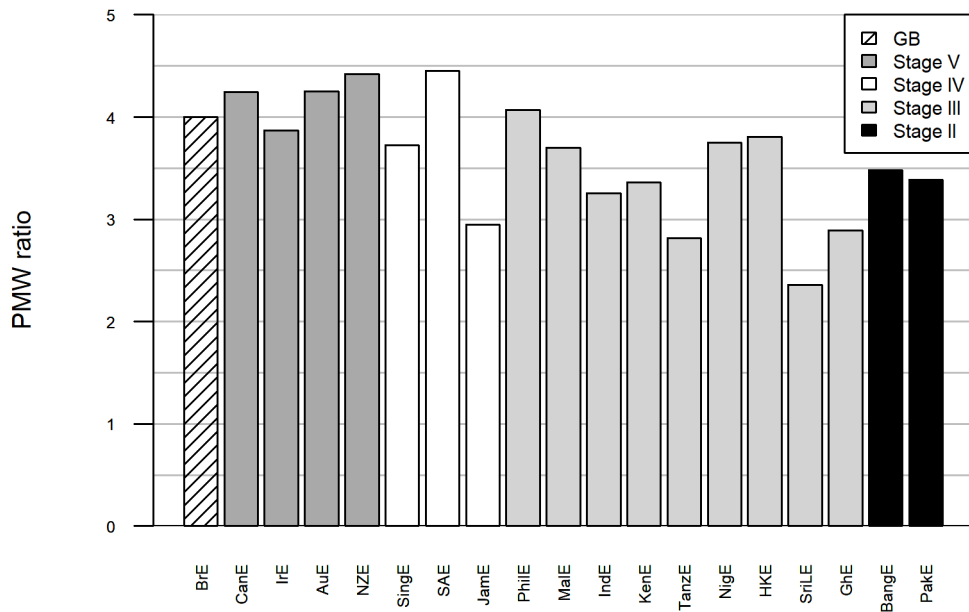


Figure 4.61 Relative frequency of C1C2 per million word by variety, GloWbE

Table 4.133 Relative frequency ($\Sigma_{C1C2} / \Sigma_{Corpus\ size}$) of C1C2 per million words by variety, GloWbE

DM stage	Variety	Corpus size	C1C2	$\Sigma_{C1C2} / \Sigma_{Corpus\ size}$
Reference variety	BrE	387,615,074	1551	4.00
	CanE	134,765,381	572	4.24
	IrE	101,029,231	391	3.87
	AuE	148,208,169	630	4.25
	NZE	81,390,476	360	4.42
V	SingE	42,974,705	160	3.72
	SAfE	45,364,498	202	4.45
	JamE	39,663,666	117	2.95
IV	PhilE	43,250,093	176	4.07
	MalE	42,420,168	157	3.70
	IndE	96,430,888	314	3.26
	KenE	41,069,085	138	3.36
	TanzE	35,169,042	99	2.81
III	NigE	42,646,098	160	3.75
	HKE	40,450,291	154	3.81
	SriLE	46,583,115	110	2.36
	GhE	38,768,231	112	2.89
II	BangE	39,658,255	138	3.48
	PakE	51,367,152	174	3.39

Table 4.134 HCFA of DELETION, GloWbE (only significant results)

LEXICAL FILLER C1	LEXICAL FILLER C2	VARIETY	Freq.	Exp.	Cont. chisq.	Obs-exp	<i>p</i> -value	DEC.	Q
<i>more</i>	<i>better</i>	BrE	34	100.02	43.58	<	0.00000000030231992482	***	0.033
<i>sooner</i>	<i>better</i>	BrE	80	25.74	114.36	>	0.0000000000002272282	***	0.026
<i>sooner</i>	<i>more</i>	BrE	0	34.83	34.83	<	0.00000000002688489917	***	0.017
<i>more</i>	<i>better</i>	AuE	10	35.65	18.46	<	0.0169462747314857	*	0.013
<i>sooner</i>	<i>better</i>	IrE	18	4.39	42.17	>	0.0429040400020669	*	0.007
<i>earlier</i>	<i>better</i>	NigE	15	0.37	582.95	>	0.0000000000000074632	***	0.007
<i>sooner</i>	<i>sooner</i>	BrE	15	2.10	79.35	>	0.000337579947839918	***	0.006
<i>longer</i>	<i>harder</i>	BrE	11	1.44	63.36	>	0.0178620226384755	*	0.005
<i>longer</i>	<i>greater</i>	AuE	10	1.35	55.40	>	0.0781537756255634	ms	0.004
<i>sooner</i>	<i>sooner</i>	AuE	10	0.75	114.47	>	0.000363656698285169	***	0.004
<i>earlier</i>	<i>better</i>	GhE	7	0.23	202.09	>	0.000242732826744035	***	0.003
<i>more time</i>	<i>less time</i>	BrE	5	0.01	1750.58	>	0.00000022755894562799	***	0.002
<i>higher</i>	<i>lower</i>	IrE	4	0.06	279.31	>	0.0185137269009038	*	0.002
<i>faster</i>	<i>higher</i>	IndE	4	0.04	376.66	>	0.00585510638973913	**	0.002

4.6 Summary

Corroborating the findings of earlier small-scale studies and filling gaps left by previous research, this chapter presented the results of the first comprehensive large-scale corpus study of CCs covering more than a dozen English varieties. The investigation was based on three corpora: COCA, BNC, and GloWbE, from which altogether more than 10,000 CC tokens were retrieved and analyzed. The first thing to note is that the results closely resemble earlier studies based on considerably smaller corpora (e.g. Hoffmann 2014b, 2019), thus confirming Hoffmann et al.'s conclusion "that even for such a mildly frequent construction (that roughly appears 30–40 times in one million words) smaller corpora can already yield interesting first results that are supported by data from bigger corpora" (2019: 32). The implications of this finding are clear: It can be quite safely assumed that even small sets of corpus data may be used to draw informative conclusions about linguistic features, underscoring Greenbaum and Nelson's statement that "for most grammatical and discourse studies, corpora of a million words are more than adequate" (1996: 13). Beyond demonstrating the viability of employing small corpora for investigating infrequent constructions, however, it has also become apparent that "the big/small divide in corpus work" (Mair 2005: 24) must be overcome. Instead of deciding between one or the other, small and large corpora should be used in a complementary fashion (as advocated e.g. by Mair (2005)), focusing on each of their respective strengths: while large corpora are obviously superior in size, their smaller counterparts are more reliable since they are compiled more carefully. This insight is particularly relevant for research projects in which there are limitations to the amount of time or manpower that can be afforded, an issue commonly encountered in linguistics.

Returning to the corpus study, the data was subjected to various statistical analyses with the aim of uncovering meso-constructions and determining their degrees of entrenchment. Throughout, a clear tendency emerged: Confirming Hoffmann et al.'s (2020) claim that they are remnants of earlier stages, hypotactic features are strongly dispreferred across all varieties of English, while symmetry now plays a dominant role.

Thus, *that*-complementizers turned out to be generally dispreferred in all corpora, making up no more than 2% of tokens in any (sub-)corpus. Furthermore, it was shown that *that*-complementizers are preferred in the spoken registers of COCA and BNC, and that they were particularly disliked in stage III varieties. Compared to deletion and non-inversion, subject-auxiliary inversion (SAI) was shown to be the least preferred alternative for both auxiliary and main verb BE; in no corpus did the share of SAI exceed ten per cent. Unlike *that*-complementizers, SAI was found to be a feature that is more typical of the written mode, in particular, academic texts. DM stage-specific effects could not be determined for SAI. Thus, it was concluded that across all varieties, hypotactic features play a minor role in the CC construction.

Rather, statistical analyses provided overwhelming evidence in support of a paratactic analysis of the English CC: The cross-clausal associations that were unearthed by means of HCFA and covarying-collexeme analysis were, with one exception, exclusively symmetric. Across varieties and DM stages, this finding applied to filler types as well as deletion and truncation phenomena (which were shown to be more deeply entrenched), and to a majority of the interactions between them. However, it must be conceded that some of the filler type

associations could be partially explained with lexical effects: The $\text{AdvP}_{C1} \times \text{AdvP}_{C2}$ association effect could be attributed, in part, to the significantly associated lexical filler combination $\text{more}_{\text{AdvP}} \times \text{more}_{\text{AdvP}}$, which functioned as a strong prototype. The existence of meso-constructions also has serious implications for ‘top-down’ analyses of the CC with a maximally abstract schema or single constructional template – recall Hoffmann et al.’s observation that “English CCs exhibit a great number of associations across granddaughter nodes in C1 and C2 that cannot be modelled by a single constructional template” (Hoffmann et al. 2019: 24).

An analysis of lexical fillers revealed the entrenchment of periphrastic comparative forms, in particular, a meso-constructional template employing $\text{more}_{C1} \times \text{more}_{C2}$. Most examples of unusual periphrastic forms (cf. 4.19-4.23) and ‘redundant’ forms (4.24-4.26) were found in C2 clauses, suggesting a deeper entrenchment of construction-specific *more* in C2. No DM stage-specific qualitative meso-constructional innovations could be found. Rather, it appears that qualitative innovations are more characteristic of the C2 subclause.

Regarding clause order, it was shown that there is a statistically significant preference for the iconic C1C2 order. This confirms the prediction that processing effects lead to the ‘cause-before-effect’ order (i.e., C1C2) being preferred. The fact that such a pronounced preference could be found across all varieties underscores Hawkins’ (2004) Performance-Grammar Correspondence Hypothesis, which predicts that the degree of entrenchment of a construction is evident from corpus frequencies. Despite the dominance of bi-clausal C1C2 structures in the corpus data, there were considerably more cases of C2C1/C1C2C3 in the data than *that*-complementizers and SAI, lending further support to a paratactic analysis of CCs (see below). Concerning clause-initial *the* in C2C1, the data showed that this is a highly infrequent feature, with only a handful of cases that made up no more than 8% of total tokens. In this regard, it is therefore not possible to challenge claims about the absence of clause-initial elements in C2 being proof of a separate CC’ construction that is unrelated to the CC with its C1C2 order. Regarding DM model stages, it was shown that the C1C2:C2C1 ratio is lower in the stage V varieties, so that it was concluded that in the lower stages, the iconic C1C2 order is more deeply entrenched, at the expense of C2C1.

An investigation of the productivity of the lexical filler slot showed a common pattern across varieties: The iconic CC construction (i.e., the C1C2 order) has a more productive C1 slot, while the non-iconic CC’ construction (i.e., the C2C1 order) has a more productive C2 slot. When C1 and C2 are combined, the C2C1 data set turned out to be considerably more productive than the C1C2 data set. However, it was also shown that the C1 slot is considerably less productive than the C2 slot in the C2C1 order, whereas in the C1C2 data sets, the difference between the C1 and C2 slots was much less pronounced. Across DM stages, the C2C1 data sets were more productive. All of these findings mean that Hoffmann’s claim that “the iconic C1C2 CC construction is also much more productive than the non-iconic C2C1 CC’ construction” (2019: 71) will have to be subjected to a more differentiated analysis that takes into account each subclause separately.

Tripartite structures turned out to be more common than the non-iconic C2C1, with no clear variety-specific or stage-specific effects, although a slight trend towards higher proportions of C1C2 (vs. C1C2C3) in the lower DM stages could be determined. The relatively high frequency of C2C1 and C1C2C3 structures comes with further implications for analyses based on maximally abstract schemas or simple constructional templates – recall that e.g. den

Dikken explicitly states that tripartite stacked CCs without overt conjunctions (referred to as C1C2C3 in this chapter) are ungrammatical (2005: 503). Rather, the evidence from the corpus data supports a constraint-based analysis of the CC and, moreover, makes a compelling case for parataxis: As discussed in section 3.2.2, C1C2C3 structures can only be analyzed as coordinated structures (as noted by Hoffmann 2019: 105). Regarding DM stages, a covarying-collexeme analysis found that stacked CCs are more preferred in the higher stages and a stronger entrenchment of C1C2 in the lower stages.

Turning to the productivity of the lexical filler slots, the calculation of ratios of significantly associated lexical filler pairs against the total amount of C1C2 tokens of each DM stage showed a trend that can be summarized as ‘the higher a DM stage, the more use of macro-constructions and less use of meso-constructions it makes’. However, this effect is only ever so slight, and LNRE modeling revealed hardly any differences between DM stages regarding the productivity of lexical filler slots. This contradicts Brunner and Hoffmann’s constructional productivity hypothesis, according to which “varieties in low stages of the Dynamic Model show less productivity of [...] slots of [a] construction than varieties in high developmental stages” (Brunner and Hoffmann 2020: 9). Further evidence comes from the finding that there was a striking similarity between all corpora regarding the proportion of hapaxes to total lexical filler pairs, with a maximum deviation of no more than 4.25% between the lowest (BNC, 86.22%) and highest (GloWbE stage II, 90.47%) percentages. Thus, it was concluded that the English CC construction (unlike the *way*-construction) is characterized by a similar productivity across all DM stages, with only a slight tendency towards less productivity in the lower stages. A possible explanation for this might be the fact that the CC construction has very similar counterparts regarding form and semantics in many other languages (cf. Table 1.1 in chapter 1), including sub- and adstrates of the investigated varieties.

Finally, Brunner and Hoffmann’s prototypical filler hypothesis (2020: 9) was tested. In this context, an HCFA revealed that there were actually less significant lexical filler interactions in lower DM stages, and more in the higher ones, *contra* the prototypical filler hypothesis. Thus, it could not be confirmed that “New Englishes at lower stages of Schneider’s cycle have repeatedly been found to prefer frequent over infrequent forms” (Brunner and Hoffmann 2020: 7), with the reverse effect emerging. However, again this might have to do with the fact that unlike the *way*-construction that is very specific to English, the CC construction has a very similar form across languages, including those that might influence PCEs as ad- and substrates.

While the corpus study was thus able to shed light on a great deal of idiosyncrasies of the English CC, confirming previous findings and providing new information about its meso-constructional network, several questions remain. First, while an analysis of the corpus data did show that *that*-complementizers are dispreferred across varieties, it was not possible to investigate all possible combinations across C1 and C2, for lack of sufficient tokens. Previously, this has been referred to as the negative data problem (see section 2.1): just because *that*-complementizers in certain combinations did not show up in the corpus data or show up with an extremely low frequency (e.g. *that* in C1 and C2, of which none were found in BNC and only two in GloWbE) does not mean that they are not part of the language system.

Second, some idiosyncrasies that play an important role in the hypotaxis vs. parataxis debate could simply not be investigated using corpus data: Asymmetric encoding using *as*_{C1} and *then*_{C2} as clause-initial elements, for example, or object pronoun extraction from embedded CCs. Both of these were disregarded by the *R* script (see section 2.3.1.1) that extracted CCs from the corpora. Thus, it was decided to rely on three psycholinguistic experiments, carried out at six locations around the world, to investigate *that*-complementizers, asymmetric encoding, and object pronoun extraction in English CCs. The results are presented in the next chapter.

5 Introspective experiment results

[F]uture studies are definitely required that test the results from the present study using various experimental methods. (Hoffmann 2019: 18)

In the previous chapter, the statistical analysis of corpus data provided empirical evidence for the entrenchment of cross-clausal combinations regarding English CCs, and thus, the existence of meso-constructions across World English varieties of all Dynamic Model stages. On the more abstract meso-constructional level, combinations were overwhelmingly symmetric (e.g. ADJP_{C1}-ADJP_{C2}), suggesting that formally, English CCs strongly prefer encoding the symmetric semantics of the construction, and thus are “rather paratactic than hypotactic in nature” (Hoffmann et al. 2020). This is underscored by the finding that across all varieties, hypotactic features such as *that*-complementizers play but a marginal role, evident from their low frequency in corpora, although it appears that remnants of this hypotactic feature are more entrenched in varieties in higher stages of the Dynamic Model.

However, the low frequency of hypotactic phenomena in the corpus data illustrates a well-known disadvantage of corpus studies that is often referred to as the “negative data problem” (Hoffmann 2011: 175). As was discussed in section 2.4, just because a structure does not show up in corpus data does not mean that it is ungrammatical and *vice versa*, just because it *does* show up does not mean that it is grammatical (see also the discussion in McEnery and Wilson 1996: 4-10). Thus, it was decided to corroborate the findings from the corpus study regarding *that*-complementizers with introspection experiments carried out in the USA, Singapore, South Africa, and Kenya. Additionally, it was decided to investigate two phenomena which were not investigated in the corpus study due to their low frequency: the asymmetric encoding of CCs (i.e., with different clause-initial elements), and object pronoun extraction (see section 3.1.2).

The experiments were designed as Magnitude Estimation tests (METs), based on Hoffmann’s method (2011, 2013b) of eliciting speakers’ judgments of syntactic structures (see section 2.4). As in section 2.1.2, the premise is that participants will give low-frequency phenomena generally lower acceptability ratings than high(er) frequency phenomena, but still considerably better ratings than ungrammatical structures, making it possible to “separate more prototypical grammatical constructions from less prototypical ones” (Hoffmann 2013b: 100). In addition, differences between varieties can be teased apart if data is available from different locations, although it is to be expected that these differences will be minimal: Recall the concept of a ‘common core’ grammar of World Englishes, discussed in section 1.3 and Mair’s observation that “accent divides and grammar unites” (2008: 156). In this context, it has also been argued that there is a “core probabilistic grammar” shared by World Englishes (Szmrecsányi et al. 2016: 109, quoted by Laporte 2019: 272) that manifests itself in “nativization effects [that] are only small relative to the linguistic variables that predict the use of [syntactic] alternations” (Laporte 2019: 272). Nevertheless, it will be shown that in several cases, the experiments revealed systematic differences across varieties that constitute evidence for variety-specific effects in meso-constructional networks.

The MET approach is not only suitable for clarifying disputes that have arisen from introspective studies, but also for testing the predictions of the Dynamic Model, which posits

(as discussed in sections 1.3 and 1.4) that the evolutionary stages of World Englishes are characterized by distinct linguistic characteristics, in particular, in their development “along the lexis-syntax cline” Hoffmann (2019: 188), where CCs are located.

Three experiments¹ were designed and carried out to investigate the following hypotactic features:

- (i) the acceptability of **that-complementizers** in C1 and C2
- (ii) the acceptability of **asymmetric encoding with $as_{C1}... then_{C2}$**
- (iii) the acceptability of **object pronoun extraction** from C1 and C2

Based on the corpus study results (cf. Chapter 4) and claims from previous introspective studies, the aim was to test whether

- (a) *that*-complementizers are dispreferred in general across all varieties, reflecting the “paratactic (i.e., quasi-coordinate) syntax” of CCs in PdE (Culicover and Jackendoff 1999: 551);
- (b) *that*-complementizers in C1 only, “as a weak indication that C1 used to be syntactically subordinate to C2” (Hoffmann 2019: 210), are preferred in stage V varieties, reflecting the particular input situations (speakers with slightly different mental networks) where in lower-stage varieties, this feature has been mostly lost (‘leveled’) due to its low frequency;
- (c) *that*-complementizers are preferred in C1 clauses, which in earlier stages of English used to be syntactically marked as subordinate clauses (Hoffmann 2014a, 2017b, 2019);
- (d) *that*-complementizers are acceptable in C2, as claimed by Hoffmann (2014a: 96) and Culicover and Jackendoff (1999: 546), but not entrenched because they “are analogically formed on the few C1 clauses with a *that*-complementizer” (Hoffmann 2019: 212);
- (e) there are variety-specific effects (reflecting different input situations) where speakers of varieties with more entrenched parallel structures prefer parallel patterns (i.e., $that_{C1} \times that_{C2}$) and speakers of varieties with more entrenched asymmetric structures disprefer such parallel patterns;
- (f) speakers of varieties with entrenched asymmetric structures rate structures with asymmetric clause-initial elements (i.e., $as_{C1}... then_{C2}$) as more acceptable than speakers of varieties which do not;
- (g) reflecting Culicover and Jackendoff’s analysis of CCs as paratactic structures, across-the-board extraction is preferred, proving the “status of coordinate clauses” (1999: 567);
- (h) or, reflecting Den Dikken’s hypotaxis approach and his claim that C1 is an adjunct clause and the corresponding claim of a “parasitic gap” (2005: 507), extraction from only C2 is rated better than extraction from only C1, which in turn is ungrammatical;

Finally, from a more general perspective, the aim was to use the findings from all three experiments to test how paratactic or hypotactic CCs are encoded in each English variety.

Table 5.1 shows which predictors emerged as significant after applying stepwise regression (see section 2.1.2.1) on the data sets of the three experiments.

1 All documents related to the METs, including scans of the completed questionnaires and data sets containing the results are available in an OSF repository that is accessible via the following link: <https://osf.io/qar62/>

Table 5.1 Significant and non-significant predictors for each experiment, determined by means of stepwise regression

	Significant predictors	Non-significant predictors
Experiment 1:	LEXICALIZATION (random effect)	SUBJECT (random effect)
<i>That</i> -complementizers	THAT_C1	MS (random effect)
	THAT_C2	THAT_C1:THAT_C2:VARIETY
	VARIETY	THAT_C2:VARIETY
	THAT_C1:THAT_C2	
	THAT_C1:VARIETY	
Experiment 2:	LEXICALIZATION (random effect)	SUBJECT (random effect)
Asymmetric encoding	AS_C1	MS (random effect)
	THEN_C2	AS_C1:THEN_C2:VARIETY
	THEN_C2:VARIETY	AS_C1:VARIETY
		AS_C1:THEN_C2
		VARIETY
Experiment 3:	LEXICALIZATION (random effect)	SUBJECT (random effect)
Object pronoun extraction	OBJ_C1:OBJ_C2	MS (random effect)
	OBJ_C2	OBJ_C1:OBJ_C2:VARIETY
		OBJ_C1:VARIETY
		OBJ_C2:VARIETY
		VARIETY
		OBJ_C1

Details about the stepwise regressions and the results of the model testing processes are provided in the appendix, sections 5.1-5.3. In the following, each of the three experiments will be discussed in more detail: *that*-complementizers (5.1), asymmetric encoding (5.2) and object pronoun extraction (5.3). Each of these sections will begin with a brief overview of what the literature says about the respective phenomenon, along with hypotheses derived from previous claims and findings, both from the corpus study in chapter 4 and other studies. Subsequently, the final models determined by stepwise regression will be discussed, and a closer look at the data sets will be provided, including the fillers and test item ratings. Ratings will be compared within varieties (i.e., a variety-specific comparison of the different syntactic variables) and across varieties. Finally, the results will be discussed with regard to the significant predictors that were determined using the stepwise regression method.

5.1 *That*-complementizers

As the corpus study in chapter 4 revealed, *that*-complementizers in CCs are strongly disfavored in English, with very low frequencies across all investigated varieties. In the literature, however, the grammaticality of *that*-complementizers has been hotly debated (see the discussion in chapter 3). In summary, what the literature has to say about *that*-complementizers is that

- there is “a strong general preference for the absence of complementizers”, with previous corpus studies having found that structures with no overt *that*-complementizers (henceforth: \emptyset - \emptyset) are “[b]y far the most significantly associated pattern” (Hoffmann 2019: 126);

- structures with a *that*-complementizer in C1 only (henceforth: *that*– \emptyset) are grammatical (Borsley 2004: 73; den Dikken 2005: 502; Hoffmann 2019: 47), although some sources claim that as a remnant of earlier developmental stages of English, they are disfavored (Hoffmann 2019: 126; Hoffmann et al. 2020: 212);
- “colloquial Modern English licenses an optional *that* in both C1 and C2” (Hoffmann 2019: 74, who also refers to Borsley 2004: 73, Fillmore et al. 1988: 508). That is, *that*-complementizers in C2 only (henceforth: \emptyset –*that*) and in both C1 and C2 (henceforth: *that*–*that*) are not ungrammatical, but restricted to the colloquial register (Culicover and Jackendoff 1999: 546; den Dikken 2005: 502; Hoffmann 2019: 210).

It was therefore decided to create an experiment to test these claims in the literature about the grammaticality of *that*-complementizers in C1, C2, and in both clauses. The following hypotheses could thus be tested:

- Across all varieties, the combination with no overt *that*-complementizers (\emptyset – \emptyset) is clearly preferred over all others, based on the extremely low frequency of *that*-complementizers across all corpora (see section 4.1.1), confirming Hoffmann et al.’s claim that they are “no longer central properties of the English CC construction” (2020: 213), thereby “highlighting the more paratactic marking of C1 and C2” (2019: 208);
- as “a weak indication that C1 used to be syntactically subordinate to C2” (Hoffmann 2019: 210), in the ‘conservative’ stage V varieties AmE and White South African English (WSAfE), *that*-complementizers in C1 (*that*– \emptyset) receive better ratings than in the lower-stage varieties Coloured South African English (CSAfE) (IV), Black South African English (BSAfE) (IV), Singapore English (SingE) (IV) and Kenyan English (KenE) (III). This reflects findings from the corpus study in chapter 4, which revealed that the absence of C1 *that*-complementizers showed a strong attraction to stage III varieties, as well as findings from earlier studies, e.g. Hoffmann’s ICE corpus investigation, in which he found “a slight dispreference for C1s without a *that*-complementizer in Stage V varieties” (2019: 210);
- the ‘symmetric’ variant with *that*-complementizers in C1 and C2 (henceforth: *that*–*that*) is preferred over the asymmetric ones (i.e., *that*– \emptyset and \emptyset –*that*), particularly in the stage III and IV varieties, indicating that “Stage IV and III L2 varieties exhibit an even stronger paratactic relationship [than stage V varieties] between C1 and C2” (Hoffmann 2019: 210);
- reflecting claims that it is “unlikely that these structures are entrenched in large parts of the population” and that they “are analogically formed on the few C1 clauses with a *that*-complementizer” (Hoffmann 2019: 212), C2 *that*-complementizers are generally dispreferred;
- in the context of Mesthrie’s ‘deleters and preservers’ theory (2006, 2008a, 2012, cf. also Mesthrie and Bhatt 2008), speakers of African varieties rate structures with overt *that*-complementizers better than speakers of Asian varieties;
- or, in line with Kortmann’s hypothesis about an L1–L2 continuum (2014) ranging from ‘deleters’ to ‘preservers’, *that*-complementizers are rated better by speakers of ‘preserving’ L1 varieties (i.e., AmE and WSAfE) and worse by speakers of ‘deleting’ L2 varieties (i.e., CSAfE, BSAfE, SingE, and KenE);

- in the context of the Dynamic Model, lower-stage varieties and particularly stage III varieties are more innovative in the use of *that*-complementizers, deviating from the Standard English varieties.

The experiment was designed to cross the following two factors with two levels each:

- THAT-COMPLEMENTIZER C1 (levels: THAT, NO THAT)
- THAT-COMPLEMENTIZER C2 (levels: THAT, NO THAT)

Taking into account all possible factor combinations resulted in $2 \times 2 = 4$ cells. Following the methodology suggested by Cowart (1997: 49-50, as cited by Hoffmann 2011: 176), the aim was to present to every participant all four of these conditions but use different lexical material each time. In other words, this ensures that “the informant is never able to confront a sentence in quite the same way twice” (Cowart 1997: 50). Thus, four different lexicalizations had to be created. Because of this low number of lexicalizations, it was decided to create two lexicalizations for each condition, resulting in eight test items in total. The lexicalizations, some of which were based on corpus tokens, are listed in (5.1):

(5.1) THAT-COMPLEMENTIZER lexicalizations

- The more (that) he says, the less (that) I want to say.*
- The less (that) you practice, the more (that) you struggle.*
- The more (that) he is encouraged, the better (that) he performs.*
- The more (that) you trade, the more (that) you pay taxes.*
- The faster (that) you work, the sooner (that) you finish.*
- The more (that) I looked, the less (that) I was able to see.*
- The less (that) you smoke, the longer (that) you live.*
- The farther (that) I went, the darker (that) things got.*

The above sentences were then used to create all four factor combinations (THAT_{C1}-THAT_{C2}; THAT_{C1}-NO THAT_{C2}; NO THAT_{C1}-THAT_{C2}; NO THAT_{C1}-NO THAT_{C2}) twice, resulting in $8 \times 4 = 32$ tokens. These were then divided into four material sets of eight tokens each using the Latin squares method as recommended by Hoffmann (2011: 29, who refers to Keller 2000: 60; Keller and Alexopoulou 2005: 1121 in this regard), with the aim of presenting every factor combination to every participant twice, but without using the same lexicalization (5.2a-h) more than once in every material set. Thus, material set 1 looked as follows (5.2a-h)² (the complete material sets, including all filler items, are available on the research project’s OSF repository):

(5.2) THAT-complementizers, Material set 1

- The more **that** he says, the less **that** I want to say.*
- The less **that** you practice, the more you struggle.*
- The more he is encouraged, the better **that** he performs.*
- The more you trade, the more you pay taxes.*
- The faster **that** you work, the sooner **that** you finish.*
- The more **that** I looked, the less I was able to see.*
- The less you smoke, the longer **that** you live.*

2 The *that*-complementizers are in bold only here for illustrative purposes. In the actual experiments, no bold or highlighting of any other sorts was employed. The same applies to the fillers and other experimental items discussed in sections 5.2 and 5.3.

h. *The farther I went, the darker things got.*

In addition to these eight test items, 16 filler items were created to achieve a filler:stimuli ratio of 2:1³, following Cowart's suggestion that "[i]n general, there should be at least twice as many filler sentences as there are [test items]" (1997: 92). As Cowart (1997: 92-93) explains, this is done because when

the ratio of fillers to [test items] goes to two or below, there is an increasing danger that informants will become particularly aware of the sentence types the experiment features, with unpredictable consequences for the informants' patterns of response.

The filler items were conditional sentences based on four different patterns: AS (5.3a), IF (5.3b), WHEN (5.3c), and WITH (5.3d):

(5.3) **Filler item patterns**

- a. *As more documents are discovered, the more we find out.*
- b. *If you have a newer version, the better.*
- c. *When people care more, the world will become better.*
- d. *With more work, you will be more stressed.*

For each of these patterns, two grammatical and two ungrammatical lexicalizations were created: half of the fillers were thus ungrammatical, with erroneous subject-verb agreement, i.e., the 3rd Ps. sg. -s was deliberately omitted (5.4a-d):

(5.4) **Examples of ungrammatical fillers**

- a. *As a man **grow** older, the wiser his thoughts.*
- b. *If Harry **study** harder, the better his grades.*
- c. *When my friend **live** closer, we can visit each other more.*
- d. *With less sleep, my friend **have** more concentration problems.*

The 16 fillers were added to the eight test items and the resulting set of 24 tokens was then randomized. Subsequently, four material sets, each consisting of 24 tokens, were created such that each material set featured the four possible factor combinations (i.e., \emptyset - \emptyset , *that*- \emptyset , \emptyset -*that* and *that*-*that*) with different lexicalizations and in different places in the questionnaire⁴. Note that in each of the sections below, before discussing the test items the filler items will be examined in detail. This is necessary because the test items will be compared against the means of the ungrammatical and grammatical fillers. The variance of ratings of the individual fillers thus had implications for the validity of this 'yardstick' that will serve to determine the degree of acceptability (and thus, entrenchment) of the test items. As will be shown, in each of the three experiments – *that*-complementizers (5.1), asymmetric encoding (5.2), and object pronoun extraction (5.3) – at least one filler had to be excluded from the subsequent analyses because they were not rated as expected.

For the first experiment (*that*-complementizers), 192 participants were recruited as follows:

- University of Texas at Austin: 38 participants (17 female, 20 male, 1 non-binary; age 18-26);
- University of Cape Town: 96 participants from the following sub-varieties:
 - 18 WSAfE speakers (14 female, 4 male; age 18-23)

3 Note that the minimum ratio of 2:1 (and not a larger one) was used in order to avoid "an unreasonably long questionnaire" (Cowart 1997: 92).

4 Due to human error, the questionnaires testing *that*-complementizers in Austin featured the same lexicalizations (but not factor combinations) in the same order for all material sets. This was remedied in the remaining experiments.

- 49 CSAfE speakers (36 female, 13 male; age 18-23)
- 18 BSAfE speakers (15 female, 3 male; age 18-40⁵)
- 2 SA Indian South African English (IndSAfE) speakers (1 female, 1 male, age 19 and 21)
- 1 L1 Afrikaans speaker who identified as ‘White South African’ (female, age 20)
- 8 who indicated otherwise (e.g. ‘international’, ‘other’);
- National University of Singapore: 31 participants (22 female, 9 male; age 19-24);
- University of Nairobi: 38 participants (19 female, 19 male; age 20-30).

Table 5.2 shows how many of each of the four material sets were filled out per variety; as can be seen, the goal of recruiting at least eight participants per material set per variety could not be achieved regarding Singapore and the South African sub-varieties (for a detailed discussion of the sampling strategy in South Africa, which complicated matters even further, see section 5.1.2 below). This was, however, due to circumstances beyond the control of the author: In contrast to online experiments (cf. e.g. Hoffmann 2011), where one can simply wait until a sufficient amount of participants has filled out a certain material set, only a limited amount of time was available at each location to carry out the on-site experiments. This meant that there was the possibility of simply not being able to recruit enough participants, registered participants not showing up, or participants’ questionnaires having to be excluded from analysis because they were not representative of the variety (e.g. one participant in Singapore who turned out to be an Italian exchange student).

Table 5.2 Number of material sets (MS) filled out in each variety, with DM stage in brackets (that-complementizer experiment)

	MS 1	MS 2	MS 3	MS 4	Total
AmE (V)	10	9	9	10	38
WSAfE (V)	3	7	6	2	18
SingE (IV)	9	7	9	6	31
CSAfE (IV)	12	12	12	13	49
BSAfE (IV)	7	3	3	5	18
KenE (III)	9	10	9	10	38
Total	50	48	48	46	192

As Table 5.3 shows, the statistical analysis with the stepwise regression method using *lmerTest* (see section 2.1.2.1; results provided in appendix 5.1) resulted in two random effects that were not significant, SUBJECT and material set (MS)⁶. In other words, these two random effects did not influence the dependent variable (i.e., participants’ ratings) in any significant way, so that they could be eliminated from the model. However, the random effect LEXICALIZATION did turn out to be very significant ($p=0.000001541^{***}$) and had to be retained in the final model.

5 One participant aged 40, the remaining between 18-23.

6 Although note that the random effect SUBJECT has a p -value very close to the significance threshold of 0.05.

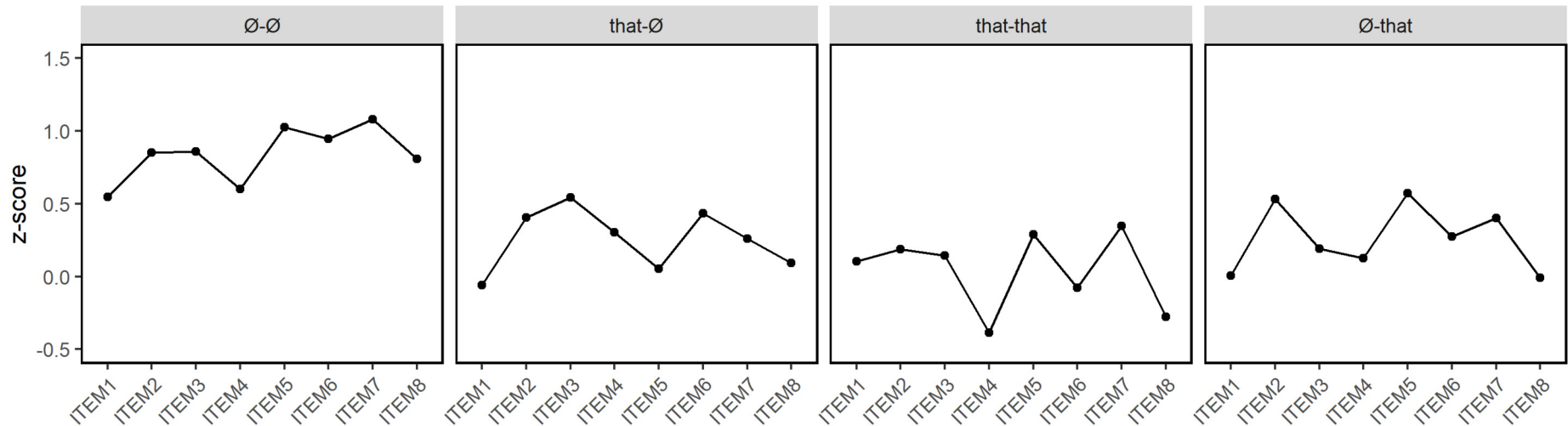


Figure 5.1 Z-score ratings of test item lexicalizations grouped by factor combinations, all varieties (that-complementizer experiment)

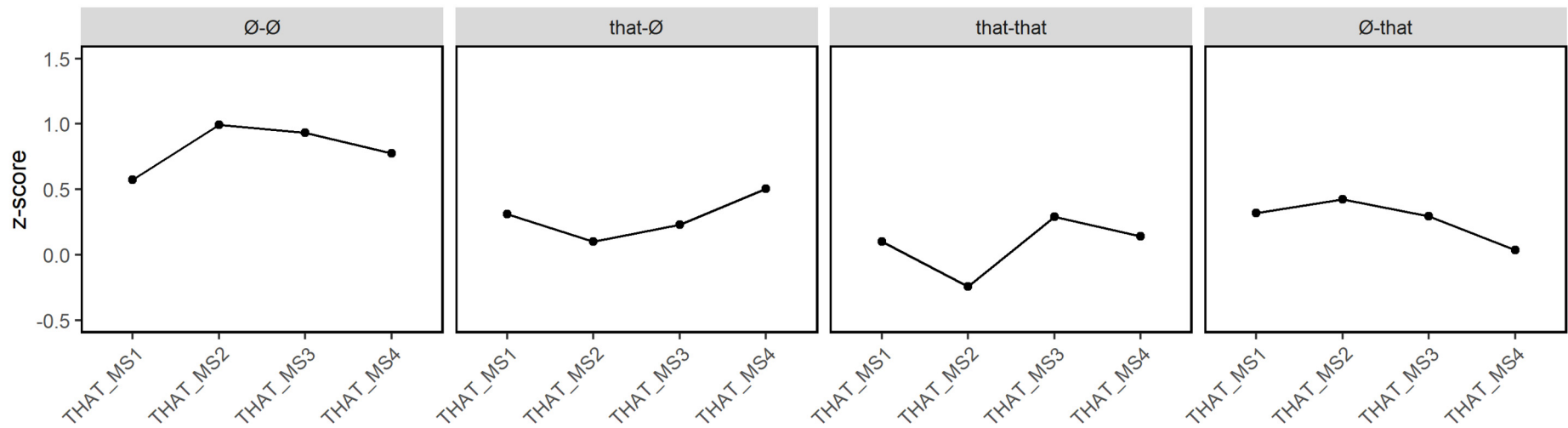


Figure 5.2 Z-score ratings of material sets grouped by factor combinations, all varieties (that-complementizer experiment)

The significance of the random effect LEXICALIZATION is also evident from Figure 5.1, which shows that test items were not rated very consistently (although note that there is a clear preference for the combination without *that*-complementizers (\emptyset – \emptyset), a point that will be discussed in more detail below). For comparison, Figure 5.2 shows the considerably more consistent ratings regarding the random effect MS (material set), which was not significant.

Table 5.3 Likelihood ratio tests for random effects, and their order of elimination (that-complementizer experiment)

	χ^2	Elimination no.	<i>p</i> -value
MS	0.44	1	0.50481 n.s.
SUBJECT	3.81	2	0.05085 n.s.
LEXICALIZATION	23.10	kept	<0.001***

The reasons why the test items should have been rated so inconsistently are difficult to determine at this point, but one possibility is that participants rated the test items not only in terms of grammaticality (as they had been explicitly instructed to do) but also the semantic content of the items. In any case, the retention of this highly significant random effect in the model means that discussions of the results in sections 5.1.1-5.1.5 have to be taken with a grain of salt. Together with the random effect LEXICALIZATION, the fixed effects that Table 5.4 below indicates as having been kept in the model (i.e., not eliminated) are “the ones that form the simplest plausible model” (Kuznetsova et al. 2015: 34). This “parsimonious model” (Kuznetsova et al. 2015: 34) illustrates the importance of a sophisticated statistical analysis of the MET data: First, it could be demonstrated that the experimental design was partially successful in that neither SUBJECT nor MS had a significant effect on ratings and second, two complex interactions (see below) were found that would have gone unnoticed in a simple linear model. As Table 5.4 shows, all fixed effects turned out to be very significant.

Table 5.4 F-tests for the fixed effects, and their order of elimination (that-complementizer experiment)

	<i>F</i>	Elimination no.	<i>p</i> -value
THAT_C1:THAT_C2:VARIETY	1.12	1	0.34518 n.s.
THAT_C2:VARIETY	1.86	2	0.09797 n.s.
THAT_C1:THAT_C2	22.92	kept	<0.001***
THAT_C1:VARIETY	2.91	kept	0.01287*
THAT_C1	67.41	kept	<0.001***
THAT_C2	81.12	kept	<0.001***
VARIETY	6.09	kept	<0.001***

The same applies to two interactions: THAT_C1:THAT_C2 and THAT_C1:VARIETY. In other words, as the *p*-values indicate, all fixed effects as well as the interaction

THAT_C1:THAT_C2 (all $p < 0.001^{***}$) had a very strong influence on participants' ratings; furthermore the interaction THAT_C1:VARIETY was significant ($p = 0.01287^*$).

Finally, model testing revealed that the final model is able to account for the data very well: With an evidence ratio of roughly 1.448932×10^{32} , the evidence is overwhelmingly in favor of the better model (i.e., the final model) compared to the null model. The marginal and conditional R^2 values of the final model were 0.129 and 0.148, respectively, which is comparatively small – recall that “[l]arger residuals yield smaller R^2 values” (Winter 2020: 76). This suggests that the fixed effects that were determined as significant (cf. Table 5.4 above) only have a small influence on the dependent variable. As Laporte notes⁷, however, this is “not unexpected [...] as [...] different [syntactic] preferences between varieties, have been argued to necessarily be subtle in nature” (2019: 272, also referring to Mukherjee and Hoffmann 2006). This “ties in with the ‘core probabilistic grammar’ that Szmrecsányi et al. (2016) have identified for syntactic alternations by showing that the nativization effects are only small relative to the linguistic variables that predict the use of alternations” (Laporte 2019: 272).

In the following sections, the results obtained from each location are discussed in detail, in particular regarding the very significant interaction THAT_C1:THAT_C2: USA (5.1.1), South Africa (5.1.2), Singapore (5.1.3), and Kenya (5.1.4). Subsequently, results will be compared across varieties (5.1.5), with a focus on the significant interaction THAT_C1:VARIETY.

5.1.1 *That*-complementizers in American English

The pen-and paper experiments were conducted at the University of Texas at Austin on 18 and 19 September 2019 (for a more detailed account of the circumstances cf. section 2.1.2). Participants were recruited ahead of these dates with the help of local university staff⁸, who informed students about the experiments. Additionally, posters were put up on the university premises, and finally, participants who had already taken part were encouraged to inform other students by word of mouth. In total, 38 participants (17 female, 20 male, 1 non-binary, age 18-26) could thus be recruited for the first experiment.

Figure 5.3 shows the z-scores of each of the 16 fillers. Two general tendencies that also apply to the other varieties emerge: First, the ungrammatical fillers were rated more consistently than the grammatical fillers, as is evident from the medians, represented by the lines in the boxes, which are much closer to each other (minimum z-score (IF1 ungrammatical): -1.125 ; maximum z-score (WITH1 ungrammatical): -0.649) than those of the grammatical fillers (minimum z-score (IF1 grammatical): -0.667 ; maximum z-score (IF2 grammatical): 0.943). Furthermore, the ungrammatical fillers generally have smaller interquartile range boxes, which represent the middle 50% of the data. In other words, the ungrammatical fillers are characterized by smaller spreads, indicating less variable ratings than those of the grammatical ones. This is also evident from the whiskers, which represent

7 Incidentally, the R^2 values determined by Laporte in the context of her corpus study on the light verb construction (between 0.06 and 0.13) are very similar to the marginal and conditional R^2 values determined in the present study (0.129/0.148 (*that*-complementizers), 0.095/0.118 (asymmetric encoding), 0.060/0.083 (object pronoun extraction)).

8 I would like to thank Hans Boas from the University of Texas at Austin for his help in recruiting participants and arranging for the rooms in which the experiments took place.

the ranges of the bottom 25% and the top 25% of the data values (excluding outliers) and are also generally shorter than those of the grammatical fillers.

Also note that while all ungrammatical filler medians have negative z-scores, that is, they are located well to the left of the line that marks a z-score of 0, the medians of three out of eight grammatical fillers (WHEN2, AS2, and AS1) are very close to this mark, which also indicates that the grammatical fillers were not rated as consistently as the ungrammatical fillers.

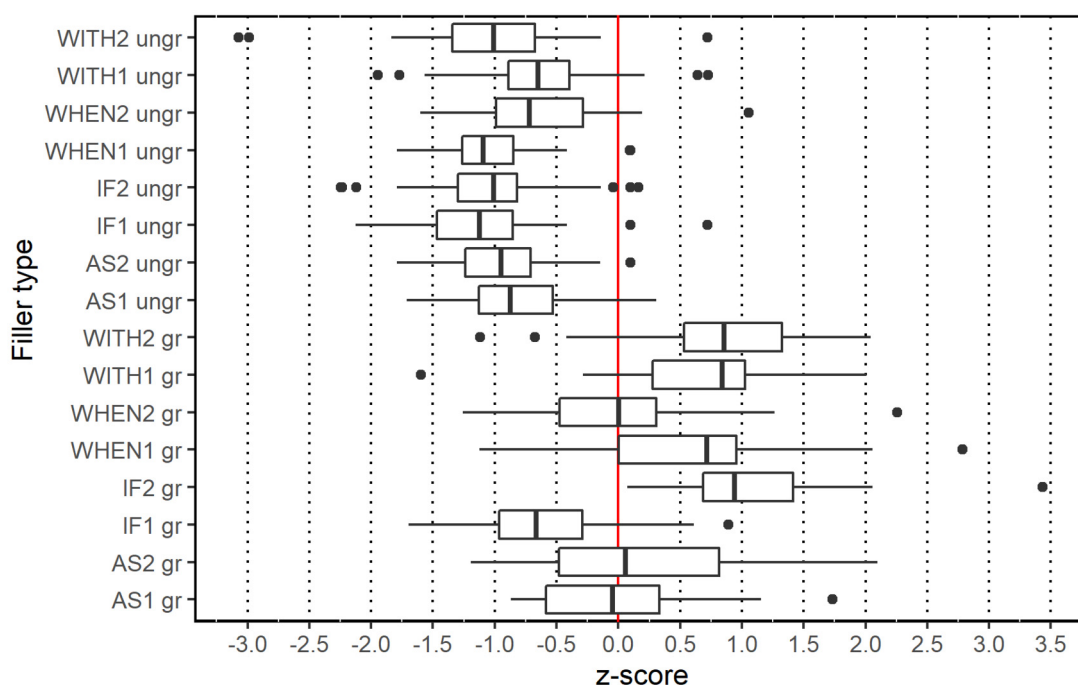


Figure 5.3 Z-scores of fillers (that-complementizer experiment), AmE (n=38)

In fact, IF1 grammatical (5.5a) turned out to be rated considerably worse than the other grammatical fillers (5.5b-c), with a z-score median of -0.667 , which is less than the ungrammatical filler that was rated highest, WITH1 ungrammatical (5.6), which had a z-score median of -0.649 . The reasons for this could have to do with the particular lexicalization of IF1, in which the second clause consists of *the* + comparative adverb only, whereas all other fillers featured either full clauses or at least a noun phrase (5.5b-d), making them longer.

- (5.5) a. *If you have a newer version, the better.* (IF1 gramm)
 b. *If there are more customers, then we will earn more.* (IF2 gramm)
 c. *If one speak more, the better the language.* (IF1 ungramm)
 d. *If Harry study harder, the better his grades.* (IF2 ungramm)
- (5.6) *With less sleep, my friend have more concentration problems.* (WITH1 ungramm)

For this reason, and to make the results more comparable in general, the grammatical filler IF1 (5.5a) was excluded from further analysis, which increased the overall grammatical filler mean (rendered as the upper horizontal line in Figure 5.4 below) from 0.329 to 0.436. This follows Hoffmann's approach, who noted that in METs "it needs to be ensured that it is the different kind of linguistic violation that gives rise to the difference [in rating] and not other

factors such as *the length of [...] sentences*” (Hoffmann 2013: 102, emphasis JH). The same was done with the other investigated varieties, where this particular filler was mostly rated worse than the other grammatical fillers.

Next, all grammatical fillers were collapsed to obtain the grammatical filler mean; the same was done for the ungrammatical fillers, yielding two means against which the test items could be compared. The grammatical filler mean was 0.436 with a SD of 0.807 and a SE of 0.049; the ungrammatical filler mean was -0.930 with a SD of 0.562 and a SE of 0.032. The difference between the ungrammatical and grammatical filler means was thus 1.366, which is very similar to that determined in the other two experiments (asymmetric encoding (cf. section 5.2.1): 1.316, object pronoun extraction (cf. section 5.3.1): 1.329). In fact, as will become apparent in the sections below, across all three experiments the variety-specific ungrammatical–grammatical filler means difference was quite constant, with very few exceptions. This proves reliability of the method of rating test items against ungrammatical and grammatical filler items.

Figure 5.4 shows the results of the first experiment in a plot that crosses the factors THAT_C1 and THAT_C2 (recall that the stepwise regression revealed the interaction THAT_C1:THAT_C2 to be very significant).

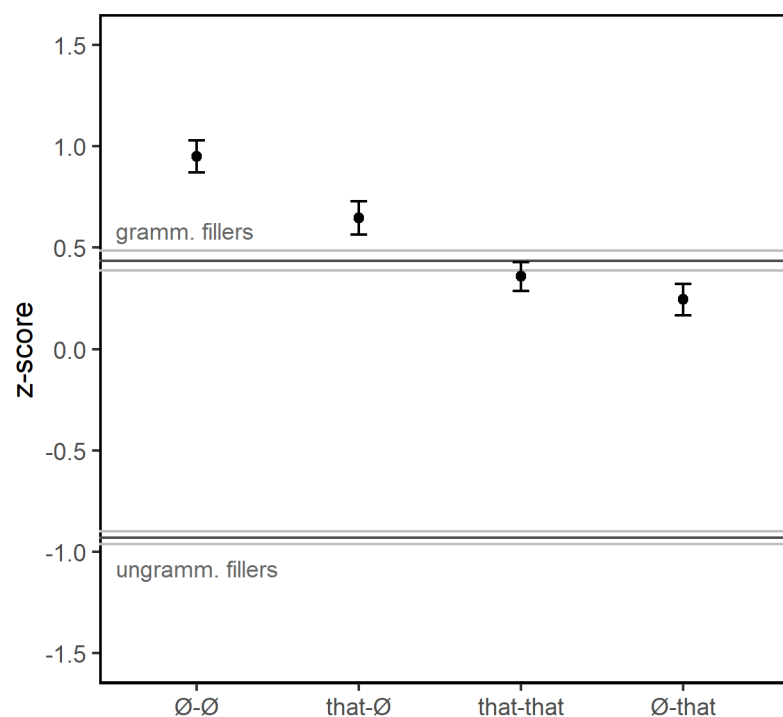


Figure 5.4 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (*that-complementizer experiment*), *AmE* ($n=38$)

Figure 5.4 shows that all *that*-complementizer combinations were judged as considerably better than the ungrammatical fillers. Two combinations, \emptyset – \emptyset (z-score mean: 0.949; SD: 0.691, SE: 0.079) and *that*– \emptyset (z-score mean: 0.647; SD: 0.647, SE: 0.082), were judged as better than the grammatical fillers (indicated by the dark gray horizontal lines; light gray lines

indicate standard errors). The combination *that*–*that* (z-score mean: 0.357; SD: 0.629, SE: 0.072) was judged just slightly worse than the grammatical fillers (z-score mean: 0.436), followed by \emptyset –*that* (z-score mean: 0.244; SD: 0.686, SE: 0.079).

This suggests that in general, *that*-complementizers were deemed acceptable in all possible combinations across C1 and C2. Those structures with no overt *that*-complementizers in either C1 or C2, however, were clearly rated best, in support of Hoffmann’s claim that “*that*-complementizers are generally disfavoured in CC constructions” (2019: 107). The second-best rated structure is that with a *that*-complementizer in C1 only, which did not get a score as high as the structure without *that*-complementizers but was nevertheless clearly rated better than the remaining two options. This is in line with what was expected, since *that*-complementizers in C1 were historically used as a marker of this clause as subordinate (as discussed in section 3.1.1), and it offers an explanation of why in introspective studies (e.g. den Dikken 2005; Culicover and Jackendoff 1999), this feature is described as grammatical. However, the fact that the structure without any *that*-complementizers is clearly preferred lends further support to the conclusion drawn from the corpus data analysis (see section 4.1.1): *That*-complementizers in C1 are a diachronic remnant that is no longer a central property of PdE CCs.

Overall, the MET results obtained from the American participants thus reflect what was expected: The symmetric structure with no *that*-complementizers was rated best, providing further evidence in favor of a paratactic analysis of standard, or prototypical English CCs; the structure with a *that*-complementizer in C1 was rated second-best, which corresponds to the prediction that as a historical remnant, it is not entirely ungrammatical, but nevertheless dispreferred (versus \emptyset – \emptyset). The structure with *that*-complementizers in both C1 and C2 was rated worse than the grammatical fillers, but better than that with a *that*-complementizer in C2, reflecting the findings from the corpus study, where only very few such parallel structures and none with *that*-complementizer in C2 only could be found.

5.1.2 *That*-complementizers in South African English

Further pen-and paper experiments were conducted at the University of Cape Town on 8 and 9 October 2019. As was the case in Austin, participants were recruited with the assistance of local university staff⁹, who recruited students in the weeks ahead of the experiments. Furthermore, once participants had taken part, they were encouraged to inform other students by word of mouth, a strategy that had proved successful in Austin. Because ethnicity is a sensitive and complex issue in South Africa, it was decided to recruit not only speakers of WSAfE, but rather, three times as many participants as in the other locations, with the goal of obtaining results from a comparable number of WSAfE speakers. This approach was based on official student enrollment numbers¹⁰, which suggested that in 2014 (the last time such statistics were published), roughly one third (8,093 out of 26,357) of students at the University of Cape Town identified as ‘white’. Additionally, this broader sampling strategy allowed for the investigation of two other South African varieties: Black South African

9 I am very grateful to Rajend Mesthrie from the University of Cape Town and his student assistants Beth Horn and Fatima Sadan for their assistance in carrying out the experiments.

10 Enrollment numbers were obtained from <http://www.uct.ac.za/about/intro/statistics/> (accessed 26 February 2017).

English (BSAfE) and what e.g. Mesthrie (2014: 59) refers to as “Coloured¹¹ English” (referred to as CSAfE in the following, but also known as ‘Cape Flats English’).

Before beginning with a discussion of the MET results, it is necessary to briefly elaborate on how the South African varieties were classified regarding Dynamic Model stages. While there appears to be a consensus in the literature that overall, South African English (SAfE) should be classified as a stage IV variety (Schneider 2014: 14; who refers to Spencer 2011a: 270; van Rooy and Terblanche 2010: 407; see also Hickey, who speaks of an “endonormative reorientation of English in South Africa” (2020: 7)), it is a well-known fact that because of its “unique profile within the constellation of Southern Hemisphere Englishes” (Hickey 2020: 6), in the case of SAfE “it is not justified to talk of a single, stabilized variety” (Schneider 2007: 188). Rather, to use Schneider’s words, there are several “sub-varieties” (2014: 13; 2020: 17) that have evolved at different speeds and under different conditions due to the “complex ethnic and linguistic composition” in South Africa (Hickey 2020: 3) and the resulting input situation that is so characteristic of SAfE (for an overview, see Schneider 2007: 173-188). Thus, Schneider concludes, there are several “distinct ethnic varieties of South African English [that] should perhaps be dealt with independently of each other” (Schneider 2020: 21).

It is no surprise, then, that “South Africa offers an ecological [linguistic] complexity” (Mesthrie 2014: 58) that poses a “unique challenge” to World Englishes models (Schneider 2020: 17). It is even less surprising that when it comes to the individual ethnic varieties (i.e., sub-varieties of SAfE), there is little agreement in the literature about which DM stage(s) they should be assigned to. Bekker, for example, finds that it is unclear whether BSAfE “has come close to completing [stage] III” (2009: 86), while Spencer claims that “there is some movement of the variety towards Schneider’s Phase 4” (2011b: 133, as noted by Schneider 2014: 14). Similarly, Makalela notes a “progression towards Schneider’s endonormative phase [i.e., stage IV] in post-Independence South Africa” (2013: 105), and, referring to van Rooy and Terblanche (2010), writes of “a continuum of [BSAfE] between nativization and endonormative phases” (2013: 104).

Regarding CSAfE, van Rooy notes that a “distinctive form of English stabilised and gained informal acceptance in the coloured community, and [...] displayed many of the characteristics Schneider (2007: 48–52) associates with Phase 4” (2014: 29). In the same vein, du Plessis claims that CSAfE has “reached at least phase 4” of the Dynamic Model (2015: 51). WSAfE, which is the only L1 variety in South Africa (as noted by e.g. Mesthrie 2014: 59; Bowerman 2014: 472; Schneider 2020: 17), has been described as having “reached a stage of endonormative orientation” (Bekker 2009: 103), having developed “far into Phase 4” (Bekker 2009: 432). However, it has also been noted that WSAfE, which “differs little superficially from other [L1] varieties” regarding syntax (Bowerman 2008: 472), “seems to be at phase 5” of the DM (du Plessis 2015: 51), and has been treated as such in recent corpus studies (Brunner and Hoffmann 2020: 3). Evidence for a stage V classification, i.e., differentiation, mostly comes from phonological studies, e.g. Mesthrie et al., who noted that

11 It is acknowledged that “[t]he use of the term ‘Coloured’ as an ethnonym in the South African context is often perceived as problematic” (du Plessis 2015: 33). The same applies to ‘White’ and ‘Black’. However, currently there is no practical alternative to describing the “five major varieties definable largely by ethnicity” in South Africa (Mesthrie 2014: 59), so that these terms will nevertheless be employed in the following.

regarding the BATH vowel, “[s]ome differentiation occurs among Whites” (2015: 26, as noted by du Plessis 2015: 51), which would be characteristic of stage V (differentiation). All things considered, it therefore seemed most appropriate to categorize the South African varieties as stage V (WSAfE) and stage IV (CSAfE and BSAfE), although it is acknowledged that BSAfE does not appear to have fully completed the progression into stage IV yet.

In total, 96 subjects participated in the experiment. Of these, 18 (14 female, 4 male; age 18-23) indicated that they identified as ‘South African White’ and that they predominantly spoke English with their parents and friends, so that they were assigned to the WSAfE group. Furthermore, 49 participants (36 female, 13 male; age 18-23) indicated that they identified as ‘South African Coloured’, and 18 as ‘South African African’. Only two participants indicated that they identified as “SA Indian”, and 8 speakers indicated otherwise (e.g. “international”, “other”). These were omitted, as they were too few and too heterogeneous to be included in the analysis. The same applied to the only subject (female, age 20) who indicated that she identified as ‘South African White’ and only spoke Afrikaans with her parents, i.e., who cannot be assumed to be an L1 English speaker (WSAfE is considered an L1 variety in the present study). In the following, the results for WSAfE (section 5.1.2.1), CSAfE (section 5.1.2.2) and BSAfE (section 5.1.2.3) will be presented.

5.1.2.1 *That*-complementizers in White South African English

Those respondents who indicated that they identified as ‘South African White’ and that they were not L1 Afrikaans speakers¹² (i.e., all but one) were assumed to be speakers of what in the literature is commonly referred to as “White SAfE” (e.g. Bowerman 2008, Mesthrie 2014). As was done with the data sets from Austin, the grammatical and ungrammatical fillers were investigated first. Figure 5.5 shows the z-scores of the 16 fillers, revealing patterns similar to those in the American data set (see section 5.2.1.1): Again, the ungrammatical fillers were rated more consistently, with their medians closer to each other (minimum (WITH2 ungrammatical): -1.038; maximum (WHEN2 ungrammatical): -0.615) than those of the grammatical fillers (minimum (IF1 grammatical): -0.589; maximum (WHEN1 grammatical): 1.116). Also, the interquartile range boxes of the ungrammatical fillers are generally smaller, a further indication of smaller spreads and thus, less variance in rating.

As was the case with the American MET results, the median of filler IF1 grammatical (z-score: -0.589) is well below that of the other grammatical fillers, further justifying the exclusion of this particular item from analysis. In the case of the WSAfE data, this increased the overall grammatical filler mean from 0.328 to 0.455 with a SD of 0.779 and a SE of 0.069; the ungrammatical filler mean was -0.822 with a SD of 0.569 and a SE of 0.047. The difference between the ungrammatical and grammatical filler means was thus 1.277, similar to AmE (1.366). Again, this difference was also very similar across experiments (asymmetric encoding (section 5.2.2.1): 1.422, object extraction (section 5.3.2.1): 1.263), underscoring the reliability of the method (see discussion in section 5.1.1 above).

After collapsing the fillers to obtain the grammatical and ungrammatical filler means, the test items were plotted. Figure 5.6 shows the results, with many similarities to the American data set emerging: First, all combinations were rated considerably better than the

12 This was determined by looking at what the respondents indicated on the questionnaires regarding the language(s) their parents use to speak to each other and with the respondent. The one respondent who was dropped from analysis indicated “Afrikaans” only in both cases.

ungrammatical fillers, indicating that none of them were perceived as ungrammatical. Also, the structure without *that*-complementizers (\emptyset - \emptyset) was clearly rated the best, with a z-score mean of 1.150 (SD: 0.939, SE: 0.157), and it was rated considerably better than the grammatical fillers (z-score difference: 0.690). In fact, the difference between the variant with no *that*-complementizers and the grammatical fillers was more pronounced than in AmE (z-score difference: 0.302). The second-best rated structure was *that*- \emptyset with a z-score mean of 0.418 (SD: 0.701, SE: 0.117), which is just under the grammatical filler mean.

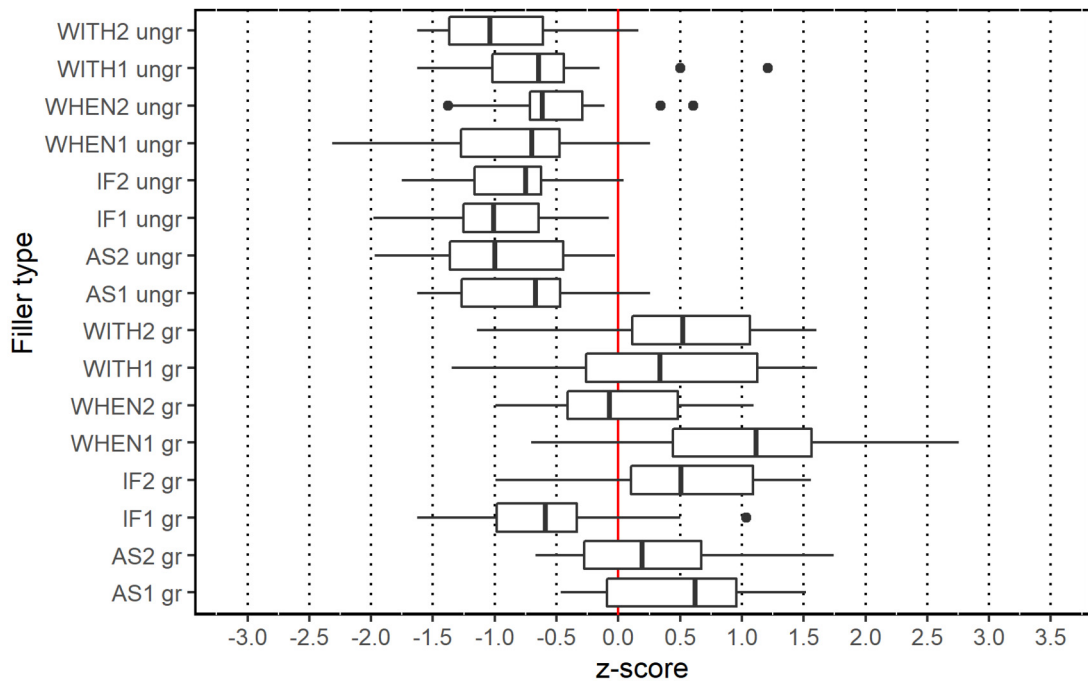


Figure 5.5 Z-scores of fillers (*that*-complementizer experiment), White SAfE ($n=18$)

In contrast to the AmE data set, the third-best rated structure was \emptyset -*that*, with a z-score mean of 0.332 (SD: 0.915, SE: 0.152); the option with two *that*-complementizers (i.e., *that*-*that*) was rated lowest, with a z-score mean of 0.076 (SD: 0.763, SE: 0.127). The standard errors were larger than in the AmE data set, as is evident from the longer test item error bars. This can be attributed to the smaller sample size ($n=18$), which was only about half as large as that of the AmE data ($n=38$). The results from the WSAfE data thus further support the claim that PdE CCs are more paratactic than hypotactic, and that *that*-complementizers in C1 are a historical remnant that is not ungrammatical but clearly dispreferred. Note that \emptyset -*that* was rated better than *that*-*that*, a pattern that also emerged in the other two South African varieties (see sections 5.1.2.2 and 5.1.2.3 below) – a point that will be further discussed in section 5.1.5.

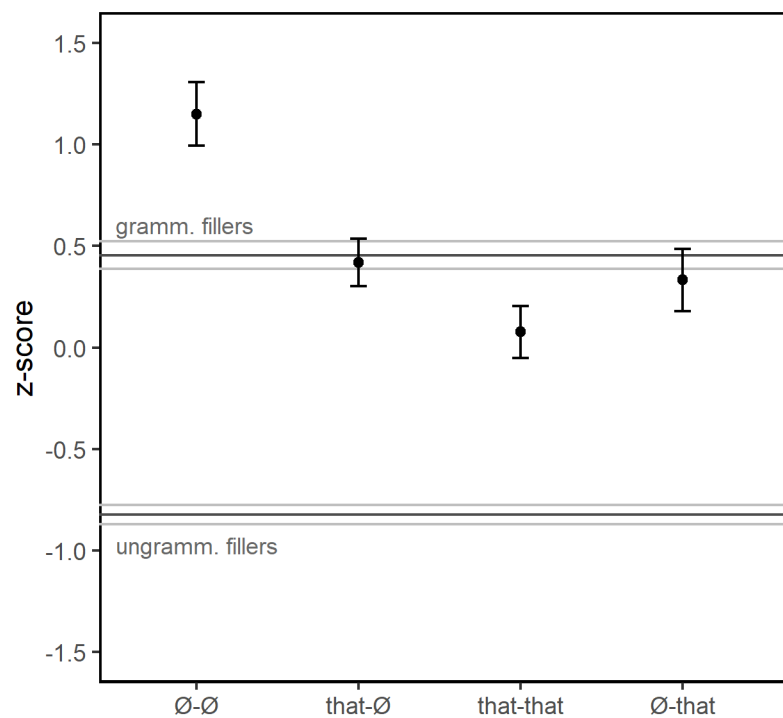


Figure 5.6 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (*that-complementizer experiment*), White SAfE ($n=18$)

5.1.2.2 *That-complementizers in Coloured South African English*

Figure 5.7 shows that the 49 respondents who identified as ‘South African Coloured’ generally rated the ungrammatical fillers as more acceptable than those respondents who identified as ‘South African White’, leading to a less pronounced difference (z-score: 1.084; for comparison: AmE: 1.367; WSAfE: 1.277) between the ungrammatical (z-score: -0.647) and grammatical (z-score: 0.437) filler means. Again, filler IF1 grammatical was rated considerably worse (z-score: -0.308) than the other grammatical fillers. Also, Figure 5.7 shows that as was the case with AmE and WSAfE, the ungrammatical fillers were judged more consistently (lowest z-score median (WITH2 ungrammatical): -1.223 ; highest z-score median (AS2 ungrammatical): -0.402) than the grammatical fillers (lowest z-score median (IF1 grammatical): -0.310 ; highest z-score median (IF2 grammatical): 0.735).

Note that in the South African Coloured group, the interquartile range boxes and the whiskers have a considerably larger span than in the AmE and WSAfE data sets, indicating more variance in respondents’ judgments. After collapsing the ungrammatical and grammatical fillers, the test items were plotted. The grammatical filler mean (z-score: 0.437) was exactly the same as in the American data set (z-score: 0.436) and very similar to its counterpart in the WSAfE data set (z-score: 0.455), with a SD of 0.851 and a SE of 0.046 ; the ungrammatical filler mean was -0.647 with a SD of 0.802 and a SE of 0.041 . The difference between the ungrammatical and grammatical filler means was 1.084 , slightly less than AmE (1.366) and WSAfE (1.277). As was the case with these two varieties, this difference in the

CSAfE data set was very similar across experiments (asymmetric encoding (section 5.2.2.2): 1.139, object extraction (section 5.3.2.2): 0.925), proving the reliability of the method (see discussion in section 5.1.1 above).

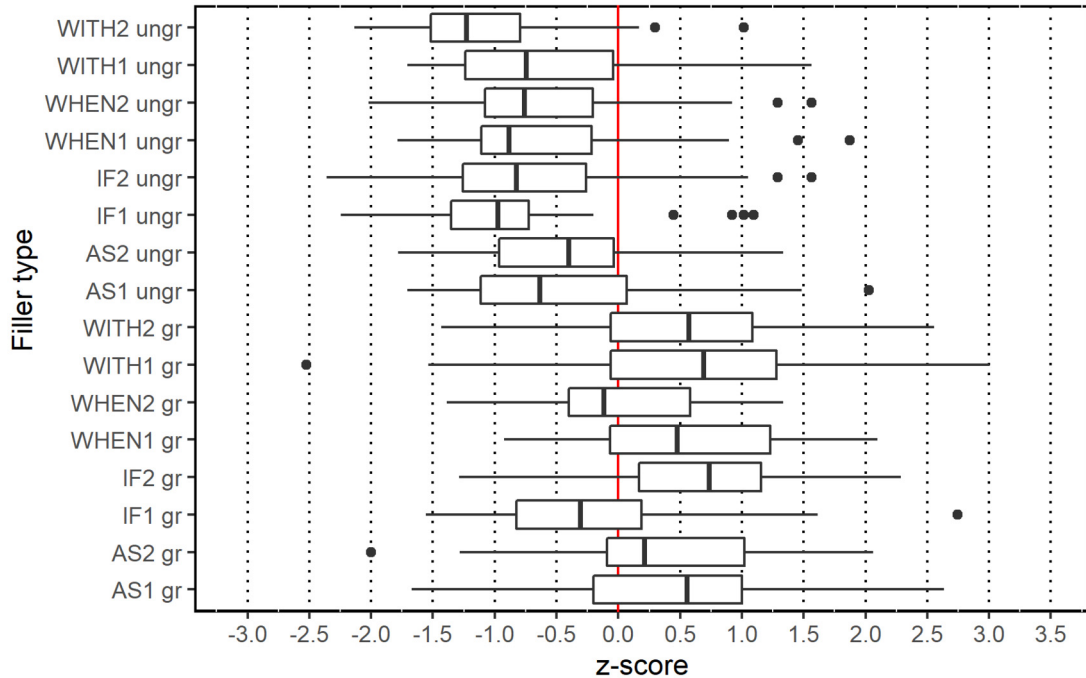


Figure 5.7 Z-scores of fillers (*that-complementizer experiment*), CSAfE ($n=49$)

The test items are plotted in Figure 5.8. Note that the error bars are shorter than those of WSAfE, indicating smaller standard errors (maximum: 0.103 (\emptyset -*that*); minimum: 0.074 (*that*-*that*)). This can be attributed to the considerably larger sample size ($n=49$) compared to the WSAfE data set ($n=18$). As was the case with AmE and WSAfE, all variations of *that*-complementizers across C1 and C2 were rated better than the ungrammatical fillers.

Furthermore, there is a pattern that reflects that of WSAfE: The combination without *that*-complementizers (\emptyset - \emptyset) was clearly rated best (z-score: 0.684; SD: 0.939, SE: 0.095), although there is a less pronounced z-score difference of 0.247 between it and the grammatical fillers (z-score: 0.437; difference in WSAfE: 0.690). The combination with a *that*-complementizer in C1 (*that*- \emptyset) was rated second-best (z-score: 0.238; SD: 0.842, SE: 0.085), but clearly worse than the grammatical fillers. \emptyset -*that* was rated slightly better (z-score: 0.212; SD: 1.015, SE: 0.103) than *that*-*that* (z-score: 0.020; SD: 0.736, SE: 0.074). However, in contrast to WSAfE (and AmE for that matter), all combinations with an overt *that*-complementizer (i.e., *that*- \emptyset , \emptyset -*that*, *that*-*that*) were clearly rated worse than the grammatical fillers, indicating a more pronounced dispreference of *that*-complementizers in general. Also, the difference of 0.664 between the best rated test item (\emptyset - \emptyset) and the lowest rated test item (*that*-*that*) was smaller than in WSAfE (1.073). In other words, respondents did not distinguish as clearly between the various uses of *that*-complementizers, i.e., it appears that they play a less important role in these speakers' mental networks, and are

therefore less entrenched in general. This is an observation that was also made in the BSAfE data set (see section 5.1.2.3 below).

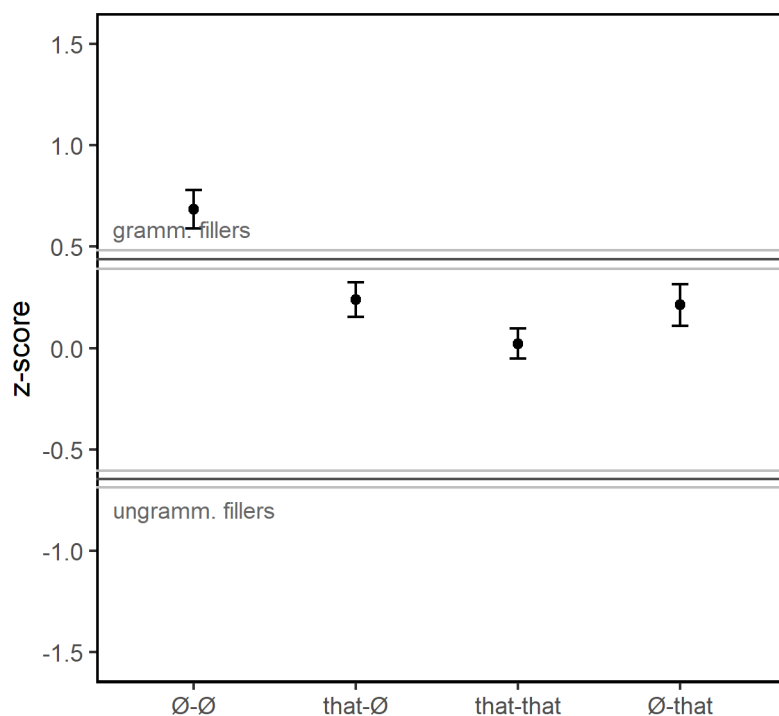


Figure 5.8 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (that-complementizer experiment), CSAfE ($n=49$)

The MET results obtained from the CSAfE respondents thus mostly correspond to the results from the WSAfE group, although they differ in two important respects: First, differences in rating between test items were less pronounced and second, while the variant with no overt *that*-complementizers (\emptyset - \emptyset) was rated best, this was not as clear as in the AmE and WSAfE data sets.

5.1.2.3 *That*-complementizers in Black South African English

Those respondents who indicated that they identified as ‘South African African’ were assumed to be speakers of the sub-variety that the literature commonly refers to as “Black SAfE” (BSAfE) (e.g. Mesthrie 2006; 2008b; 2012). A look at the individual fillers in Figure 5.9 reveals that much like the respondents who identified as ‘Coloured’, the ratings were less consistent with regard to the grammatical fillers, with large boxes and whiskers protruding from them.

Additionally, not only do three grammatical fillers have negative z-scores, the difference between grammatical and ungrammatical fillers also is less pronounced than in the AmE and WSAfE data sets. This is evident from the smaller difference (0.931) between the means of the collapsed grammatical (z-score: 0.338) and ungrammatical (z-score: -0.593) fillers. Note that again (cf. discussion in section 5.1.1), this difference between the ungrammatical and

grammatical filler means is relatively stable across experiments (asymmetric encoding: 0.891, object pronoun extraction: 0.862).

One reason for the less pronounced ungrammatical–grammatical filler difference could be that the ungrammatical fillers featured erroneous subject-verb agreement (see section 5.1) where the 3rd Ps. sg. *-s* was deliberately omitted. However, as Mesthrie notes, “Subject-verb concord for third person singular is variable between *-s* and \emptyset ” in BSAfE (2008b: 496) so that it is possible that the BSAfE speakers simply were less sensitive to the difference between grammatical and ungrammatical fillers, resulting in a less pronounced difference in rating (a similar effect might have influenced the rating of fillers in Singapore and Kenya, see sections 5.1.3 and 5.1.4 below). Unfortunately, this was not considered during the design phase of the questionnaires, but it will definitely have to be taken into account in the future studies.

The smaller difference between ungrammatical and grammatical fillers in the BSAfE data (and in the other varieties affected by this issue, i.e., SingE and KenE) means that the analysis in the following is not fully comparable to those varieties in which it was more pronounced. Recall that the grammatical and ungrammatical filler means are used to determine degrees of grammaticality and thus, entrenchment, of the test items. However, these filler means are skewed in the BSAfE data, so that e.g. a test item with a z-score mean well above the grammatical filler line might actually be located much closer to or even below this line if a different, more comparable filler design had been used.

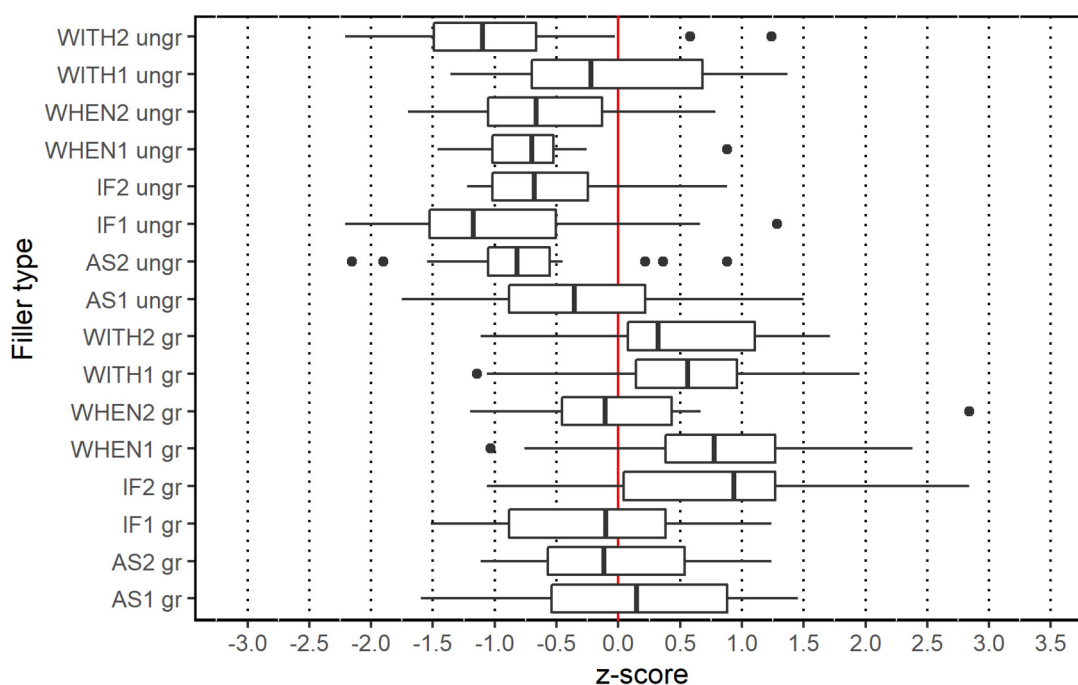


Figure 5.9 Z-scores of fillers (that-complementizer experiment), BSAfE ($n=18$)

Also note that unlike in the other varieties discussed so far, grammatical filler IF1 does not deviate considerably from the other grammatical fillers. Nevertheless, it was excluded from further analysis in the interest of comparable analyses between varieties. Removing this filler resulted in the overall grammatical filler mean increasing only slightly from 0.283 to 0.338.

After the fillers were collapsed, the test items were plotted. The grammatical filler mean (z-score: 0.338) was lower than in the AmE and CSAfE data sets (z-scores: 0.436) and the WSAfE data set (z-score: 0.455), with a SD of 0.902 and a SE of 0.080; the ungrammatical filler mean was -0.593 with a SD of 0.800 and a SE of 0.067.

The results of the test items are shown in Figure 5.10. The large error bars, indicating standard errors between 0.145 (\emptyset – \emptyset) and 0.169 (*that*–*that*) indicate that ratings were more variable than in the WSAfE and “Coloured” groups; an inspection of the data revealed no outliers. As in the other varieties, all combinations were rated better than the ungrammatical fillers, although there are some notable differences to the AmE, WSAfE, and CSAfE data sets. First, even though the variant with no overt *that*-complementizers (\emptyset – \emptyset) was rated best by the respondents, overall it was rated worse than in the other varieties discussed so far, with a z-score of 0.499 (SE: 0.872, SD: 0.146) and thus, a less pronounced difference of just 0.161 between it and the grammatical filler mean. The second-best rated combination was \emptyset –*that*, with a z-score mean of 0.326 (SD: 0.932, SE: 0.155), followed by *that*– \emptyset with a z-score mean of 0.264 (SD: 0.909, SE: 0.151) and finally, *that*–*that* with a z-score mean of 0.101 (SD: 1.017, SE: 0.169).

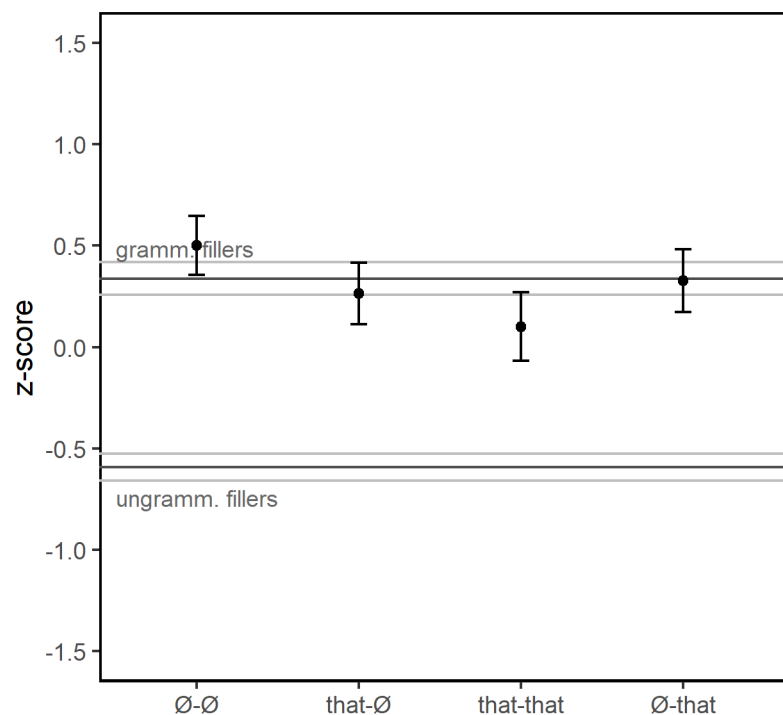


Figure 5.10 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (*that*-complementizer experiment), BSAfE ($n=18$)

Note that all the options with overt *that*-complementizers (i.e., *that*– \emptyset , \emptyset –*that*, *that*–*that*) were rated better than in the other varieties, i.e., closer to the grammatical filler mean. Overall, there is thus a less pronounced difference between the test items, with the highest z-score (0.499 for \emptyset – \emptyset) and the lowest (0.101 for \emptyset –*that*) much closer to each other (0.398)

than in e.g. AmE, where this difference was 0.705, or WSAfE, where it was 1.073. Also note that the difference (0.931) between the grammatical (z-score: 0.338) and ungrammatical filler means (z-score: -0.593) was even less pronounced than in the CSAfE data set.

In summary, it appears that compared to WSAfE (and to some extent CSAfE), BSAfE speakers are less conscious of the presence/absence of or, for that matter, grammaticality/ungrammaticality of *that*-complementizers. That is to say this syntactic feature did not seem to influence participants' ratings to the degree as it did in the other varieties. This could be interpreted to the effect that generally, *that*-complementizers are less entrenched in the mental networks of BSAfE speakers.

Finally, to compare the three South African varieties WSAfE, CSAfE and BSAfE, Figure 5.11 plots the results of all three data sets. Several patterns and tendencies become apparent: First, across all South African varieties, the ranking of test items is the same (with \emptyset - \emptyset rated best, followed by *that*- \emptyset , then \emptyset -*that* and finally, *that*-*that*) and second, the difference in ratings between test items (and, incidentally, also the grammatical and ungrammatical fillers, see above) was most pronounced in WSAfE, followed by the CSAfE group, and finally the BSAfE group. Furthermore, whereas the structure with no *that*-complementizers (\emptyset - \emptyset) received noticeably different ratings between the South African sub-varieties, the other combinations, in particular *that*-*that* and \emptyset -*that*, were rated very similarly across all South African varieties. Also note that the structure with a *that*-complementizer in C1 (*that*- \emptyset) was rated relatively similarly. This comes as somewhat of a surprise, as it was expected that the biggest difference in rating would affect this structure: As discussed in the introduction to this chapter, it is L1 stage V varieties that were presumed to be most likely to have 'inherited' this diachronic remnant and furthermore, the stepwise regression revealed that the interaction THAT_C1:VARIETY significantly influenced the rating of participants. However, WSAfE speakers rated *that*- \emptyset only slightly better (z-score: 0.418) than CSAfE (z-score: 0.238) and BSAfE (z-score: 0.264) speakers. For comparison, the AmE participants rated this combination considerably better, with a z-score mean of 0.647. On a final note, from the fact that three out of four data points (i.e., *that*- \emptyset , \emptyset -*that* and *that*-*that*) are very close to each other, and that the ranking of combinations was the same, one might conclude that the South African sub-varieties WSAfE, CSAfE, and BSAfE are less heterogeneous than often assumed (see discussion in section 5.1.2).

This finding, however, is less surprising against the background of Szmrecsányi et al.'s "core probabilistic grammar" (2016: 109) and Mair's generalization that "grammar unites and accent divides" (2008: 156). Indeed, much of the literature that is concerned with the question which DM phases the South African sub-varieties should be assigned to is based on phonological features (e.g. Bekker 2009; Makalela 2013; Du Plessis 2015; Mesthrie et al. 2015). However, the results discussed here suggest that in terms of grammar, the South African sub-varieties are quite homogeneous. This ties in with Schneider's observation, echoing Mair's rule of thumb about accent and grammar (2008: 156), that "[e]ach of [the sub-varieties] is associated with distinct linguistic features, *predominantly at the level of pronunciation*" (2020: 16-17, emphasis JH).

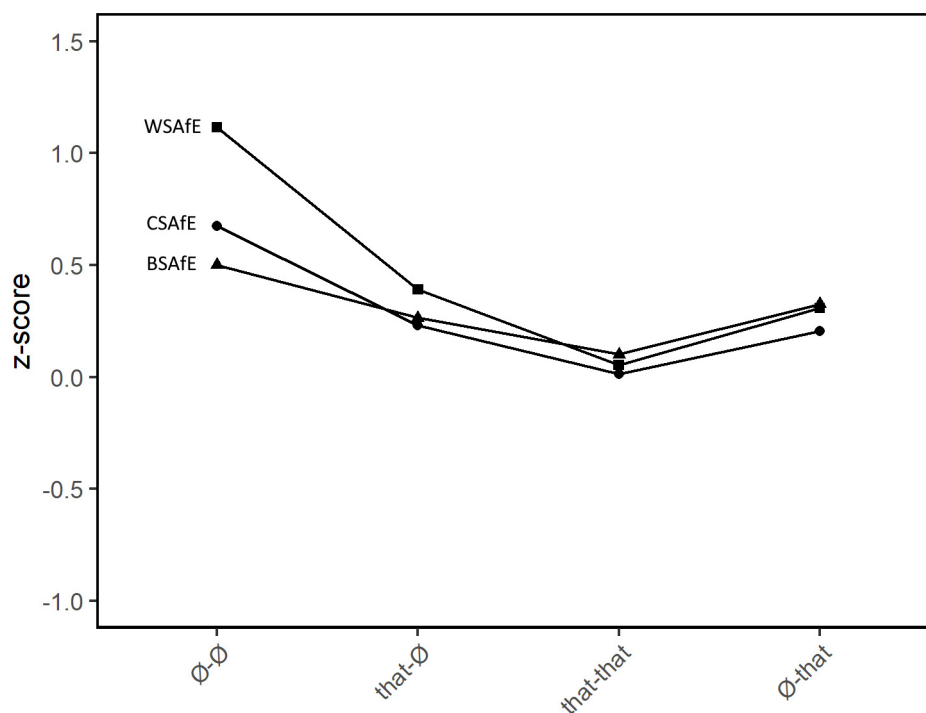


Figure 5.11 Z-scores of *THAT* vs. *NO THAT* interactions across C1 and C2, South African varieties (*that*-complementizer experiment)

5.1.3 *That*-complementizers in Singapore English

The pen-and-paper experiments at the National University of Singapore (NUS) were carried out on 29 and 30 October 2019. As in Austin and Cape Town, local staff¹³ helped recruit participants in the weeks leading up to these dates, and once the experiments were up and running, participants were encouraged to inform other students by word of mouth. In total, 31 participants (22 female, 9 male; age 19-24) could thus be recruited for the first experiment.

Figure 5.12, which shows the results of the individual grammatical and ungrammatical fillers, reveals that these were rated with great variance. This is evident from the whiskers, which were considerably longer than in the other varieties discussed so far. Also, the grammatical fillers were rated rather inconsistently, with four of them (WHEN2, IF1, AS1 and AS2) having negative z-score medians. In fact, filler IF1 grammatical was rated worse (z-score median: -0.507) than two ungrammatical fillers, WHEN2 (z-score median: -0.393) and AS1 (z-score median: -0.443). In other words, there is a less pronounced difference in ratings between ungrammatical fillers and grammatical fillers, which is also evident from their means. One reason for this might be that in Colloquial SingE, likely due to the influence of the Chinese and Malay substrates, “the verb generally appears in an uninflected form”, which “means that there is no subject-verb agreement” in SingE (Wee 2008b: 593-594). Because of this, it is possible that the participants were less sensitive to the difference between the

¹³ I am extremely thankful to Peter K W Tan from the National University of Singapore for his assistance in conducting the experiments.

grammatical and ungrammatical fillers, the latter of which featured erroneous subject-verb agreement (i.e., omission of the 3rd Ps. sg. *-s*; a similar effect was observed in BSAfE, see discussion in section 5.1.2.3 above). Again, this is a point that will have to be considered in future experimental designs.

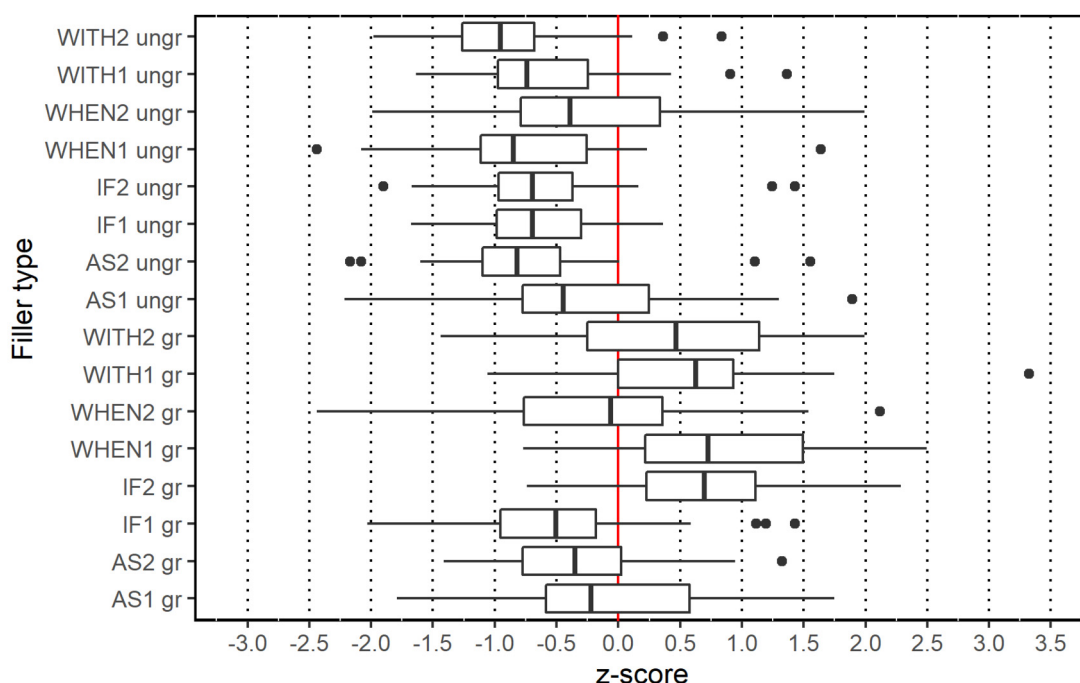


Figure 5.12 Z-scores of fillers (*that*-complementizer experiment), Singapore ($n=31$)

Removing item IF1 grammatical (this was done in all varieties, see the discussion in section 5.1.1), resulted in a grammatical filler mean of 0.263, with a SD of 0.924 and a SE of 0.063. The grammatical filler mean was lower than in the other data sets investigated so far. The ungrammatical filler mean was -0.601 , with a SD of 0.757 and a SE of 0.048. Thus, there was a difference of only 0.864 (compared to e.g. 0.931 in the Black SAfE data set, or 1.367 in the AmE data set) between the ungrammatical and grammatical filler means. Note that unlike the other varieties, this difference (cf. discussion in section 5.1.1) was more diverse across experiments (asymmetric encoding: 1.162, object pronoun extraction: 0.722). After the fillers were collapsed to obtain their means, the test items were plotted. Figure 5.13 shows the results, with \emptyset - \emptyset (i.e., no *that*-complementizers) clearly emerging as the best-rated variant, with a z-score mean of 0.954 (SD: 0.824, SE: 0.105), which is very similar to that of AmE (z-score: 0.949). As with the other varieties discussed so far, all remaining variants were clearly rated better than the ungrammatical fillers, suggesting that *that*-complementizers, in whatever combination across C1 and C2, were generally perceived as acceptable by the Singaporean participants. Notably, \emptyset -*that* was rated second best, with a z-score of 0.377 (SD: 0.879, SE: 0.112), followed by *that*- \emptyset (z-score: 0.146; SD: 0.917, SE: 0.116) and *that*-*that* (z-score: 0.009; SD: 0.863, SE: 0.110). Despite a similar sample size ($n=31$) to the American experiment ($n=38$), the standard errors were larger, with values between 0.105 and 0.116, indicating more variation in the Singaporean data.

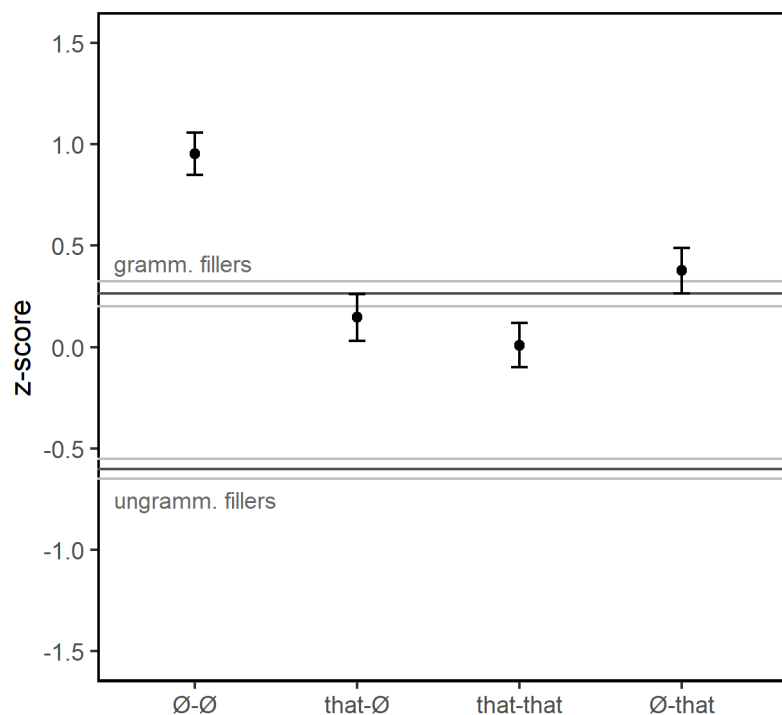


Figure 5.13 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (*that-complementizer experiment*), Singapore ($n=31$)

Figure 5.13 bears some resemblance to the South African data sets, where (as opposed to the American data) \emptyset -*that* was rated second-best, i.e., better than expected (z-score 0.263). Furthermore, the results do not provide evidence in support of Mesthrie’s ‘deleters and preservers’ theory (2006, 2008a, 2012), as both SingE and Black SAfE participants (representing the two varieties that were cited as prime examples of each type) clearly preferred the combination without overt *that*-complementizers (\emptyset - \emptyset), and rated the one with complementizers in both C1 and C2 (*that*-*that*) lowest.

5.1.4 *That*-complementizers in Kenyan English

To investigate *that*-complementizers in Kenyan English¹⁴, pen-and-paper experiments at the University of Nairobi (UoN) were carried out on 19 and 20 November 2019. Participants were recruited the same way as for the previous experiments: By advertising the experiments with the help of local staff¹⁵ in the weeks ahead, and by encouraging students who had already

14 It is acknowledged that the existence of a variety called ‘Kenyan English’ is not universally accepted, particularly in Kenya itself. Thus, “not many [Kenyans] like the term ‘Kenyan English’”, instead opting for the term “English used in Kenya” (Buregeya p.c. in July 2019). However, from an academic point of view there is little doubt about the existence of a distinct PCE variety that has reached the nativization phase (i.e., stage III) of Schneider’s Dynamic Model (Buregeya 2019:1) and is commonly referred to as “Kenyan English” (cf. Buregeya 2019: viii).

15 I am extremely thankful to Alfred Buregeya at the University of Nairobi for helping me in recruiting participants and organizing a lecture hall for the experiment.

participated to recruit peers by word of mouth. For the first experiment, 38 participants (19 female, 19 male; age 20-30) were recruited.

Figure 5.14 shows the results of the individual grammatical and ungrammatical fillers. The box plots show a great variance in rating, evident from the large boxes and long whiskers when compared to e.g. the American data set. The ungrammatical fillers were rated quite consistently, reflecting the patterns from the other varieties: The range between the lowest median (WITH2 ungrammatical: -0.987) and the highest (AS1 ungrammatical: -0.625) amounts to just 0.362 (for comparison, in the American data set this value was 0.476). The grammatical fillers, however, were rated less consistently. The difference between the lowest median (AS2 grammatical: -0.350) and the highest (WHEN1 grammatical: 1.094) amounted to 1.444.

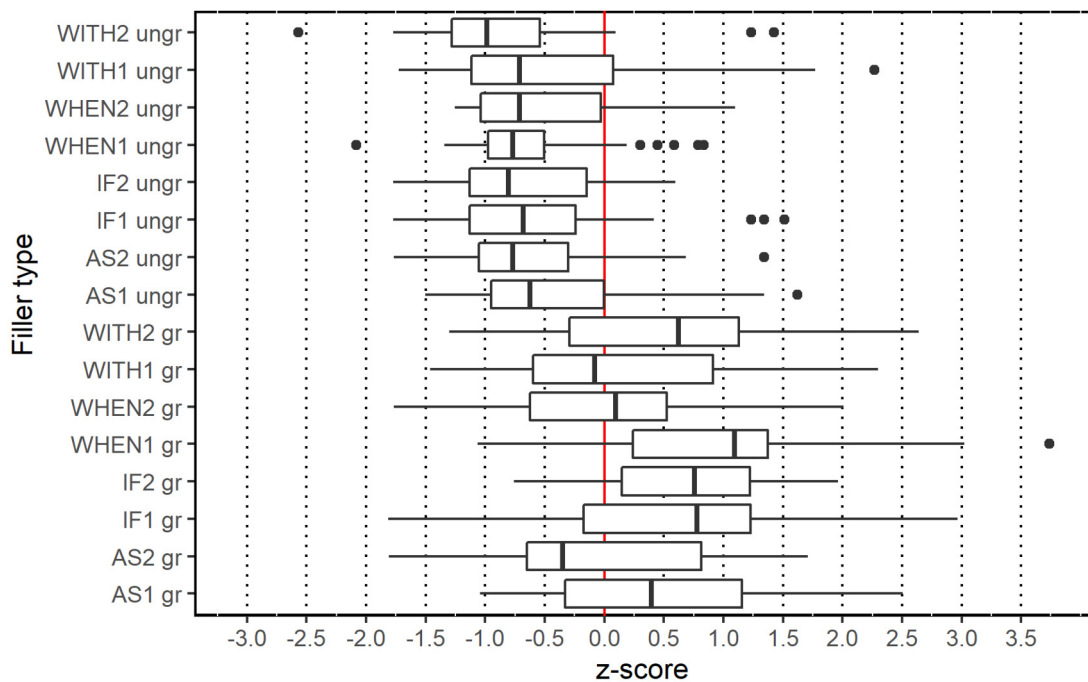


Figure 5.14 Z-scores of fillers (that-complementizer experiment), Kenya ($n=38$)

What is notable is that the grammatical filler IF1 (z-score: 0.777) was rated considerably better than in the other data sets examined so far (e.g. USA: -0.666) – in fact, in the Kenyan data set, this filler was rated second best after WHEN1 grammatical (z-score: 1.094). However, as discussed in section 5.1.1, filler IF1 grammatical was excluded from further analysis. This resulted in the grammatical filler mean increasing only slightly from 0.390 to 0.400, with a SD of 0.960 and a SE of 0.588. The ungrammatical filler mean was -0.574 , with a SD of 0.754 and a SE of 0.043. Thus, there was a difference of 0.974 between ungrammatical and grammatical filler mean (compared to e.g. 0.864 in the Singaporean data set, 0.931 in the Black SAfE data set, and 1.367 in the AmE data set). The smaller difference between grammatical and ungrammatical fillers is likely due to a general tendency in KenE

towards lack of number agreement¹⁶ (cf. Buregeya 2019: 64-66), an effect also discussed regarding BSAfE and SingE (see sections 5.1.2.3 and 5.1.3 above). Note, however, that in comparison to the other experiments (asymmetric encoding: 0.780, object pronoun extraction: 0.747), the difference between the ungrammatical and grammatical filler means was still higher.

Figure 5.15 shows how the test items were rated. The standard errors, ranging between 0.094 (*that*–*that*) and 0.111 (\emptyset – \emptyset), were slightly larger than in the American data set, which had the same size ($n=38$). As was the case with the other data sets, all test items in the Kenyan data set were rated better than the ungrammatical fillers. However, the lowest rated combination, *that*–*that*, was rated worse (with a negative z-score of -0.096 ; SD: 0.823, SE: 0.094) than in the other data sets. In fact, all combinations except for that without any *that*-complementizers, i.e., \emptyset – \emptyset (z-score: 0.774; SD: 0.971, SE: 0.111) were rated worse than the grammatical fillers, a pattern that only the CSAfE data also exhibited. It is this data set with which the Kenyan data set shares most of its characteristics; that is, only \emptyset – \emptyset was rated better than the grammatical fillers, with the remaining combinations receiving ratings that were well below the grammatical filler mean. A further common feature is that \emptyset –*that* was rated second-best (z-score: 0.230; SD: 0.823, SE: 0.095), followed by *that*– \emptyset (z-score: -0.013 ; SD: 0.849, SE: 0.097) and *that*–*that* (z-score: -0.096), mirroring the Singaporean data set.

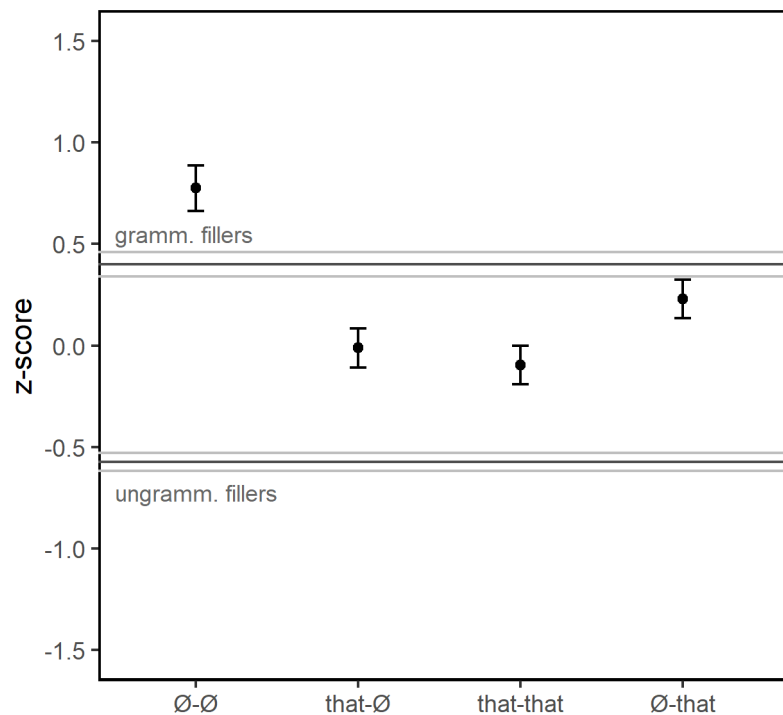


Figure 5.15 Z-scores of *THAT* vs. *NO THAT* (\emptyset) in C1:C2 (dark gray horizontal lines: filler means; light gray lines: standard error) (*that*-complementizer experiment), Kenya ($n=38$)

16 Although note that unlike in BSAfE and SingE, the type of agreement error that featured in the ungrammatical fillers, i.e., plural verb forms with a singular subject, “is less common in KenE” than the reverse (Buregeya 2019: 66).

Again, the results indicate that *that*-complementizers were deemed acceptable in all possible combinations. However, in contrast to the other data sets, two combinations (*that*– \emptyset and *that*–*that*) received negative z-scores, and a third one was very close (\emptyset –*that*). This suggests that for the Kenyan participants, the combination without *that*-complementizers (\emptyset – \emptyset) was clearly the preferred combination. As discussed in sections 5.1.2.3 (BSAfE) and 5.1.3 (SingE), these results do not confirm Mesthrie’s ‘deleters and preservers’ theory (2006, 2008a, 2012), according to which *that*-complementizers should be preserved, or even ‘undeleted’, in African varieties and deleted in Asian varieties.

Rather, the evidence so far lends support to Kortmann’s “continuum along the parameter ‘deletion vs. preservation’” (2014: 176). This continuum ranges from Pidgins and Creoles as extreme cases of ‘deleters’ via L2 varieties to L1 varieties, which Kortmann describes as “preservers” (2014: 176). Thus, in the L1 variety AmE, overt *that*-complementizers in C1 (z-score: 0.647) and in both clauses (z-score: 0.357) were rated better than in the African L2 varieties KenE (–0.013 and –0.096, respectively) and Black SAfE (0.264 and 0.101, respectively), and in the Asian L2 variety SingE (0.146 and 0.009, respectively).

5.1.5 *That*-complementizers across varieties

To highlight variety-specific and DM stage-specific differences and thus test the hypotheses outlined at the beginning of this chapter, all *that*-complementizer combinations were also examined across varieties. To this end, data points were plotted in a scatter plot, and using the *ggplot2* package for *R* (Wickham 2016), the smoothed conditional means function `stat_smooth()` was employed to fit linear models. The scatter plot made it possible to illustrate variation in rating in the data sets, and the `stat_smooth()` function allowed for the identification of trends across varieties. These were ordered along the *x* axis according to DM stage: from left to right, USA and WSAfE (stage V), SingE, CSAfE and BSAfE¹⁷ (stage IV) and KenE (stage III). Note that all of the trends discussed below are only minimal, evident from the low gradients of the linear models that were superimposed on the scatter plots. As discussed in section 5.1 above, this is to be expected, given that syntactic variation across varieties of English has been argued to be necessarily small, as noted e.g. by Szmrecsányi et al. in the context of their “core probabilistic grammar” (2016: 109).

First, the significant interaction determined by stepwise regression (see section 5.1) will be explored; THAT_C1:VARIETY. Figures 5.16 (*that* in C1) and 5.17 (no *that* in C1) show the ratings of *that*-complementizers in C1 across varieties. The scatter plots indicate that the ratings were quite consistent: The data points are clustered relatively closely together. In Figure 5.16, the linear model shows a slight negative correlation, that is, *that*-complementizers are rated better the higher a DM stage.

This confirms the prediction that *that*-complementizers, as a historic remnant, are more deeply entrenched in stage V varieties. The results are also consistent with the corpus study (see chapter 4), where a covarying-collexeme analysis of the GloWbE data revealed that the absence of C1 *that*-complementizers showed a strong attraction to stage III varieties, and with Hoffmann’s ICE study, in which he determined “a slight dispreference for C1s without a *that*-

17 In the following plots, BSAfE is located closest to stage III (KenE) on the *x* axis to account for the fact that it is currently progressing from stage III into IV, a process that has not been completed yet (see discussion in section 5.1.2).

complementizer in Stage V varieties” (2019: 210). In Figure 5.17, no such correlation, or at best a very weak one, can be determined. This suggests that structures with no *that*-complementizer in C1 are rated very consistently across all varieties. That is, items with no *that*-complementizer in C1 influenced the rating of participants equally in every variety.

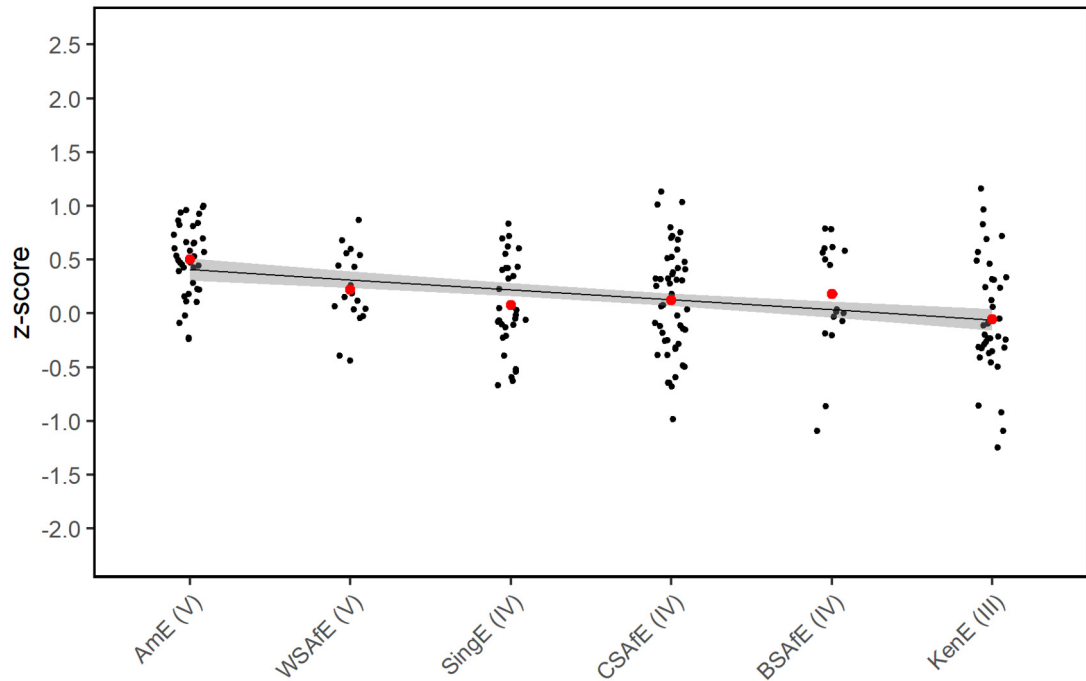


Figure 5.16 Scatter plot of *THAT* in C1 z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

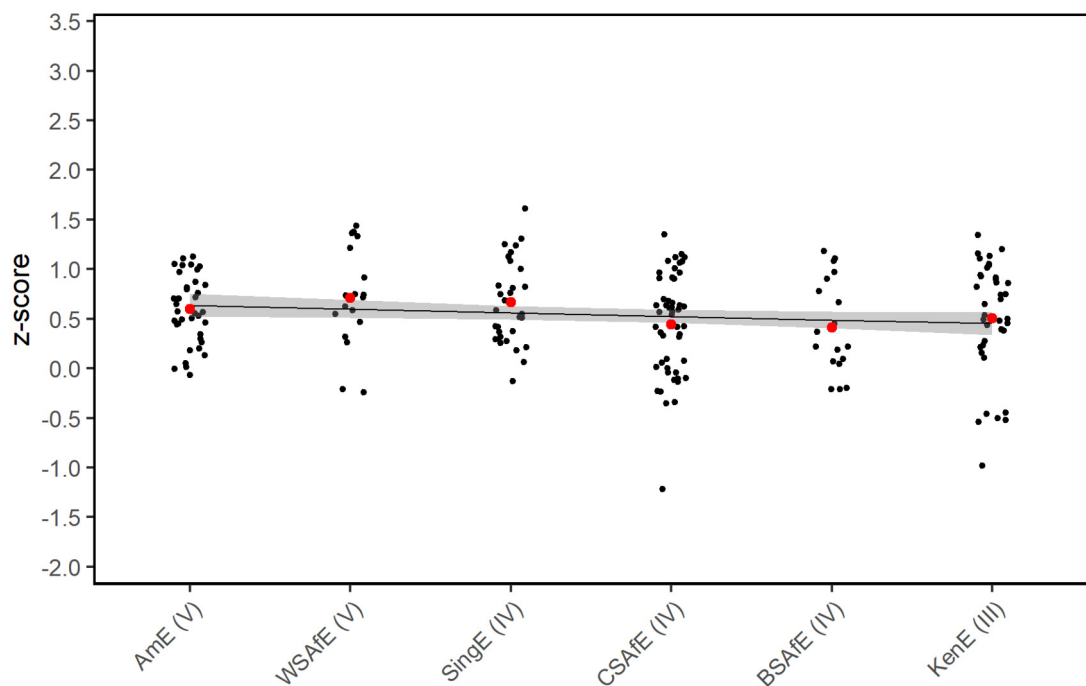


Figure 5.17 Scatter plot of *NO THAT* (\emptyset) in C1 z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

Finally, Figure 5.18 plots the differences in ratings between items with *that*-complementizers in C1 and no *that*-complementizers in C1. That is, the z-score mean of *that* in C1 was subtracted from the z-score mean of no *that* in C1, illustrating the degree to which participants preferred test items with no *that*-complementizers over those with *that*-complementizers. The linear model reveals a relatively strong positive correlation, which can be interpreted as ‘the lower DM stage a variety is, the higher the preference for structures without *that*-complementizers in C1 is’ – or, conversely, ‘the higher DM stage a variety, the less sensitivity to *that*-complementizers in C1’. This confirms the prediction that *that*-complementizers as a historical remnant are more entrenched in the prototypical stage V varieties. It also lends further support to the corpus study findings, where the absence of *that*-complementizers showed a strong attraction to stage III varieties (see above). On a further note, these results also prove that the two-pronged approach of corroborating corpus data with experiments is indeed a feasible and fruitful approach when investigating syntactic phenomena.

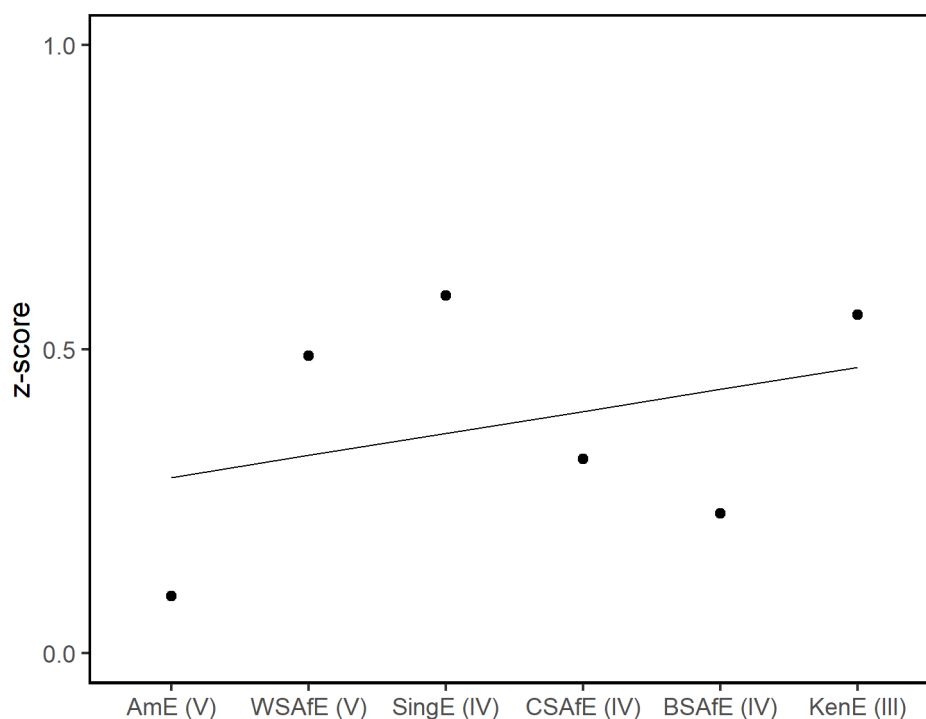


Figure 5.18 Magnitude estimation z-scores of *THAT* in C1 subtracted from z-score ratings of *NO THAT* in C1 across varieties

Moving on to C1:C2 interactions, Figure 5.19 shows the results for the combination \emptyset – \emptyset , i.e., CCs with no *that*-complementizers. The plot reveals a weak negative linear correlation between the z-score mean and the varieties, which were arranged according to DM stage (see above). The slope is negative, which means that the lower the DM stage, the lower the z-score rating was. This can be interpreted to the effect that \emptyset – \emptyset is slightly preferred in the higher DM stages. Note that there are several outliers, especially in the CSAfE and BSAfE data.

Also, the broad distribution of data points in the WSAfE data indicates rather inconsistent ratings when compared to the AmE or CSAfE data.

Next, the scatter plot in Figure 5.20 shows a similar trend regarding *that*-complementizers in C1 (*that*- \emptyset). Again, the line indicates a weak negative linear correlation between variety/DM stage and z-score ratings, although the negative slope is slightly steeper than in Figure 5.19, indicating a stronger correlation between z-score and DM stage. That is, the higher a DM stage, the better *that*-complementizers in C1 were rated, which in turn can be interpreted as a stronger entrenchment of this feature in higher DM stages. This is in line with the predictions made in section 3.1.1, i.e., there appears to be a stronger entrenchment (as is evident from the better MET ratings) of C1 *that*-complementizers in stage V varieties.

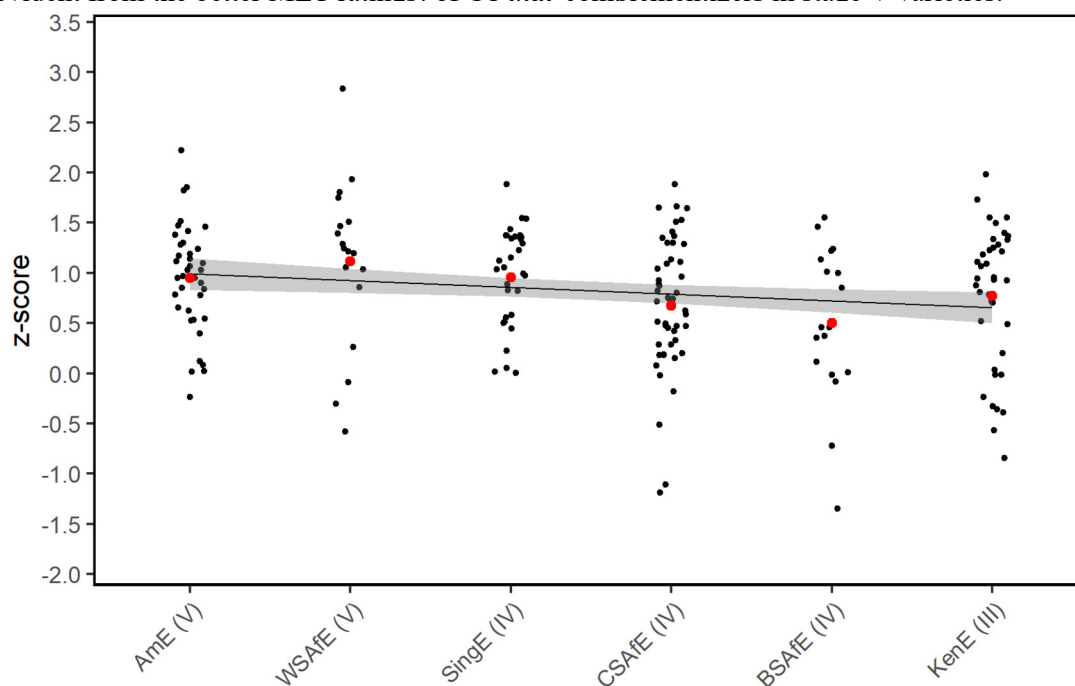


Figure 5.19 Scatter plot of NO THAT-NO THAT (\emptyset - \emptyset) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

Note that despite the similarities between Figure 5.19 (\emptyset - \emptyset) and Figure 5.20 (*that*- \emptyset), *that*-complementizers in C1 were consistently rated worse across all varieties. This difference in rating confirms the prediction, made in section 3.1.1, that C1 *that*-complementizers are generally dispreferred in PdE CCs, thereby also reinforcing the claim that PdE CCs are more paratactic than hypotactic. This is better appreciated by looking at Figure 5.22, in which the results of the combinations \emptyset - \emptyset and *that*- \emptyset are plotted for comparison, and Figure 5.21 with the respective scatter plots and regression lines. The plots show that in all varieties, the combination without *that*-complementizers (\emptyset - \emptyset) was rated better than *that*- \emptyset . Figure 5.20 also highlights the correlation between DM stage and *that*-complementizers in C1: *that*- \emptyset was rated best in stage V varieties, followed by stage IV varieties and finally, stage III variety KenE. Again, this is evidence for a correlation between *that*-complementizers in C1 and DM stage: the higher the DM stage, the more entrenched the combination *that*- \emptyset . A slightly different picture is presented by Figure 5.23, which shows a scatter plot with the ratings of the combination *that*-*that*. Note that while the WSAfE ratings are characterized by a broad

distribution as in the other three scatter plots, here there is a cluster around the mean, suggesting more consistent ratings.

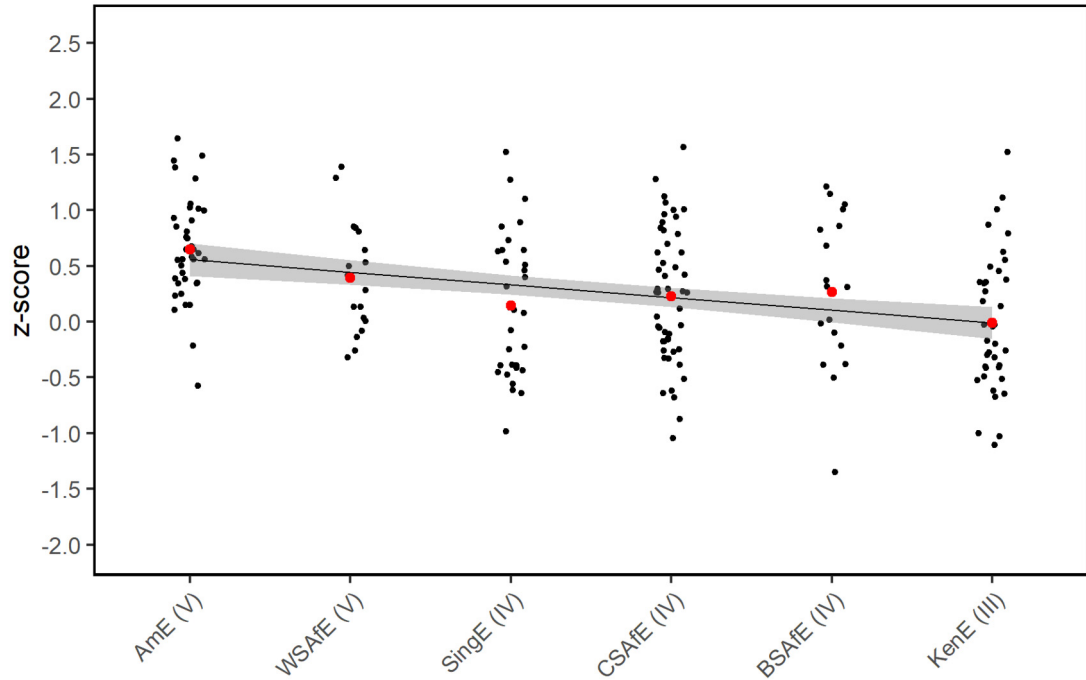


Figure 5.20 Scatter plot of THAT-NO THAT (*that-Ø*) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

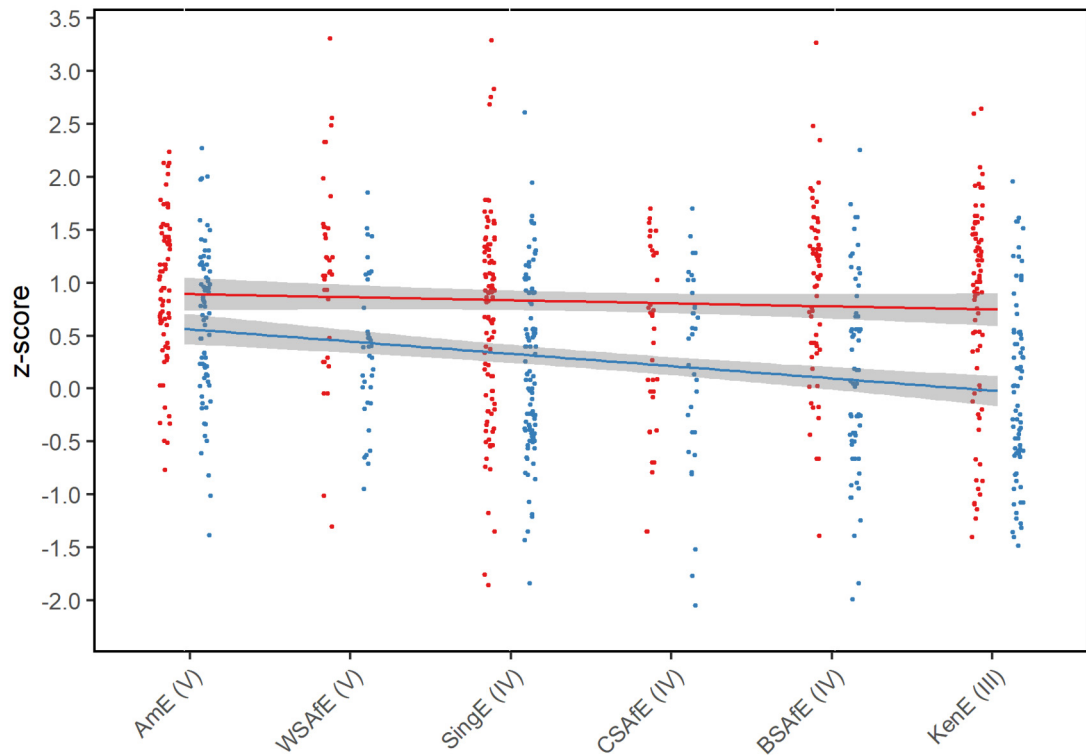


Figure 5.21 Scatter plot of NO THAT-NO THAT ($\emptyset-\emptyset$) (red) and THAT-NO THAT (*that-Ø*) (blue) z-score ratings across varieties, with superimposed linear regression lines

As was the case with the combinations $\emptyset-\emptyset$ and *that*- \emptyset , there is a weak negative linear correlation between z-score mean and DM stage, evident from the negative slope. Thus, the plot suggests that the combination *that*-*that* is slightly preferred in the higher stages, although this correlation is not as pronounced as was the case with *that*- \emptyset . This finding contradicts Hoffmann’s claim that “Stage IV and III L2 varieties exhibit an even stronger paratactic relationship [than stage V varieties] between C1 and C2” (2019: 210), according to which the plot should show a *positive* linear correlation between z-score and DM stage.

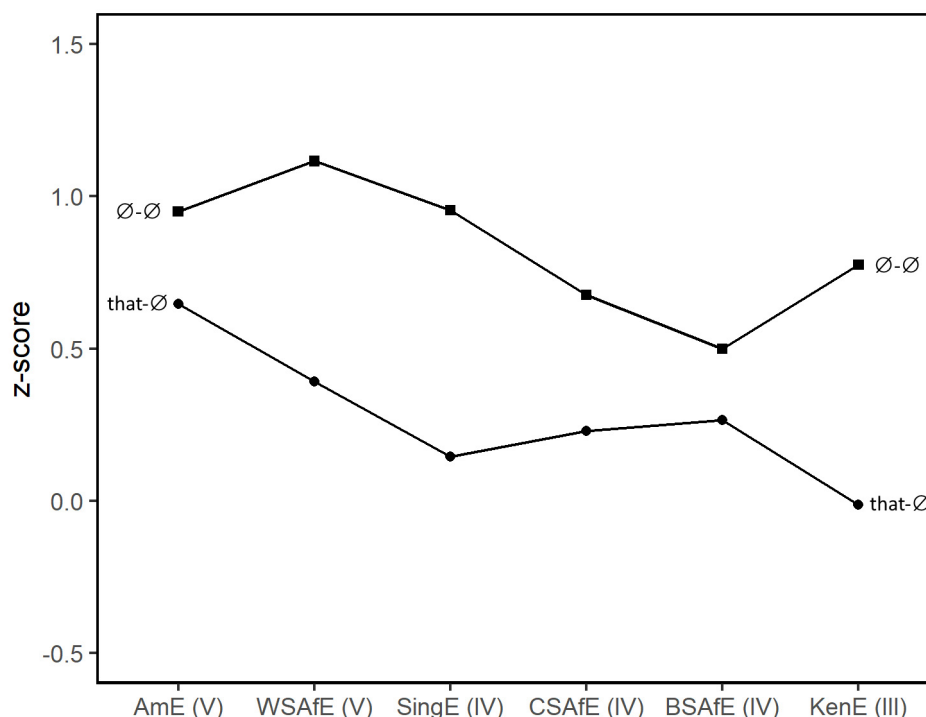


Figure 5.22 Magnitude estimation z-scores of NO THAT-NO THAT ($\emptyset-\emptyset$) and THAT-NO THAT (*that*- \emptyset) z-score ratings across varieties

Next, the scatter plot in Figure 5.24 shows ratings of the combination \emptyset -*that* across varieties. As in the other plots, WSAfE is characterized by a broad distribution compared to the other varieties, indicating more variance in participants’ ratings – there are, in fact, two clusters, one above and one below the mean, which indicates less consistent ratings by the participants. It is striking that across all varieties (and thus, DM stages), \emptyset -*that* was rated very similarly, with z-score means ranging between 0.205 (CSAfE) and 0.377 (SingE). This is also evident from the almost perfectly horizontal line, which suggests that there is no correlation across varieties and DM stages regarding this combination. That is, the combination \emptyset -*that* was rated equally across all varieties. Finally, it is noteworthy that as was the case with the combination *that*- \emptyset , across all varieties the combination *that*-*that* was rated worse than the option with no *that*-complementizers ($\emptyset-\emptyset$). The scatter plot in Figure 5.25 illustrates this: Again, across varieties, the combination without *that*-complementizers was rated better than that with *that*-complementizers in C1 and C2.

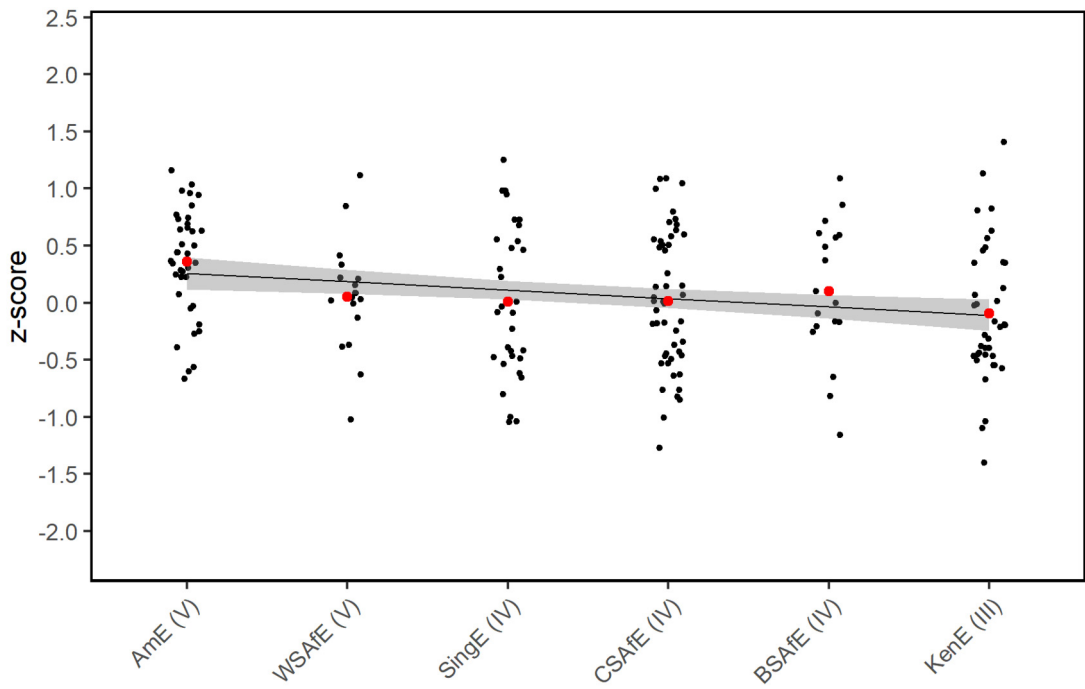


Figure 5.23 Scatter plot of THAT-T THAT (*that*–*that*) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

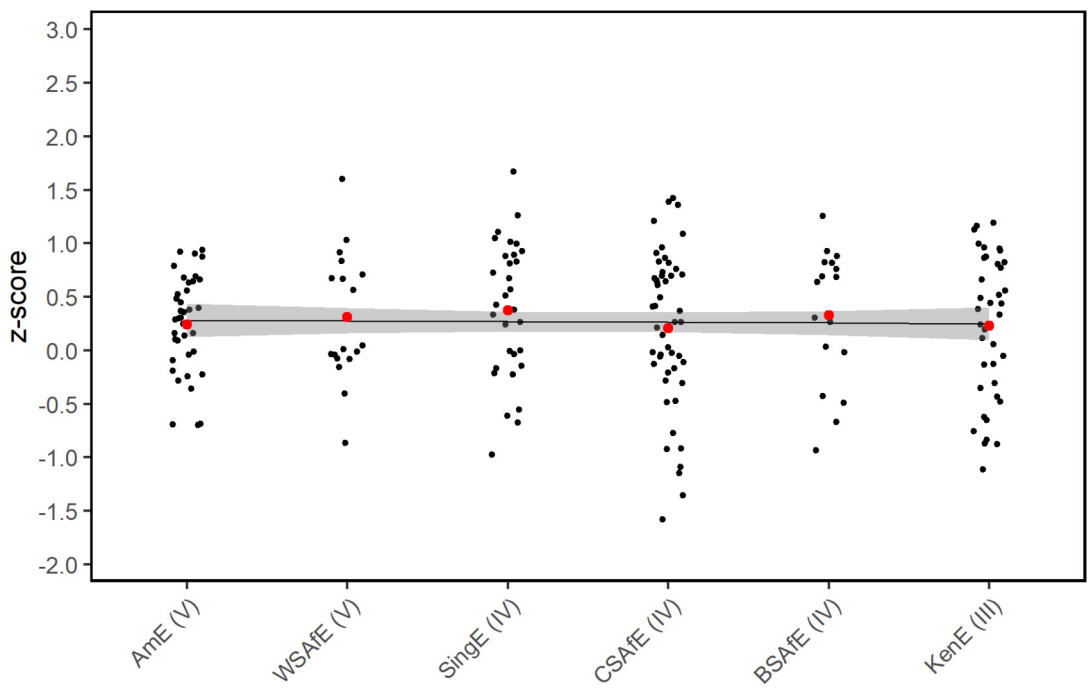


Figure 5.24 Scatter plot of NO THAT-T THAT (\emptyset –*that*) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

In summary, the comparison of the four *that*-complementizer combinations (\emptyset – \emptyset , *that*– \emptyset , \emptyset –*that* and *that*–*that*) across varieties and DM stages has revealed the following trends: First, CCs with no overt *that*-complementizers are clearly preferred across all varieties and DM stages, in accordance with Hoffmann’s claim of “a strong general preference for the absence of complementizers” (2019: 126) in English CCs, and confirming the results of previous corpus studies as well as the corpus study in chapter 4. Furthermore, this finding provides strong evidence for a paratactic analysis of PdE CCs.

Second, there appears to be a weak negative correlation between this combination (\emptyset – \emptyset) and DM stage; the same applies to the combination with *that*-complementizers in C1 and C2 (*that*–*that*), indicating that these symmetric combinations are slightly preferred in higher DM stages. A stronger correlation could be determined for the combination with a *that*-complementizer in C1 (*that*– \emptyset). This corresponds to the prediction that as a diachronic hypotactic remnant, this feature is preferred in the ‘conservative’ L1 stage V varieties (AmE and WSAfE) as “a weak indication that C1 used to be syntactically subordinate to C2” (Hoffmann 2019: 210). Further support for this claim comes from the observation that in none of the stage IV and III varieties (SingE, CSAfE, BSAfE, KenE) *that*-complementizers (i.e., *that*– \emptyset , \emptyset –*that* and *that*–*that*) were rated better than the grammatical filler mean (with the exception of \emptyset –*that* in SingE). The means of the combination with a *that*-complementizer in C2 only (\emptyset –*that*) were very similar across all varieties, so that no correlation could be determined.

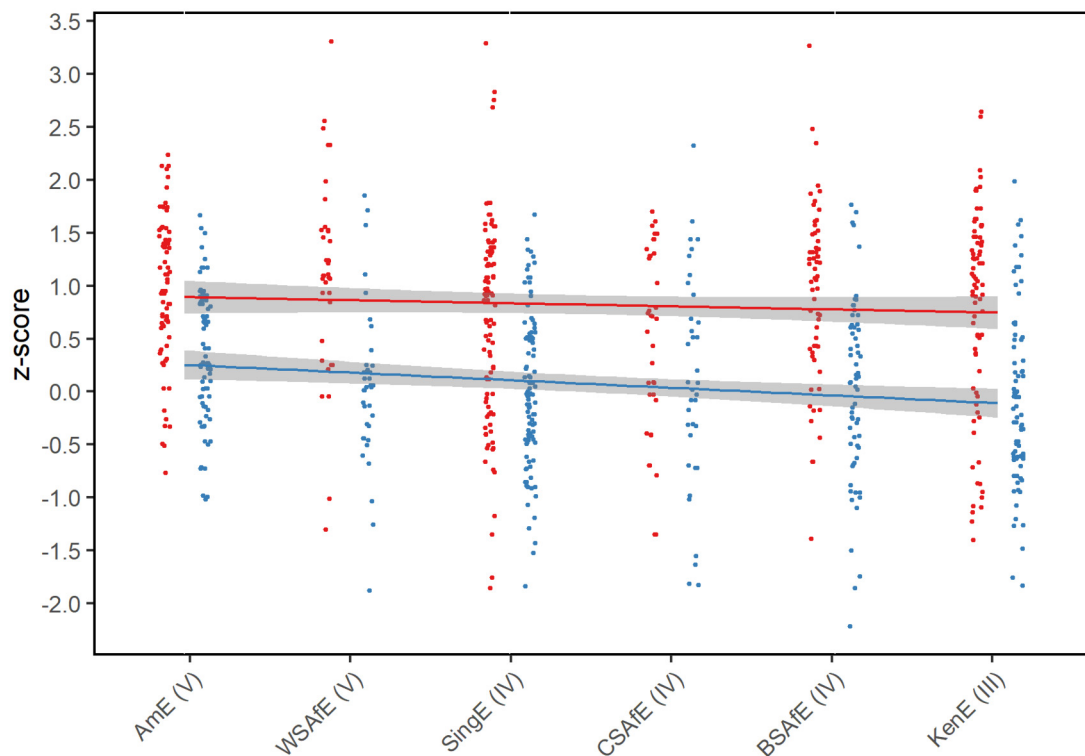


Figure 5.25 Scatter plot of NO THAT-NO THAT (\emptyset – \emptyset) (red) and THAT-THAT (blue) z-score ratings across varieties, with linear regression lines

Figure 5.26 shows the ratings of all four combinations across all six varieties, further underscoring the clear preference for the combination with no *that*-complementizers in all varieties of PdE. The plot also illustrates that in all varieties, with the exception of AmE, the more *that*-complementizers that were in a structure – irrespective of their combination across C1 and C2 – the worse the rating was. In other words, \emptyset – \emptyset was always rated best; *that*–*that* was always rated lowest. This is somewhat of a surprise, since it was expected that the combination \emptyset –*that* would be rated worst, based on the literature, where \emptyset –*that* has been described as appearing “so infrequently [...] that it seems unlikely that these structures are entrenched in large parts of the population” (Hoffmann 2019: 212). Rather, *that*–*that* as an iconic structure, encoding the symmetric semantics of the construction, was expected to be a more acceptable alternative, as was also implied by Hoffmann, who noted that “Stage IV and III L2 varieties exhibit an even stronger paratactic relationship between C1 and C2” (2019: 210). However, it appears that participants generally rated test items according to the principle ‘the less *that*-complementizers in the construction, the better’. This finding refutes predictions about *that*–*that* being rated better in some varieties due to its symmetric nature. Thus, an ‘iconicity effect’ cannot be confirmed here. Furthermore, this finding contradicts Mesthrie’s deleters vs. preservers theory, according to which the opposite should hold true for the African varieties, i.e., ‘the more *that*-complementizers, the better the ratings’. Rather, it appears that Kortmann’s claim about an L1–L2 continuum applies here, such that *that*-complementizers are rated better in L1 varieties (i.e., AmE and WSAfE), which is also in line with Hoffmann’s claim of *that*-complementizers being a historical remnant that is preferred in stage V.

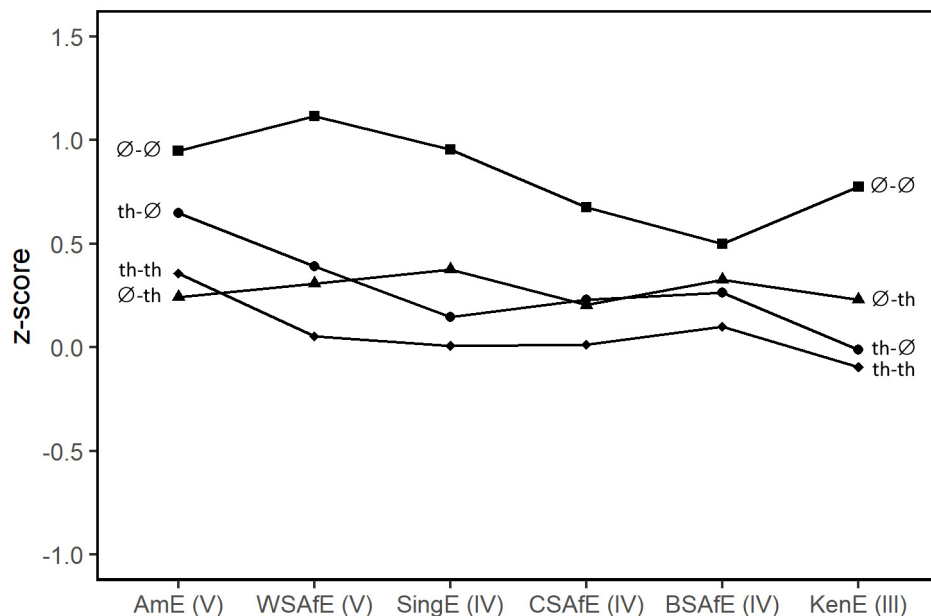


Figure 5.26 Magnitude estimation z-scores of NO THAT-NO THAT (\emptyset – \emptyset), THAT-NO THAT (*that*– \emptyset), NO THAT-THAT (\emptyset –*that*) and THAT-THAT (*that*–*that*) across varieties

What also becomes evident from Figure 5.26 is that with only one exception (*that*–*that* in KenE), *that*-complementizers in all combinations were generally rated with a positive z-score. This suggests that while combinations with *that*-complementizers are generally disfavored

compared to those with no overt *that*-complementizers (see above), none of them were perceived as ungrammatical. From this, it can be concluded that *that*-complementizers in all combinations are (albeit weakly) entrenched in the PdE CC network and across DM stages.

Finally, in the context of the Dynamic Model it must be noted that the *that*-complementizer experiment turned up little evidence for any morphosyntactic innovation in stage III, apart from a stronger preference of structures without *that*-complementizers (see above). While trends across stages did emerge (see above), no tendencies towards an innovative use of *that*-complementizers in CCs could be determined – neither in the stage III variety KenE nor in BSAfE, which has not fully completed the transition into stage IV yet and thus could also be expected to exhibit stage III-like phenomena.

5.2 Asymmetric encoding

The asymmetric encoding of C1 using *as* and C2 using *then* clause-initially (henceforth: as_{C1} and $then_{C2}$) has only received little attention so far (see discussion in section 3.6). The only relevant study presently known to the author is Hoffmann (2019), who devotes several pages to this phenomenon that, following the principle of iconicity, encodes the asymmetric semantics of the CC construction. These “innovations that depart more significantly from the exonormative input” (Hoffmann 2019: 227) are also of interest in the context of the parataxis vs. hypotaxis debate. As discussed in section 3.6, CCs that are encoded using as_{C1} and/or $then_{C2}$ are characterized by “the semantic subordination of C1 as the independent variable to the dependent variable C2” (Hoffmann 2019: 227). Of course, against the background of the principle of iconicity (i.e., form motivated by meaning), *semantic* subordination also comes with the implication of *syntactic* subordination. Thus, the experimental results can contribute evidence to resolving the question whether and how paratactic (or hypotactic) English CCs are. If the prototypical CCs without as_{C1} and $then_{C2}$ are rated considerably better than the alternatives, this would lend further support to English CCs being paratactic.

Apart from investigating the general preference or dispreference of asymmetric encoding using as_{C1} and $then_{C2}$ in English CCs, a further aim of the second MET experiment was to find out whether there are any significant differences in rating across varieties. The following hypotheses, discussed in section 3.6, were tested:

- Due to the pronounced general tendency of English CCs towards parataxis, the prototypical symmetric encoding without as_{C1} and $then_{C2}$ (henceforth: \emptyset – \emptyset) is clearly preferred across varieties;
- however, substrate/adstrate effects lead to asymmetric encoding using $then_{C2}$ (henceforth: \emptyset -*then*) being more acceptable in SingE than in other varieties (cf. Hoffmann 2019: 229-230);
- in line with Mesthrie’s ‘deleters vs. preservers’ claim (2006, 2008a, 2012), speakers of the L2 African varieties KenE, BSAfE and CSAfE rate the use of ‘extra’ elements such as as_{C1} and $then_{C2}$ better than other varieties, in particular, SingE as a prototypical ‘deleter’ (thus partially contradicting the second hypothesis above);
- or, following Kortmann’s L1–L2 continuum hypothesis (2014), speakers of the L2 varieties KenE, BSAfE, CSAfE, and SingE rate structures with as_{C1} and $then_{C2}$ differently than speakers of the L1 varieties AmE and WSAfE (although it is unclear in what way);

- similarly, in line with the Dynamic Model, speakers of stage III and IV varieties KenE, BSAfE, CSAfE, SingE give better ratings to structures with *as*_{C1} and *then*_{C2} than speakers of stage V varieties (AmE, WSAfE), due to morphosyntactic innovation in the lower DM stages (cf. Schneider 2003, 2007).

In order to test these hypotheses, the second experiment was designed to investigate the acceptability of *as*_{C1} and *then*_{C2} in English CCs across varieties and DM stages. The following two factors, with two levels each, were crossed in the experiment:

- AS C1 (levels: AS, NO AS)
- THEN C2 (levels: THEN, NO THEN)

As was the case with the first experiment investigating *that*-complementizers (see section 5.1), all possible factor combinations resulted in 4 cells. To present every participant all four of these conditions (that is, \emptyset - \emptyset , *as*- \emptyset , \emptyset -*then* and *as*-*then*) using different lexical material each time, eight lexicalizations were created (since four were regarded too few, see discussion in section 5.1). The lexicalizations, based on corpus tokens from GloWbE, are shown in (5.7):

(5.7) ASYMMETRIC ENCODING lexicalizations with AS C1 and THEN C2

- (As/the) more wind turbines are built, (then) the more accidents occur.*
- As our lives become busier/ The busier our lives become,
(then) the more stressed we are.*
- As things become more complex/ The more complex things become,
(then) the more we need simplicity.*
- As a website is more intricate/ The more intricate a website is,
(then) the more skills are needed to look after it.*
- As a person becomes more mature/ The more mature a person becomes,
(then) the more his responsibilities are.*
- As the price gets higher/ The higher the price gets,
(then) the more tender the meat.*
- As people get richer/ The richer people get,
(then) the better services they demand.*
- As one experiences more stress/ The more stress one experiences,
(then) the more mistakes are made.*

Subsequently, the sentences above were used to create all four factor combinations twice, yielding $8 \times 4 = 32$ tokens. These tokens were then split into four material sets, each of which consisted of eight tokens. As an example, material set 1 is provided in (5.8):

(5.8) ASYMMETRIC ENCODING lexicalizations with AS C1 and THEN C2, Material set 1

- As more wind turbines are built, **then** the more accidents occur.*
- As our lives become busier, the more stressed we are.*
- The more complex things become, **then** the more we need simplicity.*
- The more intricate a website is, the more skills are needed to look after it.*
- As a person becomes more mature, **then** the more his responsibilities are.*
- As the price gets higher, the more tender the meat.*
- The richer people get, **then** the better services they demand.*
- The more stress one experiences, the more mistakes are made.*

Furthermore, the experiment featured filler items, some of which were adapted from the first experiment. They had the form of conditional sentences based on five different patterns; IF (5.9a), WHEN (5.9b), WITH (5.9c), SHOULD (5.9d) and WOULD (5.9e):

(5.9) **Filler item patterns**

- a. *If you have a newer version, the better.*
- b. *When people care more, the world will become better.*
- c. *With more work you will be more stressed.*
- d. *Should more documents be discovered, the more we will find out.*
- e. *Would the hours be reduced the less the salary will be.*

For each of the three patterns (a-c), two grammatical and two ungrammatical lexicalizations were created; for the two patterns (d) and (e), one grammatical and one ungrammatical lexicalization was created. In total, there were thus 16 filler items so that as in the first experiment, a filler:stimuli ratio of 2:1 could be achieved. The ungrammatical fillers featured erroneous subject-verb agreement such that the 3rd Ps. sg. -s was either deliberately omitted (5.10 a-c) or added (5.10 d-e):

(5.10) **Examples of ungrammatical fillers**

- a. *If one **speak** more, the better the language.*
- b. *When someone **spend** too much, the finances are worse.*
- c. *With a faster car my dad **come** home sooner.*
- d. *Should a man **grows** older the wiser his thoughts.*
- e. *Would more products **is** sold, the better for the company.*

As was done in the first experiment, the 16 fillers were added to the eight test items and the resulting set of 24 tokens was then randomized. Subsequently, four material sets, each consisting of 24 tokens, were created so that each material set featured the four possible factor combinations (i.e., \emptyset - \emptyset , *as*- \emptyset , \emptyset -*then* and *as*-*then*) with different lexicalizations and in different places in the questionnaire. In total, 195 subjects participated in the second experiment:

- University of Texas at Austin: 42 participants (23 female, 19 male; age 18-26);
- University of Cape Town: 91 participants from the following sub-varieties:
 - 6 WSAfE speakers (5 female, 1 male; age 20-23)
 - 49 CSAfE speakers (36 female, 13 male; age 18-32¹⁸)
 - 27 BSAfE speakers (25 female, 2 male; age 18-40¹⁹)
 - 1 SA Indian South African English (IndSAfE) speaker (female, age 19)
 - 1 L1 Afrikaans speaker who identified as ‘White South African’ (female, age 20)
 - 7 who indicated otherwise (e.g. ‘international’, ‘other’);
- National University of Singapore: 32 participants (23 female, 9 male; age 19-24);
- University of Nairobi: 39 participants (18 female, 21 male; age 20-30).

Table 5.5 shows the amount of material sets that were filled out in each variety. As was the case with the first experiment (*that*-complementizer), it was not possible to meet the initial goal of recruiting at least eight participants per material set per variety. This could only be achieved regarding AmE, CSAfE, and KenE.

¹⁸ One participant aged 32, the remaining between 18-23.

¹⁹ One participant aged 40, the remaining between 18-23.

Table 5.5 Number of material sets (MS) filled out in each variety, with DM stage in brackets (asymmetric encoding experiment)

	MS 1	MS 2	MS 3	MS 4	Total
AmE (V)	11	11	10	10	42
WSAfE (V)	0	1	2	3	6
SingE (IV)	7	8	9	8	32
CSAfE (IV)	9	12	17	11	49
BSAfE (IV)	10	8	2	7	27
KenE (III)	9	10	11	9	39
Total	46	50	51	48	195

Next, Table 5.6 shows the results of the statistical analysis of the random effects (detailed results in appendix 5.2). Note that the model estimated a standard deviation of 0 for the random effect MS, which resulted in *lme4* returning the message boundary (singular fit). This is an indication that the slope “could not be estimated” by the model (Winter 2020: 259) – that is, the variance between the groups was too small for *lme4* to be able to estimate any effects. According to the *lme4* documentation, “there is not yet consensus about how to deal with singularity” (Bates et al. 2020: 50). The most appropriate approach seemed to be to remove the random effect in question: Bates, for example, notes that “[a]n estimate of 0 for [SD] does not mean that there is no variation between the groups” but rather that “[t]he estimate [...] simply indicates that the level of ‘between-group’ variance is not sufficient to warrant incorporating random effects in the model [...]” (2010: 10). Put differently, “the random effects are inert, in the sense that they have a variance of zero, and hence can be removed” (Bates 2010: 10; cf. also Pasch et al. 2013 and Barr et al. 2013). Following this approach it can be assumed that the random effect MS is not significant. It was therefore removed from the model before beginning the stepwise regression procedure.

As in the *that*-complementizer experiment, the random effect LEXICALIZATION was very significant, with a very similar *p*-value ($p=0.000001572^{***}$; *that*-complementizer experiment: $p=0.000001541^{***}$), and was therefore retained in the final model. Again, this means that the results discussed in sections 5.2.1-5.2.5 below have to be regarded with a certain measure of caution. Figures 5.27 and 5.28 illustrate the differences in variance between the random effects LEXICALIZATION (high variance, significant effect) and MS (low variance, non-significant effect).

Table 5.6 Likelihood ratio tests for random effects, and their order of elimination (asymmetric encoding experiment)

	χ^2	Elimination no.	<i>p</i> -value
MS	removed from model prior to stepwise regression (singular fit)		
SUBJECT	1.96	1	0.1614 n.s.
LEXICALIZATION	23.06	kept	<0.001***

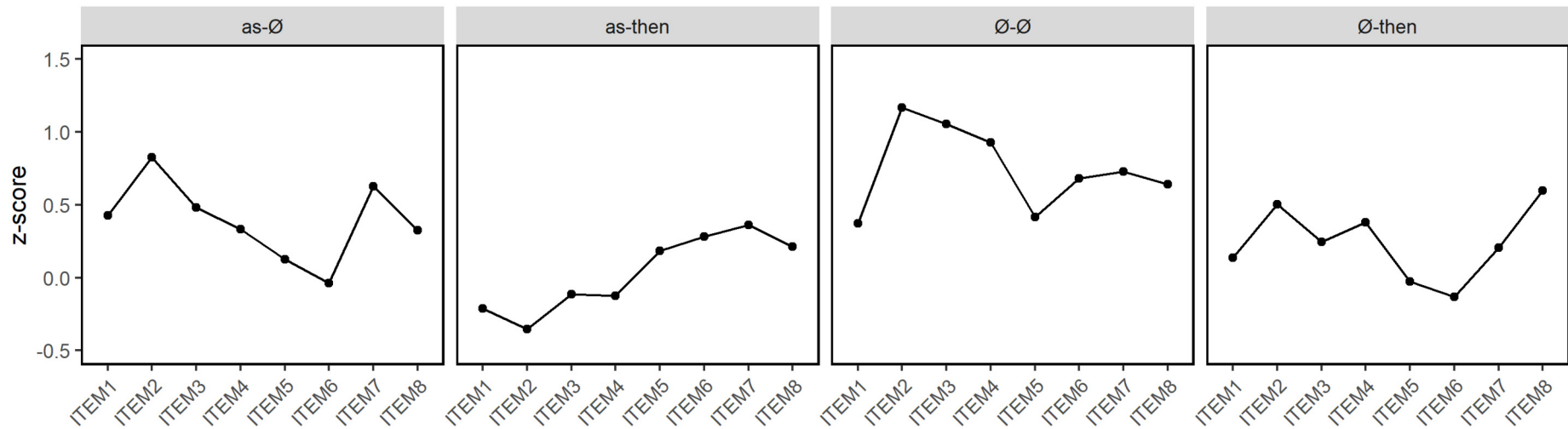


Figure 5.27 Z-score ratings of item lexicalizations grouped by factor combinations, all varieties (asymmetric encoding experiment)

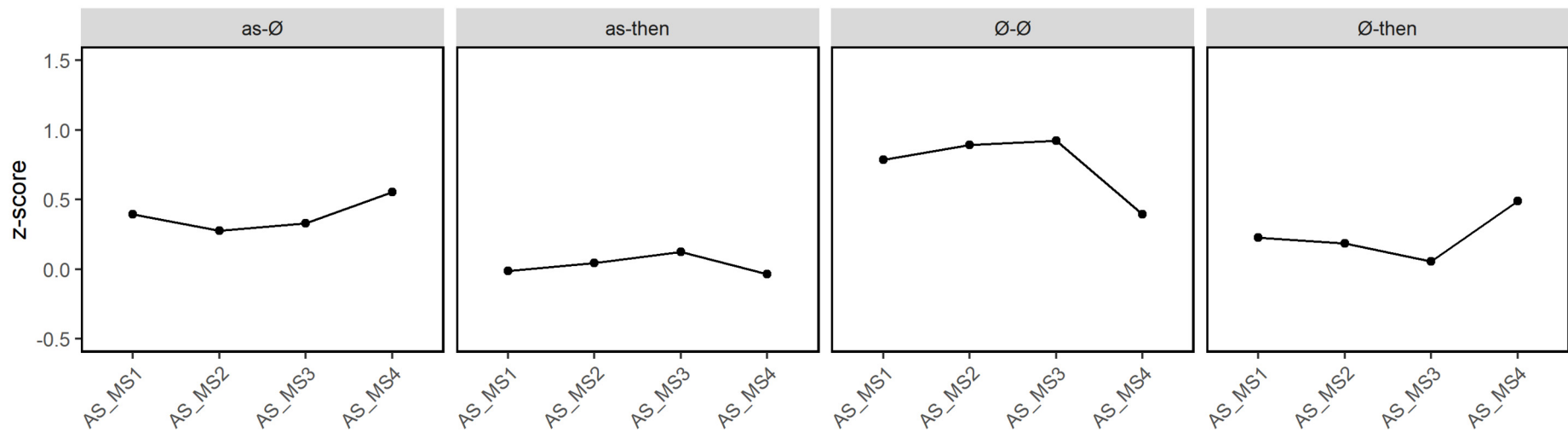


Figure 5.28 Z-score ratings of material sets grouped by factor combinations, all varieties (asymmetric encoding experiment)

Moving on to the fixed effects, Table 5.7 shows that AS_C1 ($p=0.000000000064142^{***}$) and THEN_C2 ($p=0.00000000000005197^{***}$) were very significant effects, and were therefore retained in the final parsimonious model. Unlike in the *that*-complementizer experiment (see section 5.1), it turned out that the random effect VARIETY was not significant (0.90484). Nevertheless it was kept in the final model because it was part of the significant interaction THEN_C2:VARIETY (see principle of marginality, section 2.1.2.1). In fact, this was the only interaction that turned out to be significant ($p=0.02275^*$). In other words, the stepwise regression was able to demonstrate that the two fixed effects AS_C1 and THEN_C2 (both $p<0.001^{***}$) had a very significant influence on participants' ratings of test items, and that the interaction THEN_C2:VARIETY ($p<0.05^*$) significantly influenced z-score ratings.

Model testing revealed that the final model is able to account for the data very well: The evidence ratio was 2.458029×10^{22} , which means that the evidence is strongly in favor of the final model when compared to the null model that consists of random effects only. The marginal and conditional R^2 values were 0.095 and 0.118, respectively. These comparatively small values are similar to those determined for the final model of the first experiment (0.129 and 0.148, respectively) and suggest that in general, the fixed effects only have a minor influence on the dependent variable. Again, it has to be pointed out that these rather small values must be considered against the background of the nature of the phenomenon that is being investigated: As discussed in section 5.1, syntactic variation across varieties of English has been argued to be necessarily minimal (Szmrecsányi et al. 2016: 109), as opposed to e.g. phonological variation (cf. Mair 2008: 156).

Table 5.7 F-tests for the fixed effects, and their order of elimination (asymmetric encoding experiment)

	<i>F</i>	Elimination no.	<i>p</i> -value
AS_C1:THEN_C2:VARIETY	1.40	1	0.22279 n.s.
AS_C1:VARIETY	0.78	2	0.56354 n.s.
AS_C1:THEN_C2	3.48	3	0.06238 n.s.
AS_C1	43.30	kept	<0.001***
THEN_C2	62.44	kept	<0.001***
VARIETY ²⁰	0.31	kept	0.90484 n.s.
THEN_C2:VARIETY	2.62	kept	0.02275*

In the following sections, the MET results are discussed in detail, first, by location: USA (5.2.1), South Africa (5.2.2), Singapore (5.2.3), and Kenya (5.2.4). Afterwards, the results will be compared across the six varieties, AmE, WSAfE, SingE, CSAfE, BSAfE, and KenE (5.2.5), focusing on the interaction THEN_C2:VARIETY, which stepwise regression revealed to have a significant influence on the dependent variable.

²⁰ Despite not being significant ($p>0.05$), the fixed effect VARIETY was retained in the model because it is part of the significant interaction THEN_C2:VARIETY (cf. principle of marginality, discussed in section 2.1.2.1).

5.2.1 Asymmetric encoding in American English

The pen-and-paper experiments investigating asymmetric encoding were conducted together with the other two experiments that investigated *that*-complementizers (see section 5.1) and object pronoun extraction (see section 5.3) in September 2019; for more details on the circumstances under which the experiments were carried out, cf. section 2.1.2. Thus, the circumstances under which the asymmetric encoding experiments were carried out were exactly the same (regarding e.g. participant recruitment, location, and modalities). In total, 42 participants could be recruited at the University of Texas in Austin (23 female, 19 male; age 18-26) for the second experiment.

First, the ratings of the grammatical and ungrammatical fillers will be discussed, since their means will serve as a ‘yardstick’ against which the test items are compared. Recall that in the first experiment (see section 5.1), one grammatical filler had to be excluded from the analysis because it was consistently rated worse than some ungrammatical fillers. Keeping such ‘runaways’ in the data set would have resulted in a less pronounced difference between the grammatical and ungrammatical filler mean, with implications for the interpretation of the test item ratings. As will be shown in the following, in the asymmetric encoding experiment two grammatical fillers had to be excluded from analysis for the same reasons.

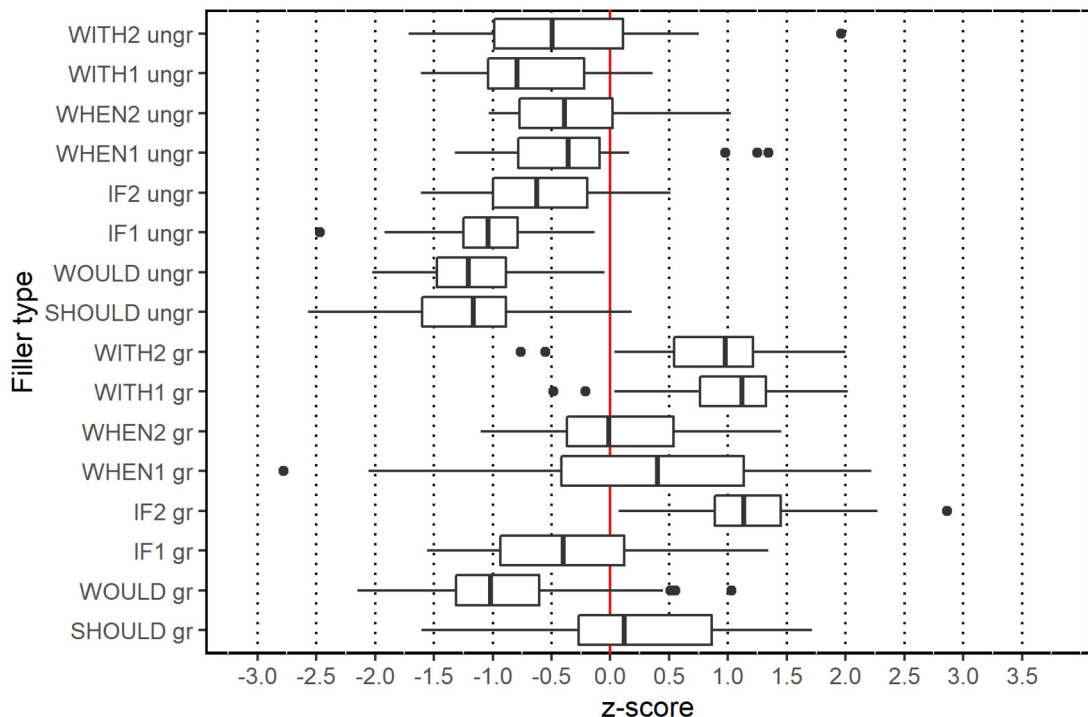


Figure 5.29 Z-scores of fillers (asymmetric encoding experiment), AmE (n=42)

Figure 5.29 presents the z-scores of each of the 16 fillers, eight ungrammatical and eight grammatical. What emerges is a picture similar to that of the first experiment: Ungrammatical fillers were rated quite consistently, evident from the proximity of the filler medians (minimum z-score median (WOULD ungrammatical): -1.207 ; maximum z-score median (WHEN1 ungrammatical): -0.356), whereas the grammatical fillers were rated considerably

more inconsistently (minimum z-score (WOULD grammatical): -1.018 ; maximum z-score (IF2 grammatical): 1.132). This is also evident from the interquartile range boxes of the grammatical fillers, which are quite large compared to their ungrammatical filler counterparts. This, together with the longer whiskers, indicates larger spreads and thus more variable ratings.

Furthermore, all ungrammatical fillers had negative z-score medians (i.e., they are located left of the red line that indicates a z-score of 0), while two grammatical fillers – IF1 grammatical (-0.399) and WOULD grammatical (-1.018) – had negative medians and thus deviated considerably from the other grammatical fillers with positive medians or a median close to 0. Incidentally, one of these two grammatical fillers with negative medians, IF1 grammatical, was also used in the first experiment and had to be excluded from the analysis for the reasons discussed in section 5.1.1. For the same reason, the other grammatical filler with a negative z-score mean, WOULD grammatical (see 5.9e above), was also excluded from analysis in all varieties (to ensure comparability). After dropping these two fillers from the analysis, the grammatical filler z-score mean increased from 0.292 to 0.535 , with a SD of 0.828 and a SE of 0.055 . The ungrammatical filler z-score mean was -0.781 , with a SD of 0.649 and a SE of 0.035 . Thus, the difference between the ungrammatical and grammatical filler means was 1.316 .

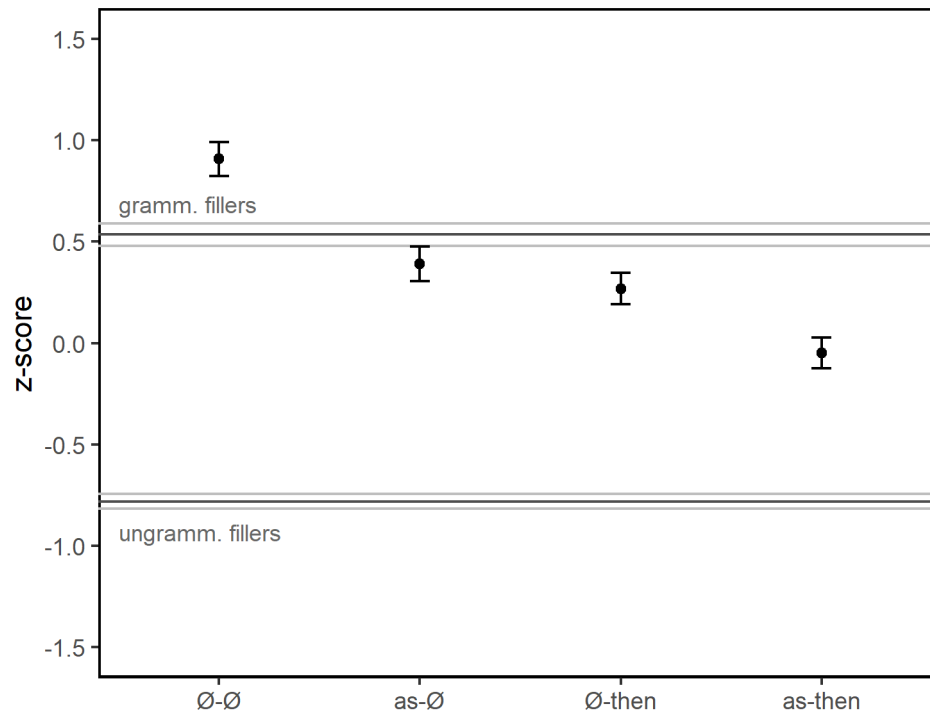


Figure 5.30 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), AmE ($n=42$)

Figure 5.30 shows the test items, plotted against the ungrammatical and grammatical filler means (rendered as black horizontal lines; gray lines indicate standard errors). The standard errors of the test items, as indicated by the error bars, were between 0.075 (*as-then*) and 0.086 (*as-Ø*). These values are very similar to those determined in the American data set of the first

experiment (*that*-complementizers), where the standard errors were between 0.072 and 0.082 (see section 5.1.1). Most notably, the plot closely resembles its counterpart from the first experiment regarding the order of rating: The highest-rated combination, with a rating that is clearly better than the grammatical filler mean, was the prototypical CC (\emptyset - \emptyset) with neither *as* in C1 nor *then* in C2 (z-score mean: 0.907; SD: 0.762, SE: 0.083). Next comes *as*- \emptyset (z-score mean: 0.391; SD: 0.788, SE: 0.086), followed by \emptyset -*then* (z-score mean: 0.268; SD: 0.721, SE: 0.079) and finally, the ‘fully asymmetric’ structure with *as-then* (z-score mean: -0.049; SD: 0.689, SE: 0.075). Unlike the *that*-complementizer experiment, however, in the American data set all combinations other than \emptyset - \emptyset received ratings worse than the grammatical filler mean, and one combination (*as-then*) was even rated negatively.

The results thus confirm the predictions outlined in section 5.2: The clear preference for the prototypical symmetric pattern underscores the paratactic nature of English CCs; the principle of iconicity does not apply to the “semantic subordination” (Hoffmann 2019: 227) of C1. Furthermore, a general pattern that was also determined in the first experiment emerges: the more extra lexical material in the construction, the worse the rating. Finally, with a negative z-score mean of -0.049, it is questionable whether the combination *as-then* can be considered part of the standard English CC network at all.

5.2.2 Asymmetric encoding in South African English

As was the case with the first experiment (*that*-complementizers), a considerably larger amount of participants could be recruited in South Africa: In total, 91 informants took part, similar to the 96 that were recruited for the first experiment. Of these 91 informants, nine were excluded from the analysis: One IndSAfE speaker, one L1 Afrikaans speaker who indicated that she identified as ‘White South African’, and seven who indicated otherwise, e.g. ‘international’ or ‘other’. Of the remaining 82 participants, 49 were CSAfE speakers (36 female, 13 male; age 18-32), and 27 BSAfE speakers (25 female, 2 male; age 18-40). The number of WSAfE speakers was considerably lower than in the other two experiments, with only six (5 female, 1 male; age 20-23), compared to 18 in the first and 15 in the third experiment. The low number of WSAfE participants meant that no material set 1 was filled out (see Table 5.5 above). This means that the results presented for WSAfE in section below must be treated with caution, as the low number of informants has implications for the informative value of the results. In the following, the results for WSAfE (section 5.2.2.1), CSAfE (section 5.2.2.2) and BSAfE (section 5.2.2.3) will be presented.

5.2.2.1 Asymmetric encoding in White South African English

Beginning with the ungrammatical and grammatical fillers, the results obtained from the six participants (five female, one male; age 20-23) who indicated that they were WSAfE speakers resemble those of the AmE data: Figure 5.31 shows that the ungrammatical fillers were rated much more consistently (minimum z-score median (SHOULD ungrammatical): -1.261, maximum z-score median (WHEN1 ungrammatical): -0.318) than the grammatical fillers (minimum z-score median (WOULD grammatical): -0.878, maximum z-score median (WITH1 grammatical): 1.286).

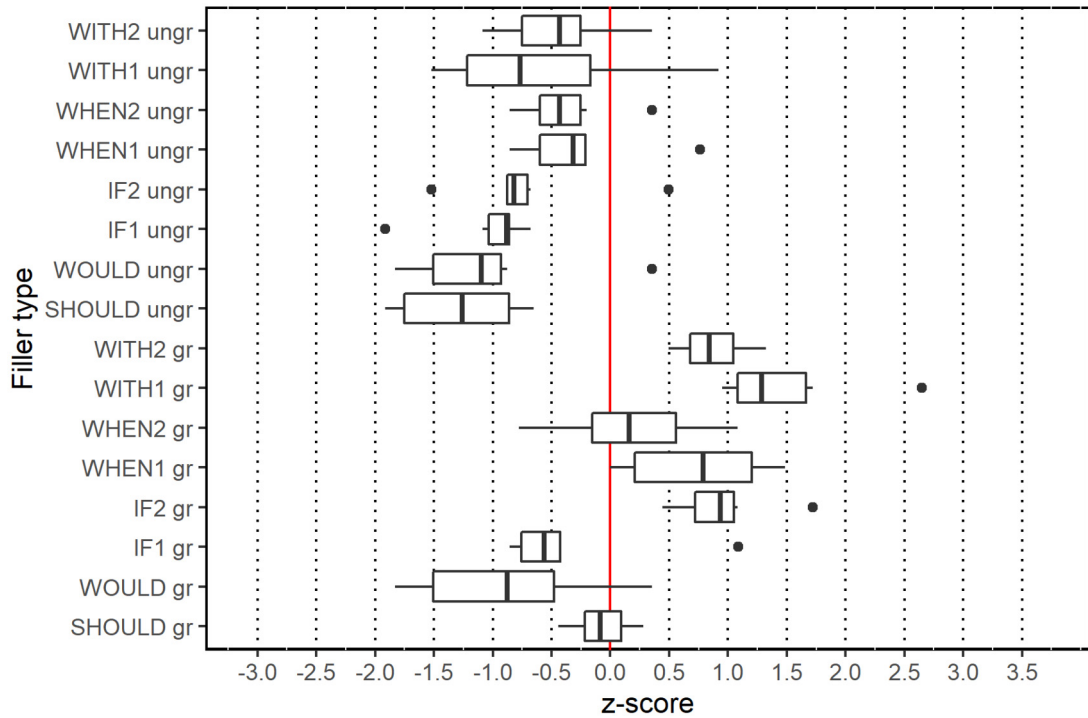


Figure 5.31 Z-scores of fillers (asymmetric encoding experiment), WSAfE (n=6)

Again, the interquartile range boxes of the grammatical fillers are larger than those of their ungrammatical counterparts, and the same two, IF1 grammatical and WOULD grammatical, had negative z-scores (-0.561 and -0.878 , respectively), further warranting their exclusion from analysis. This raised the grammatical filler mean from 0.368 to 0.643 (AmE: 0.535), with a SD of 0.702 and a SE of 0.117 . The ungrammatical filler z-score mean was -0.779 (AmE: -0.781), with a SD of 0.677 and a SE of 0.098 . Note that the relatively large standard errors (recall that the corresponding standard errors in the AmE data set were 0.055 for the grammatical fillers and 0.035 for the ungrammatical fillers) can be attributed to the small number of participants ($n=6$). The difference between the ungrammatical and grammatical filler means was 1.422 and thus, similar to that determined for the AmE data set (1.316).

The test items are also characterized by large standard errors, evident from the long error bars in Figure 5.32. Compared to the AmE data set (and the other South African data sets, discussed in sections 5.2.2.2 and 5.2.2.3 below), the WSAfE test items were rated quite differently: The most obvious difference is that the variant with neither *as* nor *then* ($\emptyset-\emptyset$) is below the grammatical filler mean (z-score mean: 0.408 ; SD: 0.999 , SE: 0.288), and was rated worse than both *as*- \emptyset (z-score mean: 0.486 ; SD: 0.787 , SE: 0.227) and \emptyset -*then* (z-score mean: 0.519 ; SD: 0.641 , SE: 0.185), if only slightly. Only *as*-*then* was rated considerably worse, well below the grammatical filler mean, with a negative z-score mean of -0.228 (SD: 1.052 , SE: 0.304). Thus, it can be concluded that apart from *as*-*then*, all combinations were considered acceptable by the WSAfE speakers.

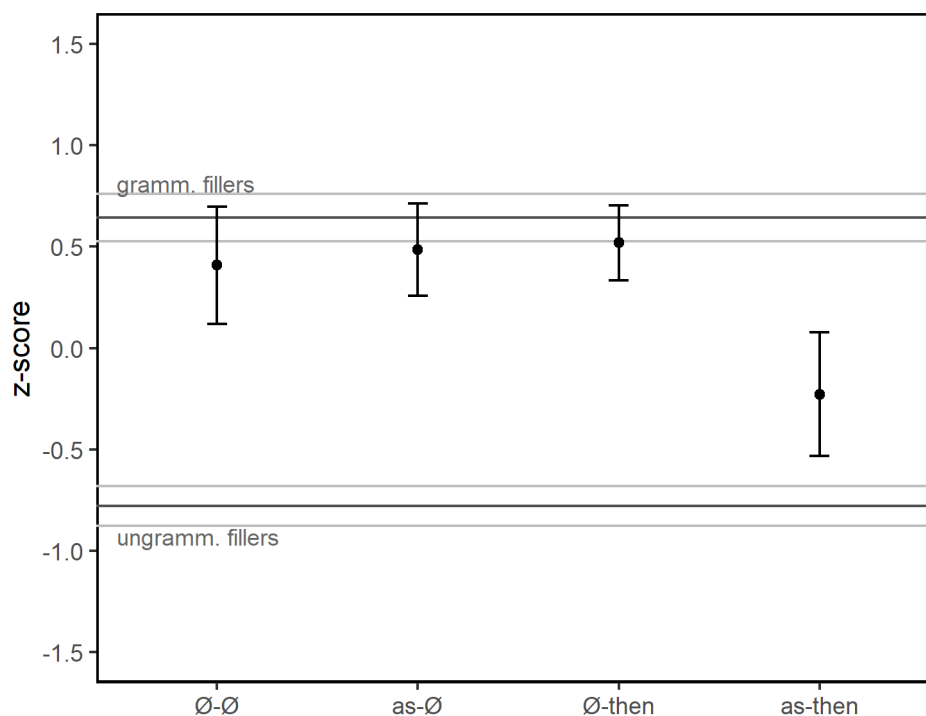


Figure 5.32 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), WSAfE ($n=6$)

These results suggest that, with the exception of *as-then*, the WSAfE participants did not differentiate between the various combinations as much as the AmE participants. Rather, it appears that the combinations \emptyset - \emptyset , *as*- \emptyset , and \emptyset -*then* were equally acceptable to them. First and foremost, this finding poses a challenge to the hypothesis that English, in particular the standard varieties, strongly prefer \emptyset - \emptyset and thus, have entrenched a symmetric pattern. However, since only six WSAfE speakers could be recruited as participants and these filled out only three material sets (see Table 5.5 in section 5.2), the comparability of these results with those from the other varieties is questionable, so that they must be regarded with a healthy dose of caution. As will become apparent, the WSAfE results deviate considerably from the other five varieties in many respects. Certainly, investigations with comparable numbers of WSAfE speakers will have to be carried out in the future to clarify the findings presented here. At this point, they can be described as *a priori* at best.

5.2.2.2 Asymmetric encoding in Coloured South African English

Figure 5.33 presents the results of the ungrammatical and grammatical fillers from the 49 participants (36 female, 13 male; age 18-32) that identified as ‘South African Coloured’. It reveals the same general tendencies as the AmE and WSAfE data sets: The ungrammatical fillers are rated more consistently (minimum z-score median (WOULD ungrammatical): -1.095, maximum z-score median (WHEN1 ungrammatical): -0.508) than the grammatical fillers (minimum z-score median (WOULD grammatical): -0.922, maximum z-score median (IF2 grammatical): 0.909). Unlike in the first experiment (see section 5.1.2.2), the

interquartile range boxes of both the ungrammatical and grammatical filler medians are smaller and thus comparable to their counterparts in the AmE data set. This suggests a more consistent rating of fillers. That is, there was less variance in respondents' judgments compared to the first experiment.

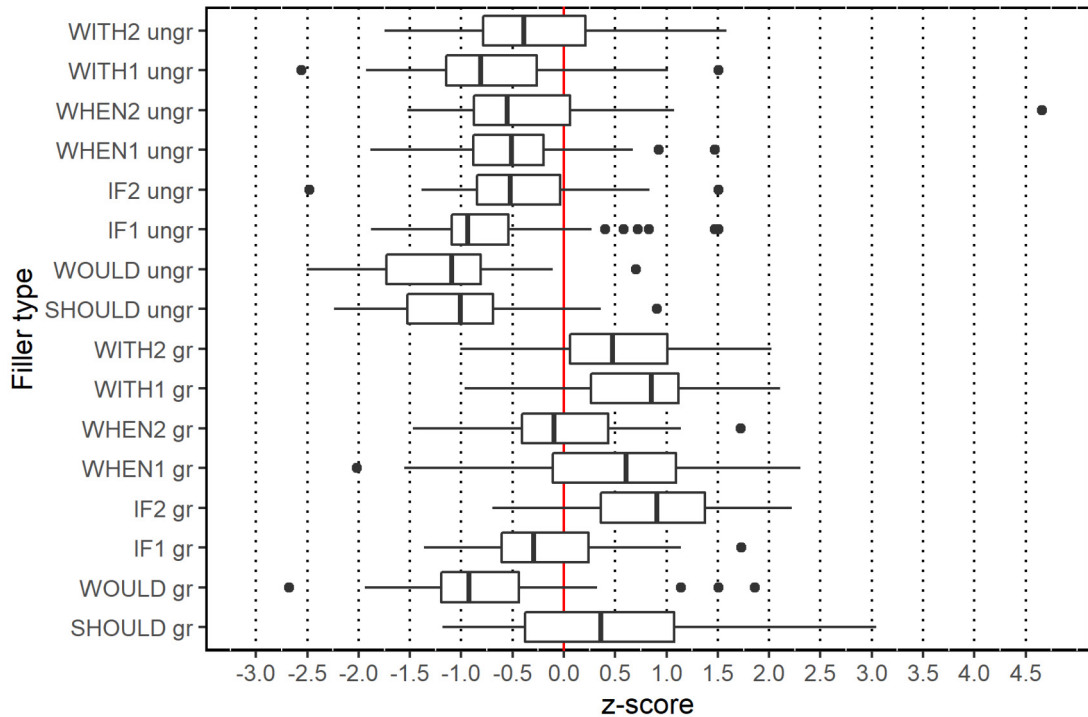


Figure 5.33 Z-scores of fillers (asymmetric encoding experiment), CSAfE ($n=49$)

As was the case with the AmE and WSAfE data sets, fillers IF1 grammatical (z-score median: -0.295) and WOULD grammatical (z-score median: -0.922) were removed from the data before proceeding with the analysis. This resulted in the grammatical filler mean increasing from 0.256 to 0.455 , with a SD of 0.810 and a SE of 0.047 ; the ungrammatical filler mean was -0.684 with a SD of 0.800 and a SE of 0.040 . The grammatical and ungrammatical filler means were thus quite comparable to those of the AmE data set (0.535 and -0.781 , respectively). The difference between the ungrammatical and grammatical filler means was slightly smaller than in the AmE data (1.316), amounting to 1.139 in the CSAfE data set.

Moving on to the test items, Figure 5.34 shows the results of the four combinations, $\emptyset-\emptyset$ (z-score mean: 0.717 ; SD: 0.944 , SE: 0.095), *as*- \emptyset (z-score mean: 0.424 ; SD: 0.776 , SE: 0.078), \emptyset -*then* (z-score mean: 0.205 ; SD: 0.789 , SE: 0.080), and *as*-*then* (z-score mean: 0.024 ; SD: 0.818 , SE: 0.083). The standard errors were thus similar to those in the AmE data set, where they were between 0.075 and 0.086 . In fact, the results mirror those of AmE data in many other ways, suggesting no variety-specific effects in the CSAfE data (recall that VARIETY did not turn out to be a significant effect): The only combination that was rated better than the grammatical fillers was the prototypical CC (i.e., $\emptyset-\emptyset$) without any extra clause-initial elements. The next best rated combination was *as*- \emptyset , followed by \emptyset -*then* and finally, *as*-*then*, which received a rating very close to 0 . It can therefore be concluded that all

combinations were rated as acceptable by the CSAfE speakers, perhaps with the exception of *as-then*, which however was still rated considerably better than the ungrammatical fillers. Again, this suggests a tendency that can be summed up as ‘the less additional lexical material, the better’ or ‘the closer to the standard CC, the better’.

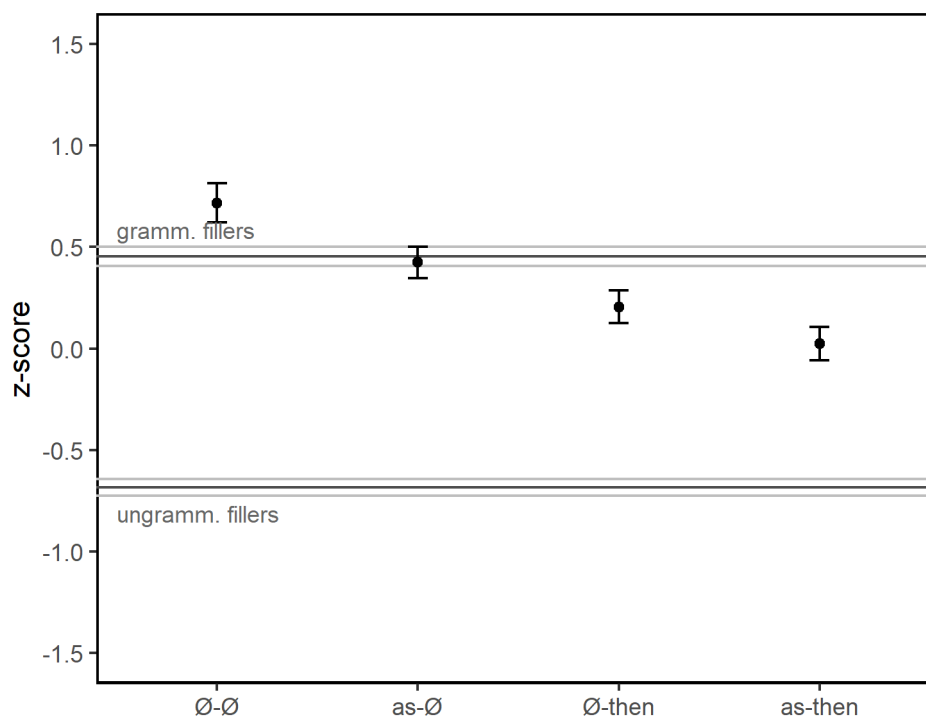


Figure 5.34 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), CSAfE ($n=49$)

5.2.2.3 Asymmetric encoding in Black South African English

Figure 5.35 presents the results of the ungrammatical and grammatical fillers that were obtained from the 27 participants (25 female, 2 male; age 18-40) that identified as ‘South African African’ and were thus assumed to be speakers of BSAfE. As in the AmE, WSAfE and CSAfE data, the ungrammatical fillers were rated more consistently (minimum z-score median (SHOULD ungrammatical): -0.994 , maximum z-score median (IF2 ungrammatical): -0.513) than the grammatical fillers (minimum z-score median (WOULD grammatical): -1.014 , maximum z-score median (IF2 grammatical): 0.922). Again, this indicates that the ungrammatical fillers were rated with less variance. Also note that the interquartile range boxes of the grammatical fillers are generally larger than those of their ungrammatical counterparts, following the pattern that has emerged from the other data sets examined so far.

Note that of the two grammatical fillers that were excluded from further analysis due to their anomalous z-scores in the other data sets, in the BSAfE data only one (WOULD gr, z-score median: -1.014) considerably deviated from the other grammatical fillers. The other such filler, IF1 grammatical, had a z-score median of only -0.014 , but was nevertheless excluded from analysis to ensure comparability between the different varieties. The result was

an increase of the grammatical filler mean from 0.155 to 0.295, with a SD of 0.860 and a SE of 0.068. The ungrammatical filler mean was -0.596 , with a SD of 0.819 and a SE of 0.056.

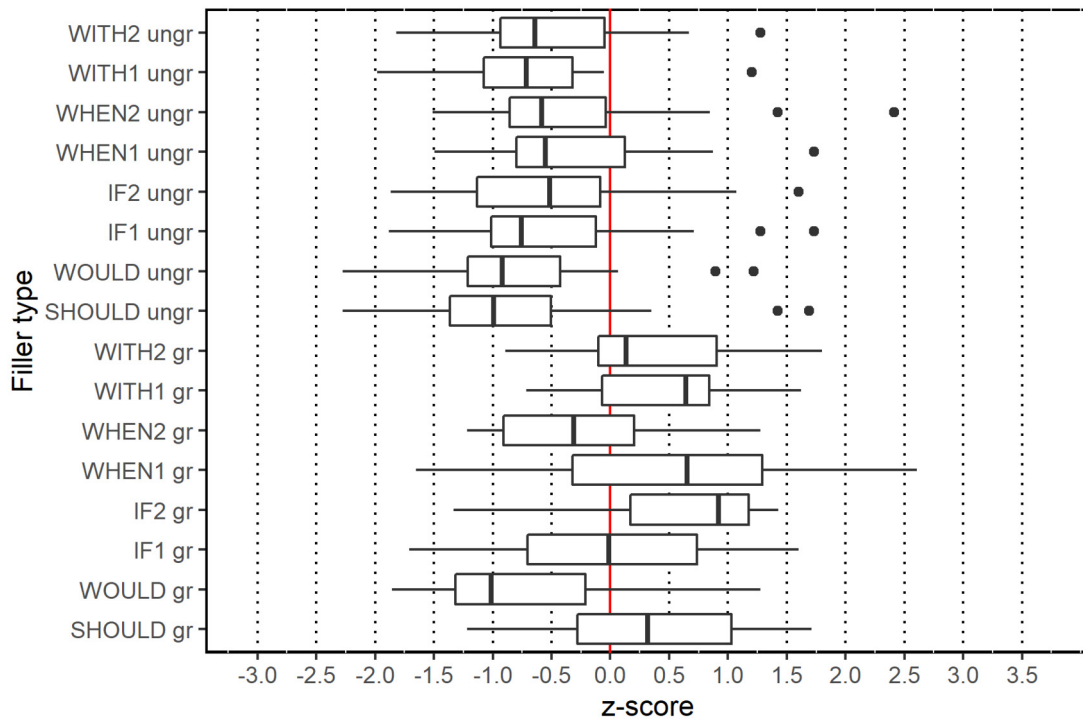


Figure 5.35 Z-scores of fillers (asymmetric encoding experiment), BSAfE ($n=27$)

While the standard deviations and standard errors are thus similar to those from the AmE and CSAfE data sets, the ungrammatical and grammatical filler means are notably different. Reflecting the BSAfE results of the first experiment (see section 5.1.2.3), the difference between the two means (0.891) is much smaller than that of the other three varieties discussed so far (AmE: 1.316, WSAfE: 1.422, CSAfE: 1.139). This is mostly due to the grammatical filler mean, which was considerably lower in the BSAfE data set (0.295 compared to 0.455 in AmE, 0.535 in CSAfE and 0.490 in SingE); although the ungrammatical filler mean also deviated somewhat (-0.596 compared to -0.781 in AmE, -0.684 in CSAfE and -0.672 in SingE). As already discussed in section 5.1.2.3, the reason for this is likely a flaw in the design of the ungrammatical filler items, which featured erroneous subject-verb agreement. This, however, is a grammatical violation to which BSAfE speakers might have been less sensitive due to BSAfE's general tendency towards variable subject-verb concord (cf. Mesthrie 2009b: 496). A similar effect was also observable in the KenE data (see section 5.2.4 below).

Continuing with the test items, Figure 5.36 presents the results of each of the four combinations. With the plot's similarity to the corresponding AmE and CSAfE plots (see sections 5.2.1 and 5.2.2.2 above), the results of the stepwise regression become apparent (see section 5.2), which revealed that the fixed effect VARIETY did not have any significant effects on the z-score. Similarities to the AmE and CSAfE data sets are thus unsurprising. Claims about cross-variety variations, such as 'deleters vs. preservers' (Mesthrie 2006, 2008a, 2012), an L1–L2 continuum (Kortmann 2014), or morphosyntactic innovations in stage III of

the DM (Schneider 2003, 2007) can therefore not be confirmed in the context of the asymmetric encoding of CCs: While all combinations received considerably better ratings than the ungrammatical fillers, there was a clear preference for \emptyset - \emptyset , i.e., the prototypical CC (z-score mean: 0.710; SD: 1.023, SE: 0.139), followed by *as*- \emptyset (z-score mean: 0.466; SD: 0.822, SE: 0.111) and \emptyset -*then* (z-score mean: 0.242; SD: 0.888, SE: 0.121).

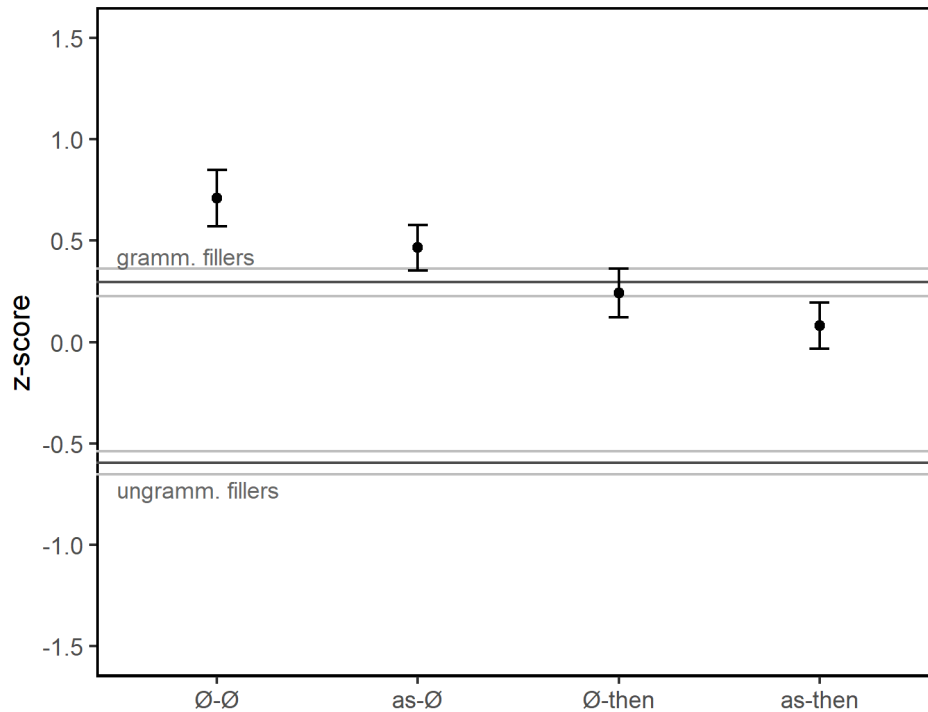


Figure 5.36 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), BSAfE (n=28)

Test items featuring *as-then* received the lowest rating, again with a z-score mean close to zero (0.080; SD: 0.838, SE: 0.114). Note, however, that in contrast to AmE and CSAfE, *as*- \emptyset was still rated better than the grammatical fillers. Overall, the results confirm the general tendency that was determined for the AmE and CSAfE data sets, i.e., ‘the less additional lexical material, the better’ or ‘the closer to the standard CC form, the better’.

Finally, Figure 5.37 offers a comparison of the three South African varieties WSAfE, CSAfE, and BSAfE. As discussed in section 5.2.2.1 above, the results obtained from the WSAfE speakers deviate considerably from the other varieties, including the South African varieties CSAfE and BSAfE.

Due to the small number of WSAfE participants (n=6), however, the results of this variety have to be taken with a grain of salt. Aside from WSAfE, the other two South African varieties, CSAfE and BSAfE, show striking similarities in the plot in Figure 5.37, again underscoring the findings from the stepwise regression (see section 5.2), which revealed that the fixed effect VARIETY did not have any significant effects. In fact, both CSAfE (z-score mean: 0.717) and BSAfE (z-score mean: 0.710) had very similar scores for the best-rated combination, \emptyset - \emptyset . The most pronounced difference in rating could be determined for the

combination *as-then*, which amounted to just 0.056 (z-score means CSAfE: 0.024; BSAfE: 0.080). In summary, then, it can be concluded that with the exception of WSAfE, the South African varieties are very homogeneous regarding the asymmetric encoding of CCs. This is not unsurprising, given Schneider's observation that the South African sub-varieties mostly differ on the level of phonology (2020: 16-17).

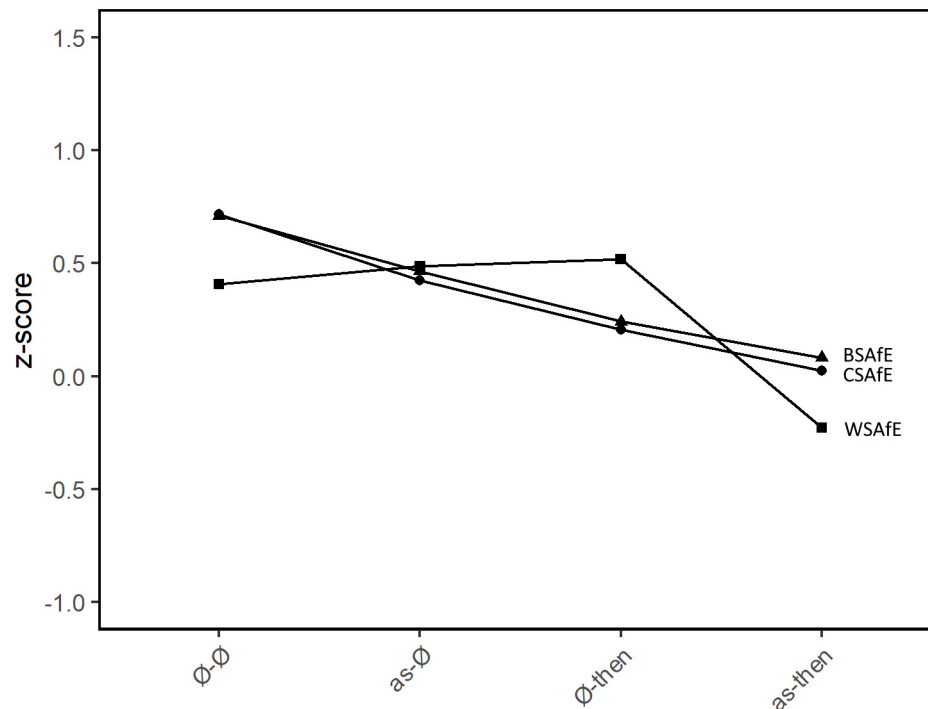


Figure 5.37 Z-scores of AS C1:THEN C2 interactions, South African varieties (asymmetric encoding experiment)

5.2.3 Asymmetric encoding in Singapore English

The experiment took place at the National University of Singapore in October 2019 under the same conditions as the other two experiments investigating *that*-complementizers (see section 5.1) and object pronoun extraction (see section 5.3). In total, 32 Singaporean participants were recruited (23 female, 9 male; age 19-24) for the second experiment.

Figure 5.38 shows the results of the individual ungrammatical and grammatical fillers, revealing many similarities to the other varieties discussed so far: The ungrammatical fillers were rated more consistently (minimum z-score median (WOULD ungrammatical): -1.170, maximum z-score median (WHEN2 ungrammatical): -0.340) than the grammatical fillers (minimum z-score median (WOULD grammatical): -1.306, maximum z-score median (WHEN1 grammatical): 1.115). The two worst-rated grammatical fillers turned out to be (as in the majority of the other data sets) IF1 grammatical (z-score median: -0.214) and WOULD grammatical (z-score median: -1.306), further justifying their exclusion from the following analyses. Subsequently, the grammatical filler mean increased from 0.226 to 0.490, with a SD of 0.821 and a SE of 0.059; the ungrammatical filler mean was -0.672 with a SD of 0.766 and a SE of 0.048. This means that the 'yardsticks' against which the test items are measured are

quite comparable to those of the AmE, WSAfE and CSAfE data sets: Both the grammatical as well as the ungrammatical filler means were reasonably close to AmE (grammatical filler mean: 0.535; ungrammatical filler mean: -0.781), WSAfE (grammatical filler mean: 0.643; ungrammatical filler mean: -0.779) and CSAfE (grammatical filler mean: 0.455; ungrammatical filler mean: -0.684) with a span between grammatical and ungrammatical filler mean of 1.162 (AmE: 1.316, WSAfE: 1.422, CSAfE: 1.139).

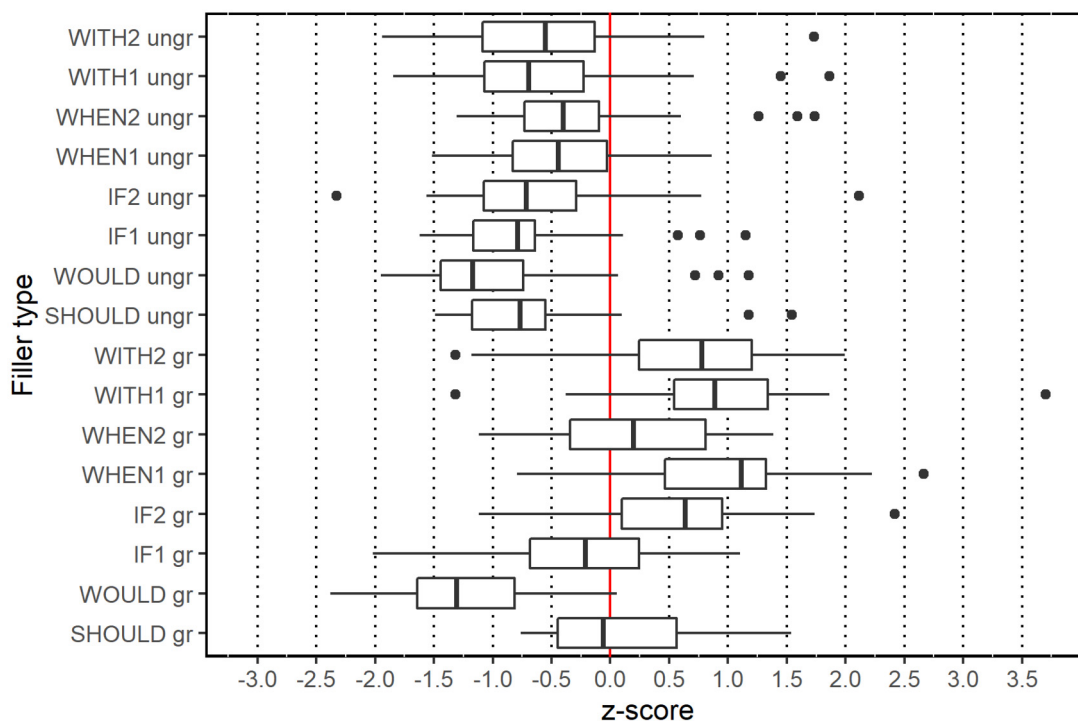


Figure 5.38 Z-scores of fillers (asymmetric encoding experiment), SingE ($n=32$)

Next, Figure 5.39 presents a plot with the test items in their various combinations. The picture is similar to those of the other varieties (with the exception of WSAfE, see section 5.2.2.1), reflecting the results of the stepwise regression (see section 5.2), which determined that the fixed effect VARIETY was not significant. Again, there is a clear preference for the prototypical CC ($\emptyset-\emptyset$) without *as* or *then*. This is also the only combination that was rated better than the grammatical fillers, with a z-score mean of 0.910 (SD: 0.954, SE: 0.119). The combination that was rated second-best was *as*- \emptyset , with a z-score mean of 0.365 (SD: 0.795, SE: 0.099). The remaining two combinations were rated quite similarly, with negative z-scores: \emptyset -*then* was rated with a z-score mean of -0.015 (SD: 0.743, SE: 0.093) and *as*-*then* with a z-score mean of -0.044 (SD: 0.780, SE: 0.097). The general tendency is thus one that reflects the findings from the other varieties discussed so far, that is, ‘the less additional lexical material, the better’ or ‘the closer to the standard CC form, the better’. Again, all combinations were rated better than the ungrammatical fillers, which implies that none of them were perceived to be ungrammatical by the Singaporean participants.

Regarding the hypotheses discussed in section 5.2, the results confirm the strong tendency towards parataxis in English CC with the clear preference for the prototypical CC form.

Furthermore, the hypothesis that there is a preference for the combination \emptyset -*then*, derived from a previous corpus study (Hoffmann 2019: 229-230) could not be confirmed. In fact, this combination was rated considerably worse in SingE (z-score mean: -0.015) than in the other varieties (AmE: 0.268; WSAfE: 0.519; CSAfE: 0.205; BSAfE: 0.242; KenE: 0.320). However, the results do provide some evidence for Mesthrie’s ‘deleters vs. preservers’ theory (2006, 2008a, 2012) – recall that according to this claim, SingE is a prototypical ‘deleter’. Indeed, the combination without any extra lexical material, \emptyset - \emptyset (z-score mean: 0.910), was rated better than in all other varieties (AmE: 0.907, WSAfE: 0.408, CSAfE: 0.717, BSAfE: 0.710, KenE: 0.580), and the remaining combinations that can be argued to be some form of what Mesthrie calls “undeletions” (2008b: 494) were all rated worse than the grammatical filler mean. In particular, the combination \emptyset -*then*, as discussed above, was rated considerably worse than in all other varieties.

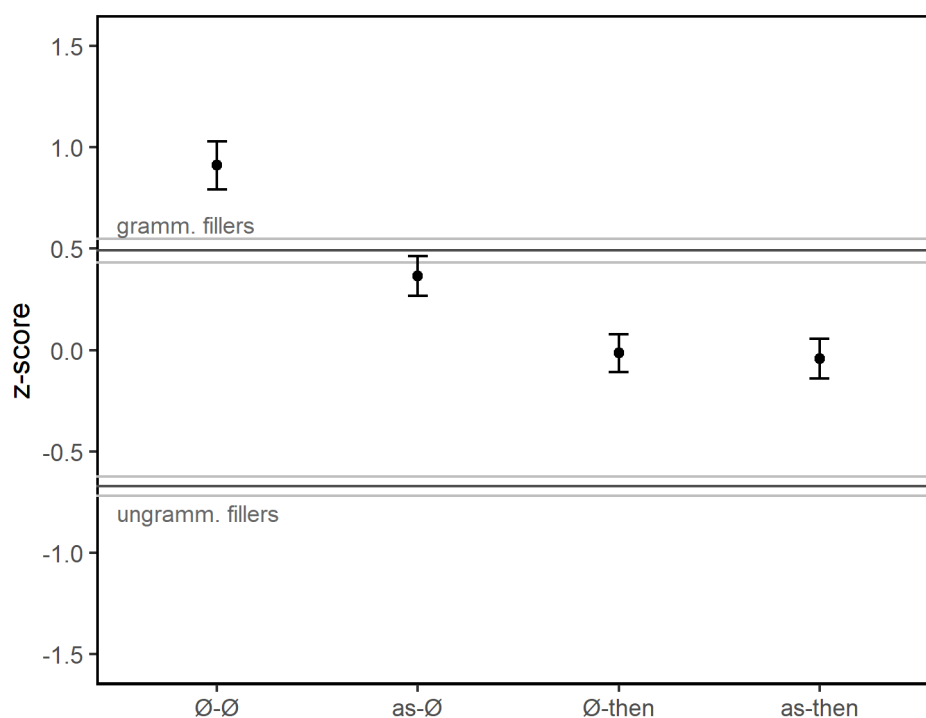


Figure 5.39 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), SingE ($n=32$)

5.2.4 Asymmetric encoding in Kenyan English

The asymmetric encoding experiment took place at the University of Nairobi in November 2019; as with the other varieties, the conditions were exactly the same as for the other two experiments. In total, 39 participants (18 female, 21 male; age 20-30) could be recruited for the second experiment in Kenya.

Figure 5.40 presents the results of each of the ungrammatical and grammatical fillers. As was the case with the other varieties, the ungrammatical fillers were rated more consistently (minimum z-score median (SHOULD ungrammatical): -0.964 , maximum z-score median (WHEN1 ungrammatical): -0.431) than the grammatical fillers (minimum z-score median

(WOULD grammatical): -0.605 , maximum z-score median (WITH2 grammatical): 0.632). Unlike the other data sets (with the exception of BSAfE, see section 5.2.2.3), only one of the two fillers that were excluded from analysis, WOULD grammatical (z-score median: -0.897), deviated considerably from the other grammatical fillers. However, in the interest of keeping results comparable, it was also removed from further analysis in the KenE data set. The resulting grammatical filler mean thus increased only slightly from 0.195 to 0.249 , with a SD of 0.875 and a SE of 0.057 . The ungrammatical filler mean was -0.531 , with a SD of 0.828 and a SE of 0.047 .

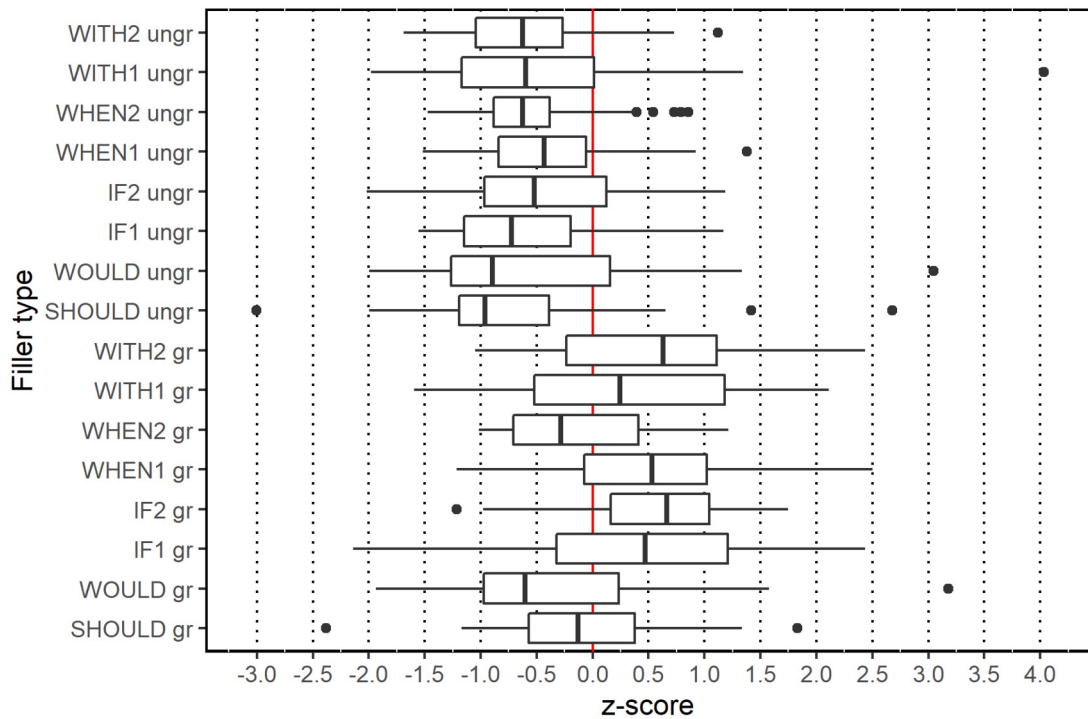


Figure 5.40 Z-scores of fillers (asymmetric encoding experiment), KenE ($n=39$)

Amounting to 0.780 , the difference between the ungrammatical and grammatical filler means was thus the smallest of all six varieties (AmE: 1.316 , WSAfE: 1.422 , CSAfE: 1.139 , BSAfE: 0.891 , SingE: 1.162). This smaller difference is due to both a higher ungrammatical filler mean and a lower grammatical filler mean compared to the other data sets. As discussed earlier (see section 5.1.4), it is likely that the design of the ungrammatical filler items (incorrect subject-verb agreement) may have resulted in the Kenyan participants being less sensitive to the violations therein. Recall that there is a general tendency in KenE towards a lack of number agreement (Buregeya 2019: 64-66). This must be kept in mind in the following, when the test item results will be discussed in relation to the ungrammatical and grammatical filler means.

Figure 5.41 shows how the test items were rated by the Kenyan participants. As in all the other varieties, the prototypical CC structure ($\emptyset-\emptyset$) was clearly rated best (z-score mean: 0.580 ; SD: 1.130 , SE: 0.128). However, there are some notable differences regarding the other three combinations: All of them were rated close to the grammatical filler mean. The combinations *as*- \emptyset (z-score mean: 0.302 ; SD: 0.950 , SE: 0.108) and \emptyset -*then* (z-score mean:

0.320; SD: 0.876, SE: 0.099) were even rated slightly better than the grammatical filler mean. Most notably, however, *as-then* (z-score mean: 0.175; SD: 0.854, SE: 0.097) was rated just slightly worse than the grammatical filler mean, whereas in all other varieties it was rated considerably worse (AmE: -0.049 , WSAfE: -0.228 , CSAfE: 0.024 , BSAfE: 0.080 , SingE: -0.044) than the grammatical filler mean as well as the remaining three options.

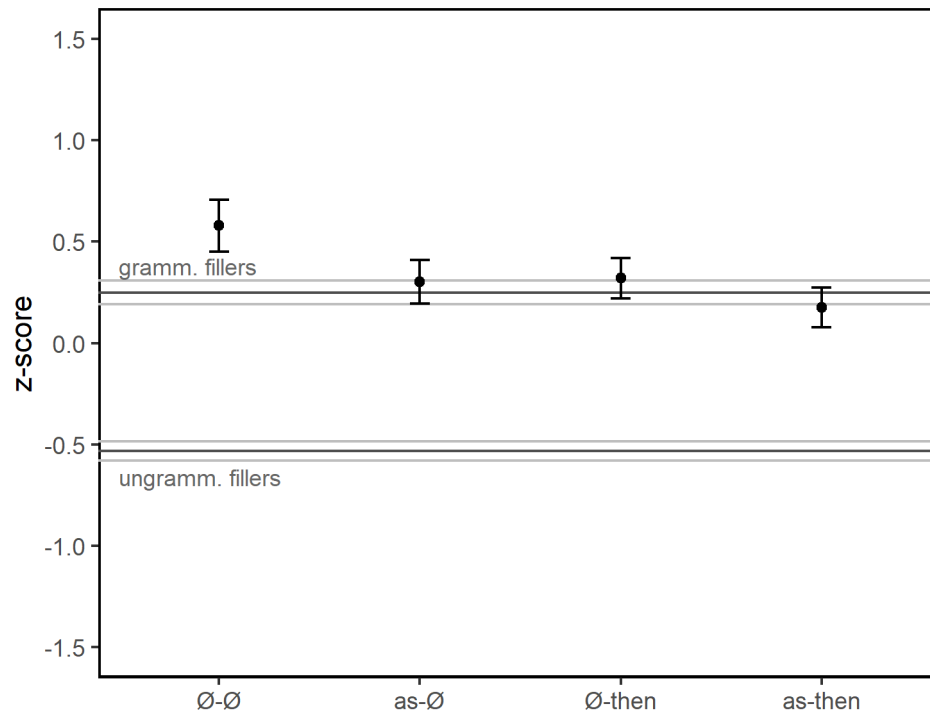


Figure 5.41 Z-scores of AS in C1 vs. THEN in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), KenE ($n=39$)

Regarding the hypotheses discussed in section 5.2, the first thing to be noted is that the KenE results confirm the trend that has crystallized from the other five varieties: a strong preference for the prototypical CC, that is, without any asymmetric encoding ($\emptyset-\emptyset$). None of the three alternatives that were tested (*as- \emptyset* , *\emptyset -then*, *as-then*) were rated anywhere close to this prototypical CC form. Furthermore, the KenE data can provide some evidence in favor of Mesthrie's 'deleters vs. preservers' claim: The combinations that feature extra material, or in other words, 'undeletions' (*as- \emptyset* , *\emptyset -then*, *as-then*), were rated considerably better than in SingE. These results can also be interpreted as evidence in favor of Kortmann's L1-L2 continuum (although the overall results notably contradict the L1-L2 continuum hypothesis, cf. section 5.2.5 below): As an L2 variety, KenE differs clearly from the L1 varieties AmE and WSAfE in that it shows a distinct preference for asymmetrically encoded structures with extra lexical material. With better ratings of innovative asymmetric CC structures, the KenE results also make a case for the Dynamic Model – after all, as the only stage III variety that was investigated, it deviated the most significantly from the other stage IV and V varieties (see the discussion in section 1.3 and 1.4 about innovation at the lexis-grammar interface in stage III of the DM).

However, all of these findings must be regarded in context of the results of the other African variety, BSAfE, whose results conform much more to those of the remaining varieties (see section 5.2.2.3). This weakens the case for both the ‘deleters vs. preservers’ as well as the L1–L2 continuum hypothesis. It is much more likely that the deviations discussed here are due to variety-specific effects, that is, features particular to KenE that may be the result of adstrate and substrate influences. Furthermore, while BSAfE is not a prototypical stage III variety, it is still considered to not have completed the transition to stage IV yet (see discussion in section 5.2.2). The BSAfE data, however, showed more similarities with the standard varieties than the KenE data set, so that the power of the evidence in support of the DM provided here is also questionable.

5.2.5 Asymmetric encoding across varieties

Although stepwise regression revealed that the fixed effect VARIETY did not have any significant influence on the outcome of the experiment (see section 5.2), a brief comparison between varieties is presented in the following, with the aim of highlighting minor differences and discussing the interaction THEN_C2:VARIETY that stepwise regression revealed to be significant.

To begin with, Figure 5.42 enables a comparison of all four tested combinations (\emptyset – \emptyset , *as*– \emptyset , \emptyset –*then*, *as*–*then*) across all varieties with the exception of WSAfE, the results of which are not taken into account due to the low number of informants (n=6) and the resulting implications for comparability (see discussion in section 5.2.2.1). While the plot shows very similar ratings for each combination across all varieties, certain tendencies do emerge. First, note how the z-score means of the prototypical CC (\emptyset – \emptyset) clearly follow a pattern that is best described as ‘the higher the DM stage, the better the z-score’ (AmE: 0.907, SingE: 0.910, CSAfE: 0.717, BSAfE: 0.710, KenE: 0.580). Conversely, test items which featured both *as*_{C1} and *then*_{C2} were rated better, the lower the DM stage (AmE: –0.049, SingE: –0.043, CSAfE: 0.024, BSAfE: 0.080, KenE: 0.175). In other words, the lower the DM stage, the less difference in rating between the prototypical CC (\emptyset – \emptyset) and the other options, in particular, *as*–*then*. This is evidence that supports the Dynamic Model in that it shows stage-specific (dis-)preferences, or in other words: The evolutionary state of varieties correlates with acceptability ratings of asymmetric encoding phenomena. Note that while the results might also be interpreted as evidence for the existence of Kortmann’s L1–L2 continuum, the effects are, in fact, reversed in this case: While Kortmann (2014) does claim the existence of a “continuum along the parameter ‘deletion vs. preservation of grammatical formatives’ on which varieties of English can be arranged” (2014: 176), the data features the *deleters* at the L1 pole (where Kortmann locates *preservers*), towards which the combination with minimal extra material (\emptyset – \emptyset) is gradually rated *better*. Of course, it must be kept in mind that the asymmetric encoding of CCs is a very specific morphosyntactic phenomenon that need not necessarily follow more general claims in the literature.

Figure 5.42 also shows that across varieties, the best-rated combination was clearly the prototypical CC without any asymmetric encoding, and that, with the exception of KenE, the order in which the remaining possibilities were rated was always the same: *as*– \emptyset followed by \emptyset –*then* and finally, *as*–*then*. As has been pointed out various times before, the findings of the

asymmetric encoding experiment are thus best summarized as follows: ‘the less additional lexical material, the better’ or ‘the closer to the standard CC form, the better’.

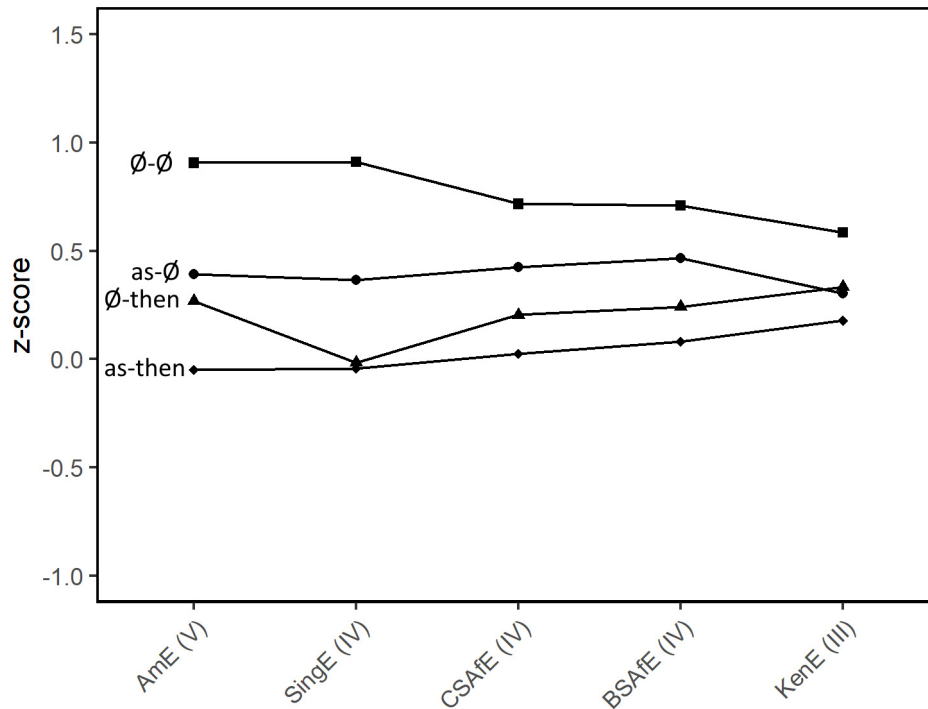


Figure 5.42 Magnitude estimation z-scores of NO AS-NO THEN (\emptyset - \emptyset), AS-NO THEN (*as*- \emptyset), NO AS-THEN (\emptyset -*then*) and AS-THEN (*as*-*then*) across varieties (without WSAfE), asymmetric encoding experiment

Next, scatter plots with superimposed linear regression lines are presented. Note that the scatter plots generally resemble those from the first experiment (cf. section 5.1.5): The clusters are relatively broad, indicating a high variance in rating by the individual subjects. Figure 5.43 shows the results for the combination without asymmetric encoding (\emptyset - \emptyset) across varieties. Note how much WSAfE deviates from the other varieties, a point discussed in more detail in section 5.2.2.1 above. The linear model in this plot shows a weak negative correlation that indicates a slightly more pronounced preference for the prototypical CC in the higher-stage varieties, a tendency already discussed in the sections above. Figures 5.46-5.62 plot the results of the remaining combinations. Reflecting the fact that the fixed effect VARIETY did not turn out to be significant, the linear models reveal little to no correlation in these plots – the only exception being the very weak positive correlation in Figure 5.62 (*as-then*), which reflects the findings discussed in the context of Figure 5.42 above, that is, test items which featured both *as*_{C1} and *then*_{C2} were rated better, the lower the DM stage.

Finally, Figure 5.47 examines the interaction THEN_C2:VARIETY, which stepwise regression revealed to be significant. Again, WSAfE was excluded (see discussion in section 5.2.2.1). Figure 5.47 shows the differences in ratings between those test items with *then*_{C2} and those without. That is, for each variety the z-score mean of items with *then*_{C2} was subtracted from those without *then*_{C2}. This shows how sensitive participants from each variety were to the presence of *then*_{C2} or, in other words, the degree to which they preferred the

absence of $then_{C2}$ over the presence of $then_{C2}$. The linear model shows a strong negative correlation, which suggests that the higher the DM stage, the higher the preference for test items without $then_{C2}$ and thus, the prototypical CC form.

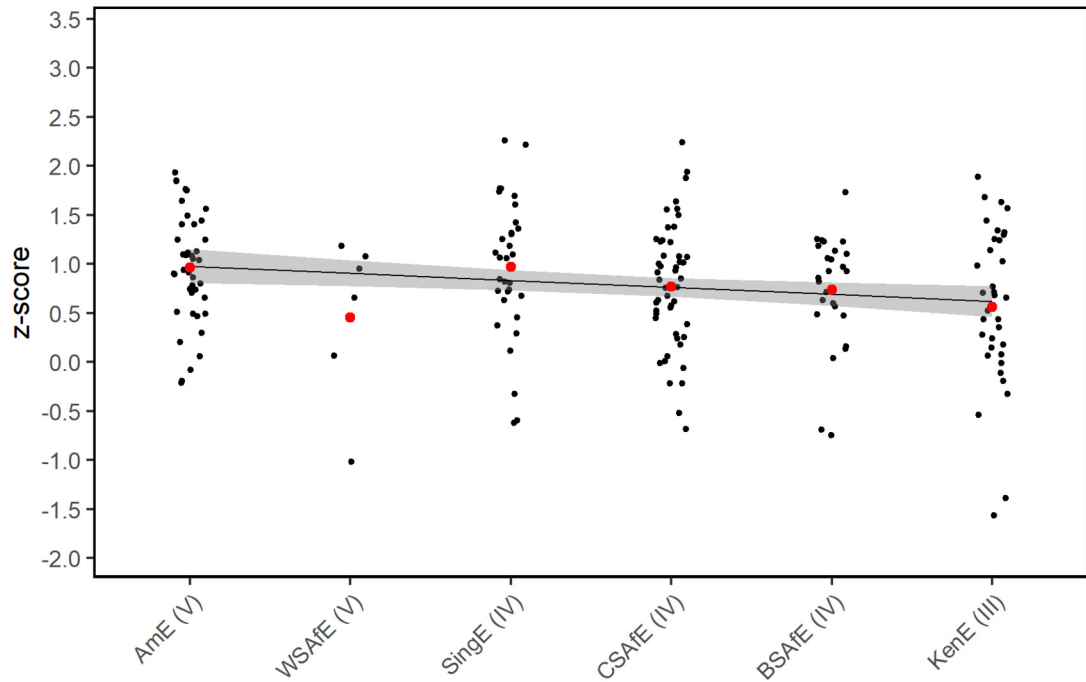


Figure 5.43 Scatter plot of z-score ratings of the combination NO AS-NO THEN ($\emptyset-\emptyset$) across varieties with superimposed linear regression line; red dots indicate variety means

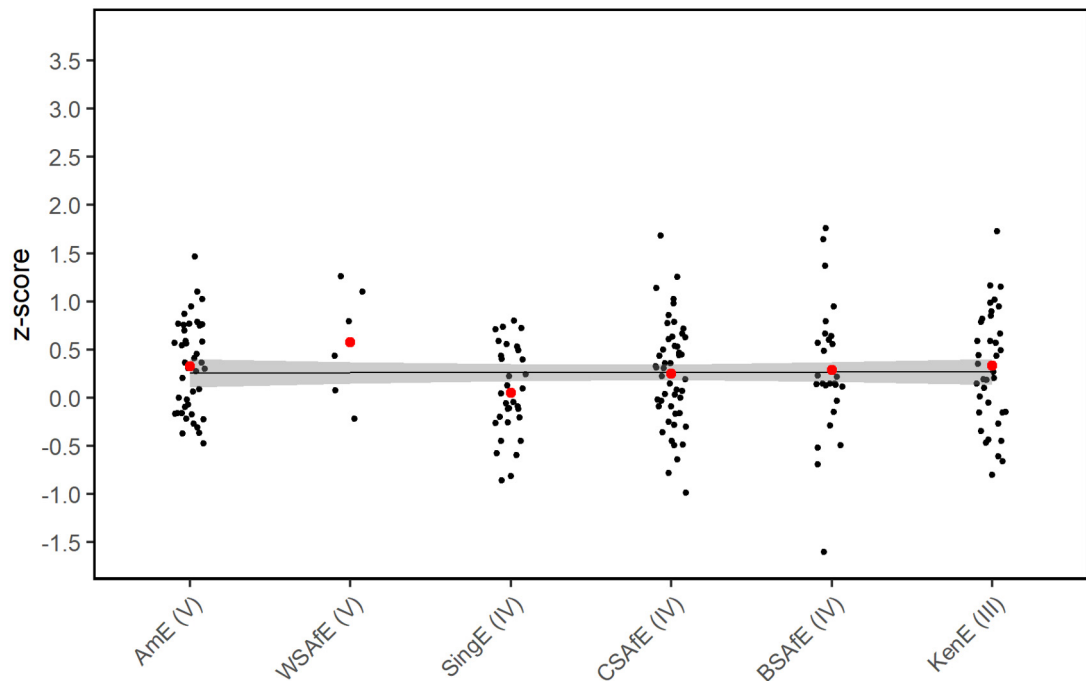


Figure 5.44 Scatter plot of z-score ratings of the combination NO AS-THEN (\emptyset -then) across varieties with superimposed linear regression line; red dots indicate variety means

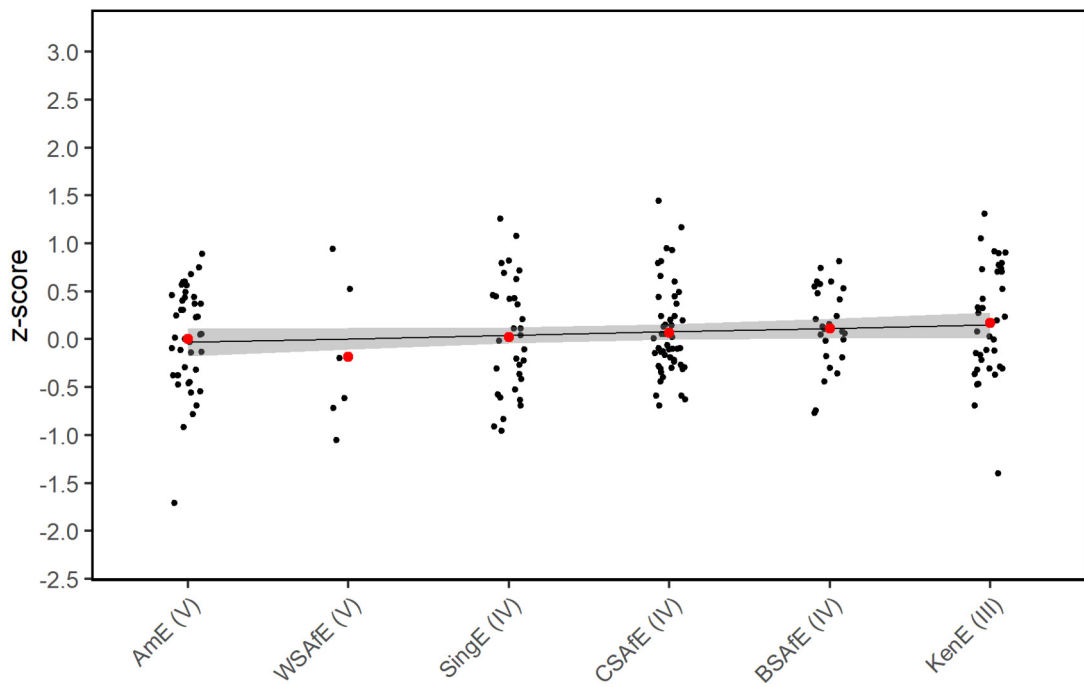


Figure 5.45 Scatter plot of z-score ratings of the combination AS-THEN (as-then) across varieties with superimposed linear regression line; red dots indicate variety means

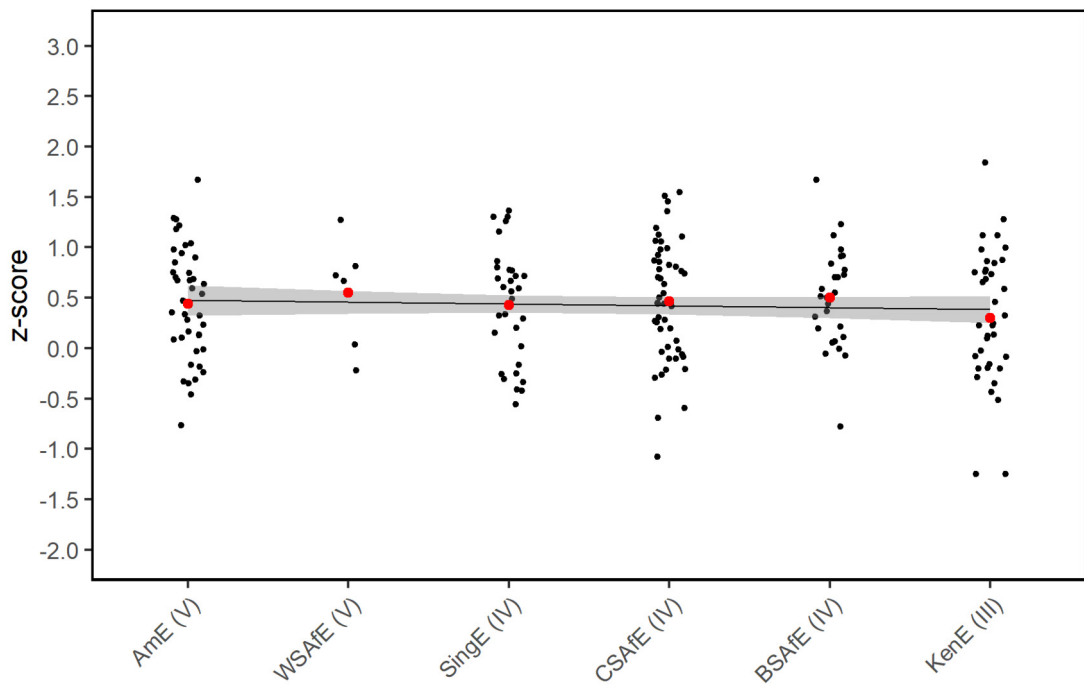


Figure 5.46 Scatter plot of z-score ratings of the combination AS-NO THEN (as-Ø) across varieties with superimposed linear regression line; red dots indicate variety means

This is evidence in support of the Dynamic Model, which posits a correlation between evolutionary stages and linguistic characteristics. In particular, the findings discussed here prove that lower DM stages, in particular stage III, are innovative regarding morphosyntax – in this case, one might interpret the results as stage III (and, to a lesser extent, stage IV) varieties being less sensitive to the creative use of *then*_{C2} in CCs, whereas the higher-stage varieties show a more pronounced preference for the prototypical CC form. Concerning Kortmann’s L1–L2 continuum (2014), the data does not provide much evidence either way: While most of the L2 varieties (CSAfE, BSAfE, KenE) are located below the L1 variety (AmE) in the plot, one L2 variety (SingE), is located above the L1 variety.

Rather, in this case the results support Mesthrie’s ‘deleters vs. preservers’ (Mesthrie 2006, 2008a, 2012) hypothesis: There is a clear geographic dichotomy between Asia (SingE) and Africa (CSAfE, BSAfE, and KenE), such that the speakers of the African varieties are less sensitive to the presence of *then*_{C2}, which can be seen as an ‘undeletions’. The SingE participants, on the other hand, were more sensitive than the AmE speakers, rating test items featuring *then*_{C2} with an even more pronounced difference against those items without *then*_{C2}.

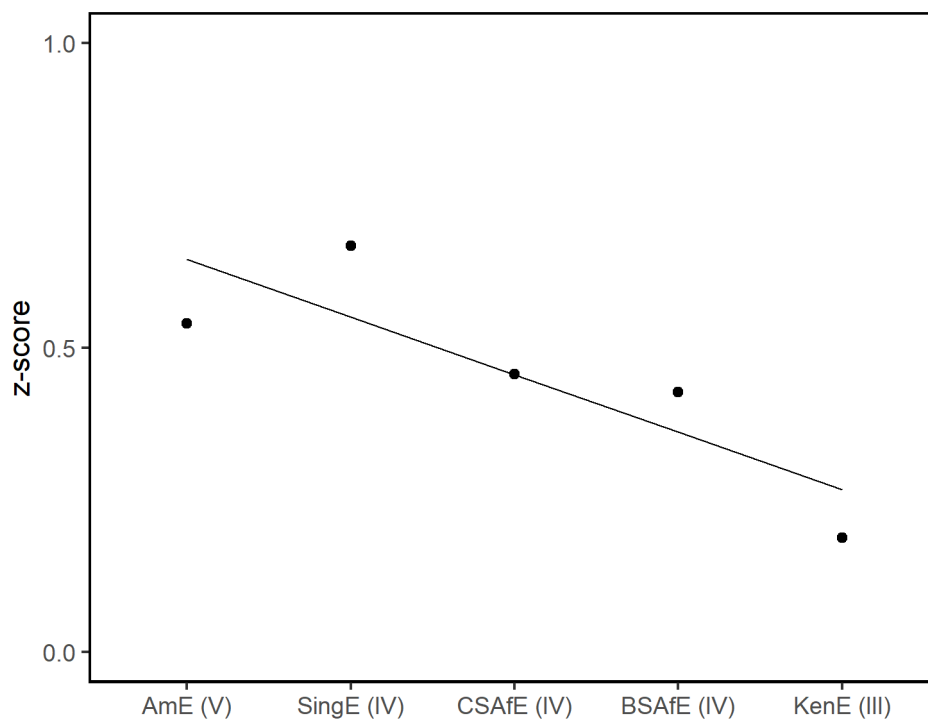


Figure 5.47 Magnitude estimation z-scores of *THEN* in C2 subtracted from z-score ratings of *NO THEN* in C2 across varieties

5.3 Object pronoun extraction

The last of the hypotactic features to be examined is object pronoun extraction from C1 and C2. Recall that, as discussed in section 3.13, the possibility of so-called across-the-board extraction (ATB) in English CCs, that is, the extraction of objects from both C1 and C2, has been used as evidence for parataxis (cf. Culicover and Jackendoff 1999: 567). Other sources

claim that ATB is merely an idiosyncrasy in English (cf. den Dikken 2005: 504), and that universally (that is, across languages), extraction is only possible from the main clause, i.e., C2. Furthermore, in the context of the latter argument, C1 has been analyzed as an adjunct clause and extraction from this clause has been claimed to be “parasitic” (den Dikken 2005: 507). Advocates of this analysis thus maintain that extraction from C1 is only possible if the object pronoun has also been extracted from the main clause C2 (den Dikken 2005: 507). This in turn implies that extraction from C1 only, with a retained (i.e., overt) object pronoun in C2 is ungrammatical.

The third experiment was designed to shed light on extraction phenomena in English CCs and resolve the disputes outlined above (and in section 3.1.3). The aim was to test the following hypotheses:

- Previous studies (e.g. Hoffmann 2019, Hoffmann et al. 2019, 2020) as well as the results from the corpus study (cf. chapter 4) and the two previous experiments (cf. sections 5.1 and 5.2) have provided substantial evidence in favor of a paratactic analysis of CCs. Regarding object pronoun extraction, this tendency will manifest itself in participants rating symmetric structures, i.e., ATB (henceforth referred to as \emptyset – \emptyset) and with both pronouns retained (henceforth referred to as OBJ–OBJ), better than asymmetric structures, i.e., with an object retained in C1 or C2 only (henceforth referred to as OBJ– \emptyset and \emptyset –OBJ, respectively);
- additionally, in accordance with Hawkins’ Minimize Domains/Minimize Forms principle (2014), which predicts that resumptive pronouns are preferred in structurally more complex environments such as embedded clauses, those structures with both object pronouns retained (OBJ–OBJ) are preferred over ATB (\emptyset – \emptyset).

Note that there has been no previous research on extraction across varieties of English. However, if there are any variety-specific effects at all, based on the literature, there are two possibilities:

- Following Mesthrie’s ‘deleters vs. preservers’ claim (2006, 2008a, 2012), speakers of the prototypical ‘preservers’ African varieties (CSAfE, BSafE, KenE) prefer structures with retained object pronouns, following the rule ‘the more, the better’. The opposite applies to the Asian variety SingE, a prototypical ‘deleter’, where ratings will be better for structures with extracted overt object pronouns, following the rule ‘the less, the better’;
- or, following Kortmann’s claim about an L1–L2 continuum (2014), speakers of the varieties located at the L1 ‘preservers’ pole (AmE and WSafE) prefer structures with retained object pronouns, whereas L2 ‘deleters’ varieties (SingE, CSAfE, BSafE, KenE) will prefer those structures with fewer retained object pronouns;

Regarding the DM, the model makes no explicit predictions about object pronoun extraction. Thus, it is not expected that stage-specific effects will crystallize.

The experiment was designed to cross the following two factors with two levels each:

- OBJ EXTRACTION C1 (levels: OBJ, NO OBJ)
- OBJ EXTRACTION C2 (levels: OBJ, NO OBJ)

Thus, as was the case in the first two experiments, all possible factor combinations resulted in $2 \times 2 = 4$ cells. Again, the aim was to have every participant rate all four of these conditions but with different lexical material each time. Unlike the first two experiments, this time only one lexicalization was created per condition, resulting in four test items. However,

because the same experiment tested a further syntactic variable with four test items²¹, eight material sets were created so that in the end, there were eight lexicalizations (of which each material set used only four for testing object pronoun extraction) (5.11):

(5.11) **OBJECT PRONOUN EXTRACTION lexicalizations**

- a. *There are folks who the more you visit (them) the more you like (them).*
- b. *There are relatives who the more you call (them) the more you annoy (them).*
- c. *This is a woman who the more you date (her) the more you fancy (her).*
- d. *There are people who the more you encounter (them) the more you loathe (them).*
- e. *This is a man who the more you question (him) the more you anger (him).*
- f. *There are kids who the more you meet (them) the more you hate (them).*
- g. *This is a girl who the more you see (her) the more you love (her).*
- h. *This is a guy who the more you know (him) the more you dislike (him).*

The eight sentences above were then modified to create all four possible factor combinations, that is: OBJ_{C1}–OBJ_{C2}; OBJ_{C1}–NO OBJ_{C2}; NO OBJ_{C1}–OBJ_{C2}; NO OBJ_{C1}–NO OBJ_{C2}. Subsequently, the resulting 32 tokens were divided into eight material sets (as discussed above) consisting of four tokens each so that each factor combination could be presented to every participant once without using the same lexicalization more than once in every material set. As an example, the items in material set 1 are shown in (5.12) below:

(5.12) **OBJECT PRONOUN EXTRACTION, Material set 1**

- a. *There are folks who the more you visit **them** the more you like **them**.*
- b. *There are relatives who the more you call the more you annoy **them**.*
- c. *This is a woman who the more you date **her** the more you fancy.*
- d. *There are people who the more you encounter the more you loathe.*

Furthermore, the experiment featured eight filler items (four grammatical and four ungrammatical), to achieve a filler:stimuli ratio of 2:1, as in the other experiments. Each set of fillers was based on conditional sentences that were embedded, similar to the CCs in the test items. The fillers were based on four patterns: AS (5.13a), IF (5.13b), WHEN (5.13c) and SHOULD (5.13c)

(5.13) **Grammatical fillers**

- a. *There are students who **as** they become busier they are more stressed.*
- b. *There are children who **if** they sleep less they cry more.*
- c. *There are parents who **when** they grow older they get wiser.*
- d. *Those are athletes who **should** they train more they will have more success.*

As in the other two experiments, the ungrammatical fillers featured erroneous subject-verb agreement such that 3rd Ps. sg. -s was either deliberately omitted (5.14 a-c) or added (5.14 d):

(5.14) **Ungrammatical fillers**

- a. *That is a boy who as **he study** harder he becomes better.*
- b. *That's an employee who if **he work** more he gets more salary.*
- c. *That's a girl who when **she read** more she knows more.*
- d. *That is a friend who **should he visits** you less you would miss him more.*

21 The experiment also tested subject extractions, the results of which will not be discussed as they are not relevant for the present study.

The eight fillers were added to the eight test items and the resulting set of 16 tokens was then randomized. Subsequently, eight material sets, each consisting of 16 tokens, were created so that each material set featured the four possible object pronoun extraction and subject pronoun extraction factor combinations (i.e., \emptyset - \emptyset , OBJ- \emptyset , \emptyset -OBJ and OBJ-OBJ; \emptyset - \emptyset , SBJ- \emptyset , \emptyset -SBJ and SBJ-SBJ) with different lexicalizations and in different places in the questionnaire. In total, there were thus eight material sets, each consisting of 12 tokens (4 test items + 8 fillers). For this experiment, which was the third to be carried out, 224 participants were recruited:

- University of Texas at Austin: 37 participants (16 female, 20 male, 1 other; age 18-22);
- University of Cape Town: 114 participants from the following sub-varieties:
 - 15 WSAfE speakers (12 female, 3 male; age 18-23)
 - 53 CSAfE speakers (39 female, 13 male, 1 ‘transfemale’; age 18-31²²)
 - 34 BSAfE speakers (25 female, 9 male; age 18-40²³)
 - 1 IndSAfE speaker (female, age 19)
 - 1 L1 Afrikaans speaker who identified as ‘White South African’ (female, age 20)
 - 10 who indicated otherwise (e.g. ‘international’, ‘other’)
- National University of Singapore: 33 participants (19 female, 14 male, age 18-24)
- University of Nairobi: 40 participants (19 female, 21 male, age 20-30²⁴)

Table 5.8 presents an overview of how many material sets were filled out in each variety. The aim was to recruit at least four participants per material set, although this number could not be reached for WSAfE, BSAfE, and SingE, for the same reasons that were outlined in section 5.1.

Table 5.8 Number of material sets (MS) filled out in each variety, with DM stage in brackets (object pronoun extraction experiment)

	MS 1	MS 2	MS 3	MS 4	MS 5	MS 6	MS 7	MS 8	Total
AmE (V)	4	5	4	4	4	5	6	5	37
WSAfE (V)	2	1	2	1	4	1	3	1	15
SingE (IV)	4	2	4	3	5	5	5	5	33
CSAfE (IV)	6	6	10	6	6	6	4	9	53
BSAfE (IV)	5	5	2	7	3	4	5	3	34
KenE (III)	5	6	5	4	5	5	5	5	40
Total	26	25	27	25	27	26	28	28	212

Next, Table 5.9 presents the results of the statistical analysis of the random effects using stepwise regression (detailed results in appendix 5.3). Note that the model estimated a standard deviation of 0.0 for the random effect SUBJECT, returning the message boundary (*singular fit*). It was decided to proceed the same way as previously (see section 5.2), that is, this particular random effect was removed from the model before beginning the

22 One participant aged 31, the remaining between 18-23.

23 One participant aged 40, the remaining between 18-23.

24 One participant aged 30, the remaining between 20-27.

stepwise regression procedure. As Table 5.9 shows, of the two remaining random effects, MS (material set) was not significant, while LEXICALIZATION was very significant ($p=0.004073^{**}$), reflecting the results of the first two experiments (see sections 5.1 and 5.2) where LEXICALIZATION also turned out to be a very significant random effect (asymmetric encoding experiment: $p=0.000001572^{***}$; *that*-complementizer experiment: $p=0.000001541^{***}$). This random effect was therefore retained in the final model. As was the case with the other two experiments, this means that the results discussed in sections 5.3.1-5.3.5 have to be taken with the proverbial grain of salt. The differences in variance between the random effects LEXICALIZATION (high variance, significant) and MS (low variance, non-significant) are illustrated in Figures 5.48-5.49.

Concerning the fixed effects, Table 5.10 presents the results of the stepwise regression. Unlike the first two experiments, only one fixed effect (OBJ_C2, $p = 0.003693^{**}$) and one interaction (OBJ_C1:OBJ_C2, $p = 0.00000000009312^{***}$) emerged as significant. That is, there were no variety-specific effects at all, not even as part of an interaction (as was the case in the second experiment, cf. section 5.2). Put differently, only the fixed effect OBJ_C2 and the interaction OBJ_C1:OBJ_C2 had a significant effect on participant's ratings and were therefore retained in the final, parsimonious model, as was the fixed effect OBJ_C1 due to the principle of marginality (cf. section 2.1.2.1).

Table 5.9 Likelihood ratio tests for random effects, and their order of elimination (object pronoun extraction experiment)

	χ^2	Elimination no.	<i>p</i> -value
SUBJECT	removed from model prior to stepwise regression (singular fit)		
MS	1.02	1	0.31282 n.s.
LEXICALIZATION	8.25	kept	<0.01**

Model testing showed that the final model can account very well for the data: The evidence ratio was 786,672,649, which amounts to evidence strongly in favor of the final model when it is compared to the null model, which consists of random effects only. The marginal and conditional R^2 values were 0.060 and 0.083, respectively, and thus even lower than those of the first two experiments (0.129/0.148 (*that*-complementizers), 0.095/0.118 (asymmetric encoding)). Again, it has to be pointed out that these small values indicate that the fixed effects only influence the dependent variable to a small degree, although this was expected (see discussion in section 5.1).

In the following, the results of the object pronoun extraction experiment are discussed in more detail, by location (USA (5.3.1), South Africa (5.3.2), Singapore (5.3.3), Kenya (5.3.4)) and then with a focus on comparing the results between varieties (5.3.5). Note, however, that differences between varieties will be minimal at best, since the fixed effect VARIETY did not emerge as significant in any way (see above).

Table 5.10 F-tests for the fixed effects, and their order of elimination (object pronoun extraction experiment)

	<i>F</i>	Elimination no.	<i>p</i> -value
OBJ_C1:OBJ_C2:VARIETY	0.535	1	0.74958 n.s.
OBJ_C2:VARIETY	0.340	2	0.88850 n.s.
OBJ_C1:VARIETY	0.761	3	0.57803 n.s.
VARIETY	1.929	4	0.08719 n.s.
OBJ_C1 ²⁵	3.768	kept	0.05259 n.s.
OBJ_C2	8.476	kept	0.003693**
OBJ_C1:OBJ_C2	43.057	kept	<0.001***

5.3.1 Object pronoun extraction in American English

To investigate object pronoun extraction in American English, pen-and-paper experiments were carried out in September 2019 at the University of Texas at Austin together with the other two experiments under the same conditions (see sections 2.1.2 and 5.1 for a more detailed account). In total, 37 participants were recruited for the third experiment (16 female, 20 male, 1 other; age 18-22).

To begin with, the grammatical and ungrammatical fillers will be discussed in more detail, as their means will later serve as ‘yardsticks’ against which test items are compared. The z-scores of each of the eight fillers – four ungrammatical and four grammatical – are shown in Figure 5.50. With the exception of SHOULD grammatical (which is discussed in more detail below), the ungrammatical fillers were rated quite consistently (minimum z-score median (SHOULD ungrammatical): -1.303 ; maximum z-score median (AS ungrammatical): -0.465). The same applies to the grammatical fillers (minimum z-score median (IF grammatical): 0.733 ; maximum z-score median (WHEN grammatical): 0.895). The interquartile range boxes of the fillers are also reasonably small (again, with the exception of SHOULD grammatical), indicating less variance in rating compared to their counterparts in the first two experiments (cf. e.g. sections 5.1.1 and 5.2.1). Also note that there were only four outliers, which further suggests that participants rated the filler items relatively consistently. As was the case with the first two data sets (see sections 5.1.1 and 5.2.1), one of the fillers, SHOULD grammatical (see 5.13d above), had to be dropped from further analysis because it deviated considerably from the other grammatical fillers, with a z-score median of -0.414 . A glance at the plot shows that this value was very close to that of the best-rated ungrammatical filler, AS ungrammatical (z-score median: -0.465). SHOULD grammatical was also rated considerably worse than the other grammatical fillers in the other varieties (with the exception of WSAfE, see section 5.3.2.1 below).

²⁵ Despite not being significant ($p > 0.05$), the fixed effect OBJ_C1 was retained in the model because it is part of the significant interaction OBJ_C1:OBJ_C2 (cf. principle of marginality, discussed in section 2.1.2.1).

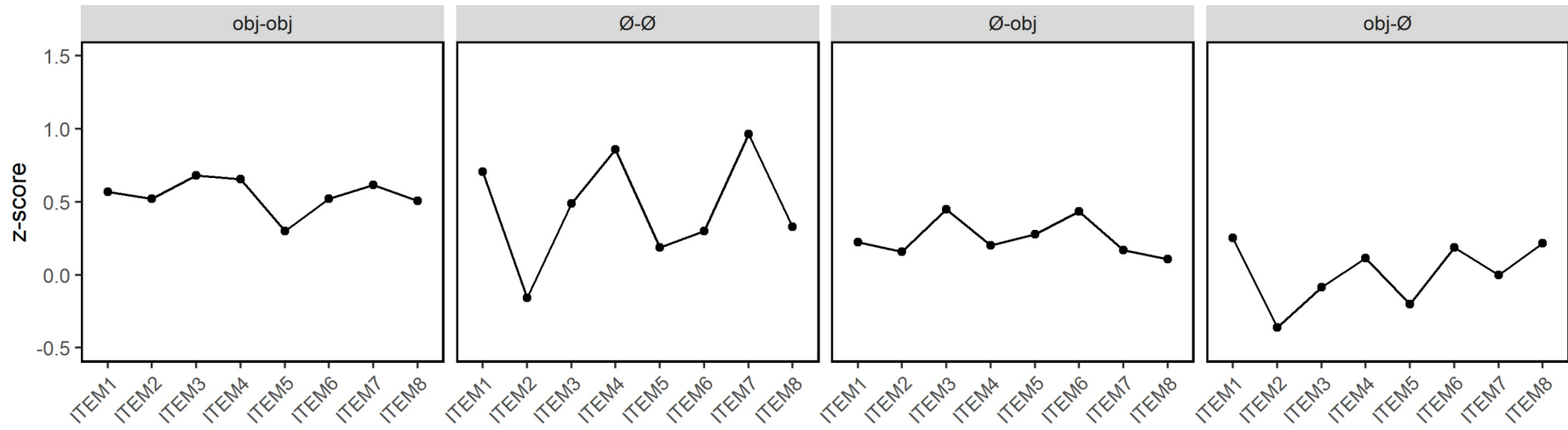


Figure 5.48 Z-score ratings of item lexicalizations grouped by factor combinations, all varieties (object pronoun extraction experiment)

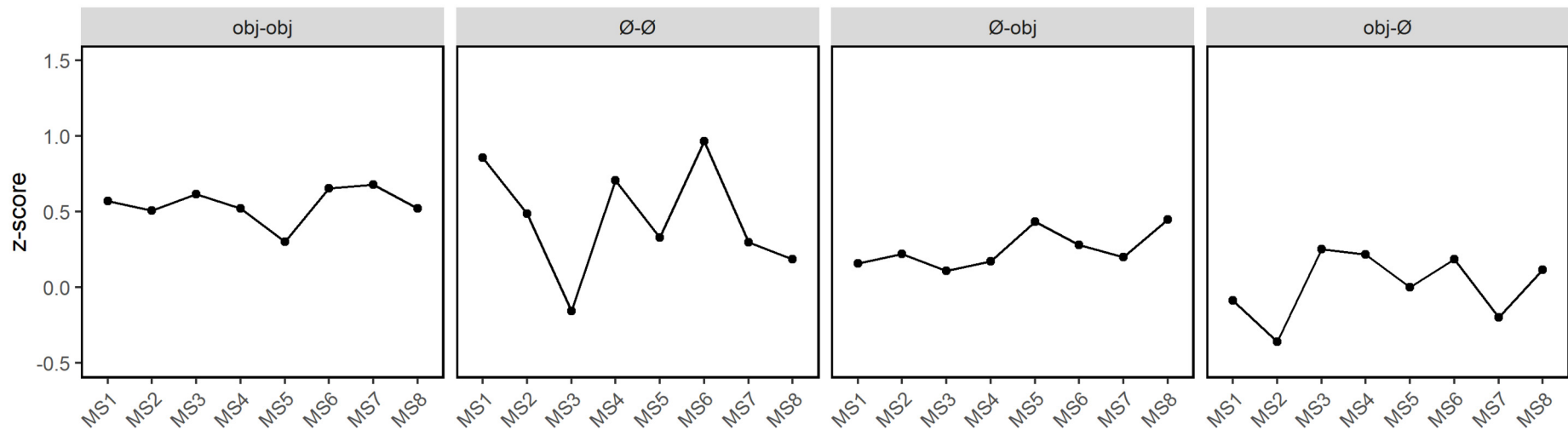


Figure 5.49 Z-score ratings of material sets grouped by factor combinations, all varieties (object pronoun extraction experiment)

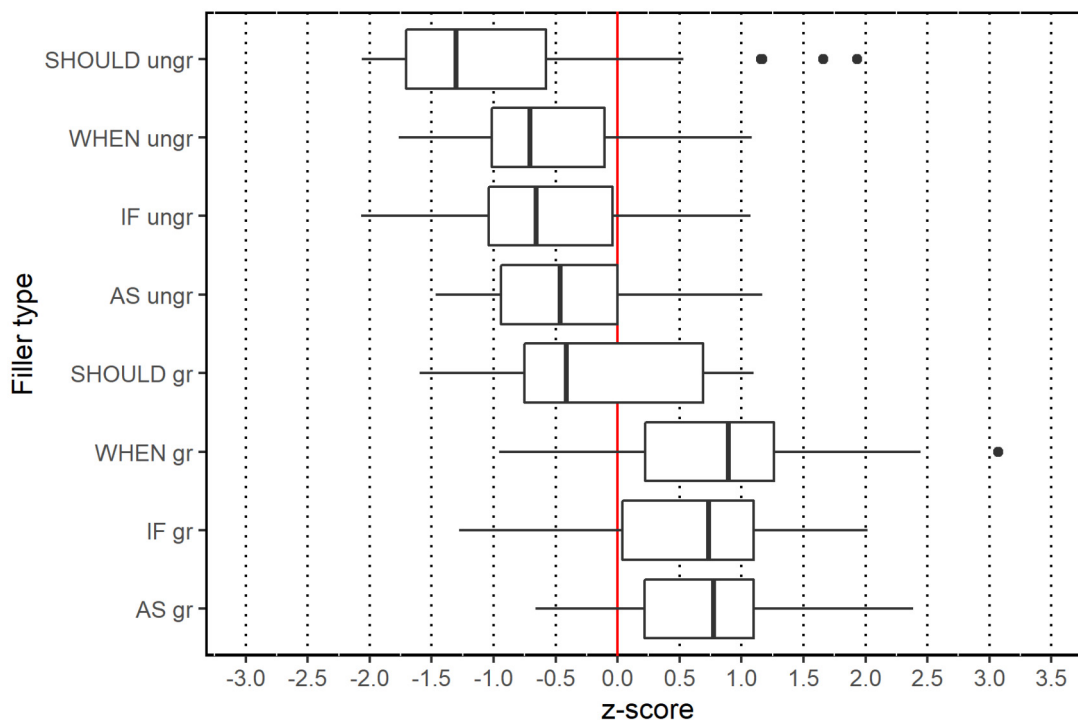


Figure 5.50 Z-scores of fillers (object pronoun extraction experiment), AmE (n=37)

After dropping filler SHOULD grammatical from the data, the grammatical filler z-score mean increased from 0.480 to 0.683, with a SD of 0.756 and a SE of 0.072. The ungrammatical filler z-score was -0.646 , with a SD of 0.792 and a SE of 0.065. The difference between the ungrammatical and grammatical filler means was thus 1.329, very similar to that in the asymmetric encoding experiment, 1.316 (cf. section 5.2.1).

Continuing with the test items, the plot in Figure 5.51 shows that all combinations were rated considerably better than the ungrammatical filler mean (z-score: -0.646). This indicates that the participants did not judge any of the test items to be ungrammatical, which has serious implications for den Dikken's 'parasitic gap' theory (2005) and thus, claims about hypotaxis: If extraction from C1 were indeed dependent on extraction from C2, as posited by the 'parasitic gap' hypothesis, then those test items with an extracted object pronoun from C1 only (\emptyset -OBJ) should have been rated as ungrammatical. However, these items were rated even better (z-score mean: 0.307; SD: 0.695, SE: 0.114) than those which featured extraction from C2 only (OBJ- \emptyset), which were rated with a z-score mean of -0.008 (SD: 0.769, SE: 0.126). Yet it is this combination (i.e., \emptyset -OBJ) that, under the 'parasitic gap' approach, should have been rated as ungrammatical. The data presented here thus means that claims about universal hypotaxis in CCs have to be reconsidered – either such that English is indeed idiosyncratic in this respect, as suggested by den Dikken (2005: 507) or that there simply is no universal rule, with languages 'oscillating' between the asymmetric (hypotactic) and symmetric (paratactic) encoding of the CC. As will be discussed in chapter 6, there is an overwhelming amount of evidence pointing towards the latter option.

Moving on to the remaining combinations, the best-rated combination was that with overt object pronouns in both C1 and C2 (OBJ-OBJ) with a z-score mean of 0.652 (SD: 0.684, SE:

0.113), followed by ATB extraction (\emptyset – \emptyset) with a z-score mean of 0.500 (SD: 0.915, SE: 0.150). Note that none of the test items were rated better than the grammatical fillers (z-score mean: 0.683). Nevertheless, the fact that the symmetric combinations, OBJ–OBJ and \emptyset – \emptyset were rated better than the asymmetric ones is further evidence in favor of a paratactic analysis of English CCs, confirming the first hypothesis outlined in section 5.3 above. That is, of the four possible combinations, the symmetric ones are clearly entrenched more deeply. It is plausible that, as was discussed in the context of the cross-clausal associations uncovered in the corpus study (see chapter 4), there is an interdependence of C1 and C2 regarding object pronoun extraction, pointing to the existence of corresponding meso-constructions. Furthermore, these findings support Hoffmann et al.’s claim about “a constraint that cannot be captured by any [...] analyses of CCs that treat the two daughter nodes (C1 and C2) as independent slots” (2019: 7). The results also confirm the prediction that, in line with Hawkins’ Minimize Domains/ Minimize Forms principle (2014), structures with both object pronouns retained (OBJ–OBJ) are preferred over ATB (\emptyset – \emptyset).

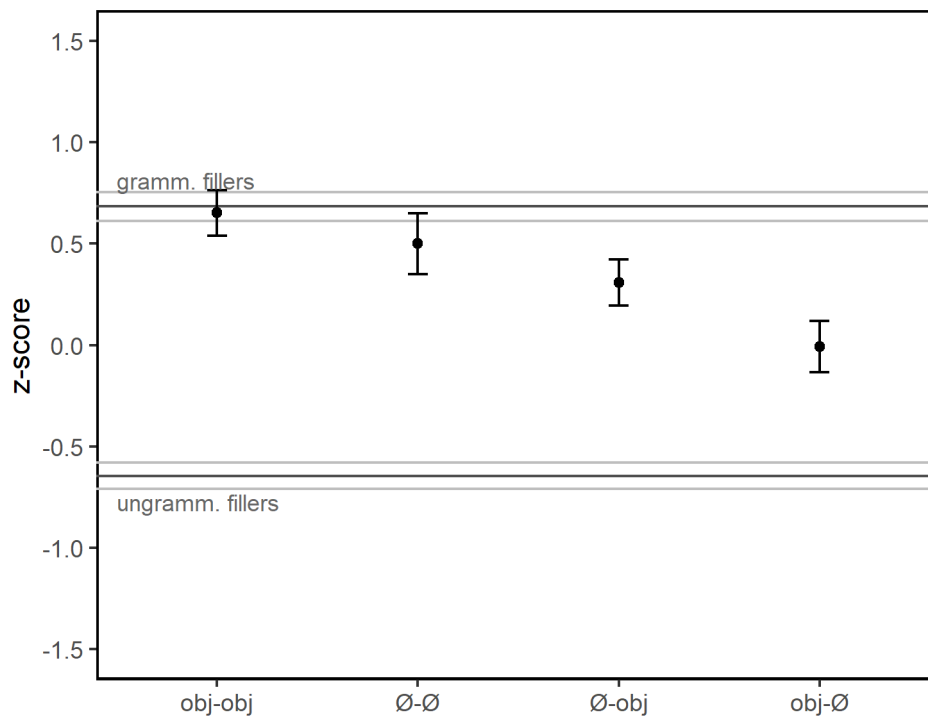


Figure 5.51 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), AmE (n=37)

5.3.2 Object pronoun extraction in South African English

Similar to the first two experiments, more participants were recruited in South Africa compared to the other locations. Of the 114 South African participants, 12 were excluded from the analysis: One IndSAfE speaker, one L1 Afrikaans speaker who identified as ‘South African White’, and 10 who indicated otherwise (e.g. ‘international’, ‘other’). The remaining 102 participants were grouped as follows: 15 WSAfE speakers (12 female, 3 male; age 18-

23), 53 CSAfE speakers (39 female, 13 male, 1 ‘transfemale’; age 18-31²⁶), and 34 BSAfE speakers (25 female, 9 male; age 18-40²⁷). In the following, the results for WSAfE (section 5.3.2.1), CSAfE (section 5.3.2.2) and BSAfE (section 5.3.2.3) will be presented.

5.3.2.1 Object pronoun extraction in White South African English

Taking a look at the results of the individual fillers in Figure 5.52, the WSAfE data set shows a clearer distinction between ungrammatical and grammatical fillers than the AmE data set (cf. section 5.3.1): Filler SHOULD grammatical was rated with a positive z-score median of 0.311. Recall that in the AmE data, this filler had a negative z-score of -0.414 and was dropped from further analysis because it deviated considerably from the other (positively rated) grammatical fillers.

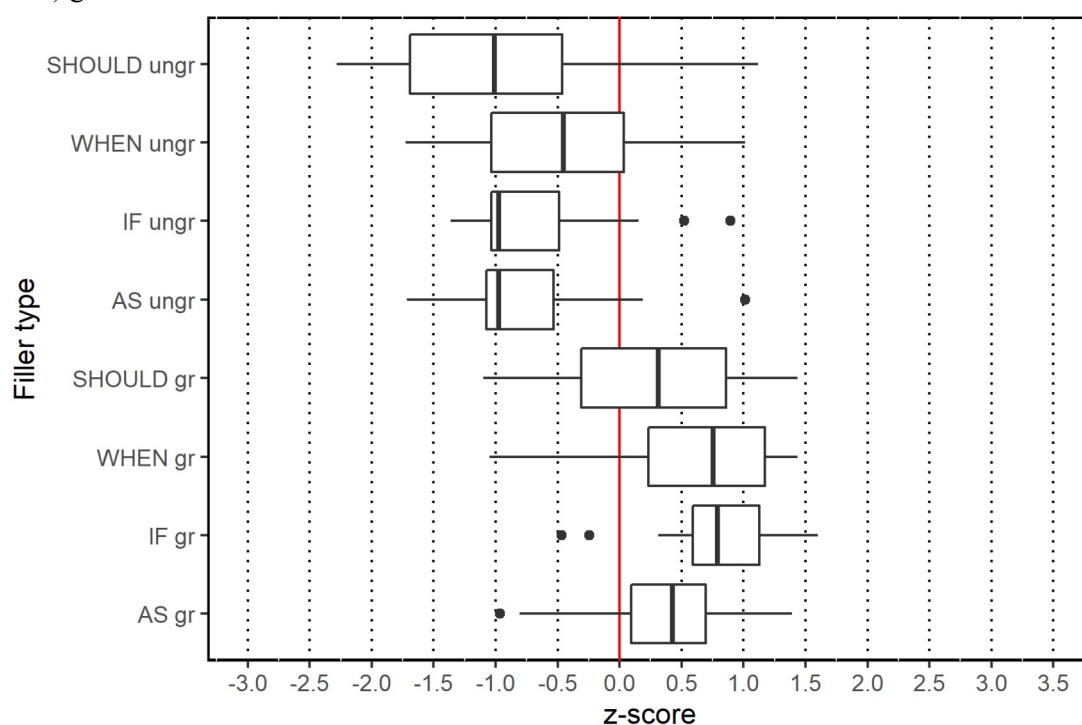


Figure 5.52 Z-scores of fillers (object pronoun extraction experiment), WSAfE ($n=15$)

However, to keep the results comparable, filler SHOULD grammatical was also dropped from the WSAfE data. The ungrammatical fillers were rated relatively consistently (minimum z-score median (SHOULD ungrammatical): -1.012 , maximum z-score median (WHEN ungrammatical): -0.454); the same applies to the grammatical fillers (minimum z-score median (SHOULD grammatical): 0.311 , maximum z-score median (IF grammatical): 0.790). The small interquartile range boxes also indicate little variance in rating by the individual participants. After dropping filler SHOULD grammatical (see above), the grammatical filler mean increased from 0.488 to 0.579 , with a SD of 0.654 and a SE of 0.098 ; the ungrammatical filler mean was -0.683 , with a SD of 0.751 and a SE of 0.970 . Thus, the

26 One participant aged 40, the remaining between 18-23.

27 One participant aged 30, the remaining between 20-27.

difference between ungrammatical and grammatical filler mean was 1.263, slightly less than in the AmE data set (1.329).

Continuing with the test items, Figure 5.53 reveals striking similarities to the AmE results: Again, test items with two overt objects (OBJ–OBJ) were rated best – in fact, clearly better than by the AmE speakers (see section 5.3.1 above), with a z-score mean of 0.749 (SD: 0.674, SE: 0.174), lending further support to Hawkins’ Minimize Domains/ Minimize Forms principle (2014). Next was ATB extraction (\emptyset – \emptyset), with a z-score mean of 0.700 (SD: 0.821, SE: 0.212). A notable difference to the AmE data is that in the WSAfE data, both of these symmetric structures were rated better than the grammatical fillers. Of the remaining combinations, the retained object pronoun in C2 (\emptyset –OBJ) was rated better (z-score mean: 0.264; SD: 1.12, SE: 0.290) than the alternative, i.e., with a retained object pronoun in C1 (OBJ– \emptyset) (z-score mean: 0.119; SD: 0.992, SE: 0.256). Note that the standard errors of the test items, indicated by the error bars in the plot, are higher than in the AmE data set due to the lower number ($n=15$) of WSAfE participants.

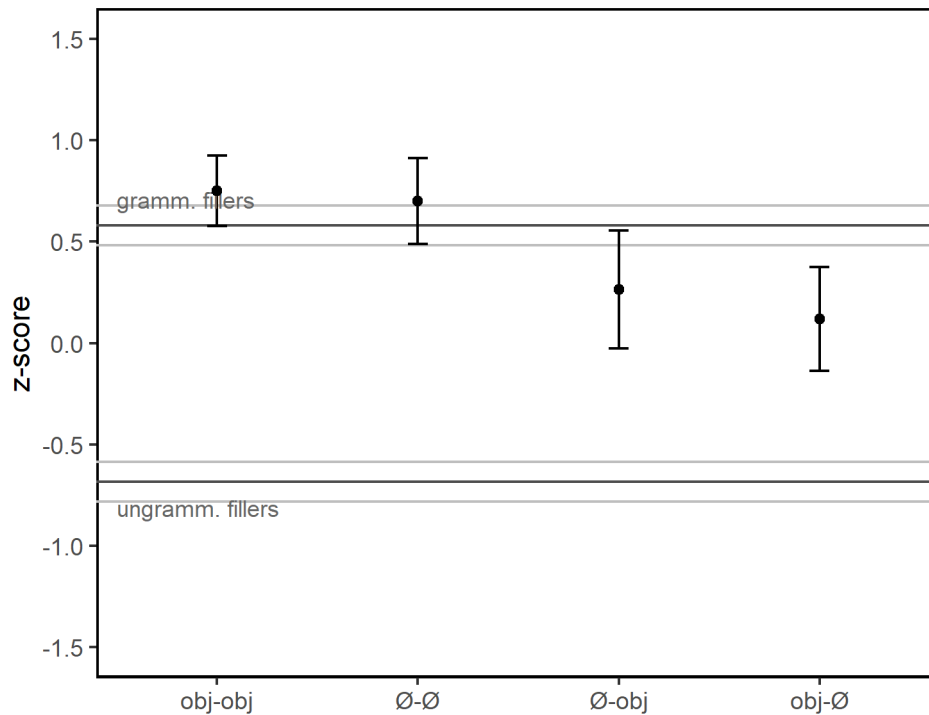


Figure 5.53 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), WSAfE ($n=15$)

The results thus confirm the findings discussed in the context of the AmE data (section 5.3.1): First, none of the test items was rated anywhere close to the ungrammatical filler mean, indicating that none of the object pronoun extraction combinations was judged as ungrammatical by the participants. This contradicts den Dikken’s ‘parasitic gap’ theory (2005), according to which extraction from C1 (which proponents of a hypotactic analysis claim to be an adjunct clause) should be ungrammatical. Again, it was this test item (\emptyset –OBJ) that was actually rated *better* than extraction from the putative main clause C2 (OBJ– \emptyset), from

which extraction should be rated better (see discussion in section 3.1.3). Furthermore, the symmetric options (OBJ–OBJ and \emptyset – \emptyset) were rated considerably better than their asymmetric alternatives (\emptyset –OBJ and OBJ– \emptyset). Again, this is compelling evidence in favor of a paratactic analysis of the English CC.

5.3.2.2 Object pronoun extraction in Coloured South African English

Figure 5.54 shows how the fillers were rated by the participants that were CSAfE speakers. The interquartile range boxes are larger than in the AmE and WSAfE data, indicating more variance in ratings. Also, the difference in rating between ungrammatical and grammatical fillers was less pronounced, with ungrammatical fillers ranging from a minimum z-score median (SHOULD ungrammatical) of -0.867 to a maximum z-score median (WHEN ungrammatical) of -0.133 . The grammatical fillers were rated from a minimum z-score median (SHOULD grammatical) of -0.059 to a maximum z-score median (WHEN grammatical) of 0.707 .

Again, filler SHOULD grammatical deviated considerably from the other grammatical fillers, with a negative z-score median (see above). As in the other data sets, however, this filler was excluded from further analysis (see section 5.3.1). After doing so, the grammatical filler mean increased from 0.362 to 0.484 , with a SD of 0.868 and a SE of 0.0069 ; the ungrammatical filler mean was -0.441 , with a SD of 0.922 and a SE of 0.063 . Thus, there was a smaller difference between the grammatical and ungrammatical filler mean (0.925) than in the AmE and WSAfE data (1.329 and 1.263 , respectively) as well as in the second experiment, where it amounted to 1.139 (cf. section 5.2.2.2).

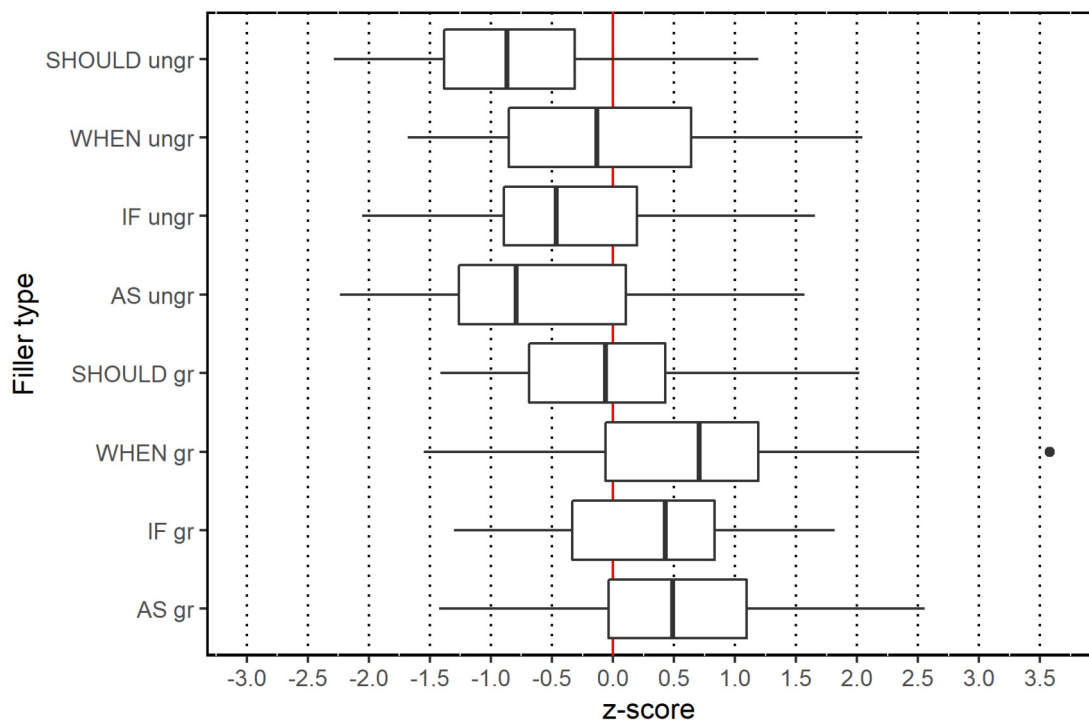


Figure 5.54 Z-scores of fillers (object pronoun extraction experiment), CSAfE ($n=53$)

Moving on to the test items, Figure 5.55 presents a picture that closely resembles the results from the other two varieties discussed so far, AmE and WSAfE. As will become apparent later, this is, in fact, a pattern found almost universally across all investigated varieties (with the exception of BSAfE, see section 5.3.2.3 below). Again, the symmetric patterns (OBJ–OBJ and \emptyset – \emptyset) were rated better than the alternatives, with the combination with both objects retained (z-score mean: 0.390; SD: 0.668, SE: 0.092) being rated slightly better than ATB extraction (z-score mean: 0.334; SD: 0.963, SE: 0.132). This is further evidence in support of a paratactic analysis of English CCs. The fact that the retention of both object pronouns was the most preferred option also lends further evidence to Hawkins' Minimize Domains/Minimize Forms principle (2014).

Similarly to the AmE data, none of the test items were rated better than the grammatical filler mean (z-score: 0.484) in CSAfE. Note, though, that the worst rated combination OBJ– \emptyset , that is, extraction from C2, was rated considerably worse than in the L1 varieties AmE (z-score mean: -0.008) and WSAfE (z-score mean: 0.119), with a negative z-score mean of -0.157 (SD: 0.968, SE: 0.133), and thus closer to the ungrammatical filler mean (z-score: -0.441) than the grammatical filler mean. That is, it is contestable whether in CSAfE, this form of extraction can be considered to be grammatical. Of course, this result has serious implications for hypotactic analyses that maintain that extraction from the main clause (i.e., C2) should be preferred over extraction from C1 (as discussed in the previous sections). In fact, the latter option (\emptyset –OBJ) was clearly preferred, with a z-score of 0.192 (SD: 0.831, SE: 0.114), even though this combination should be clearly dispreferred under the 'parasitic gap' hypothesis.

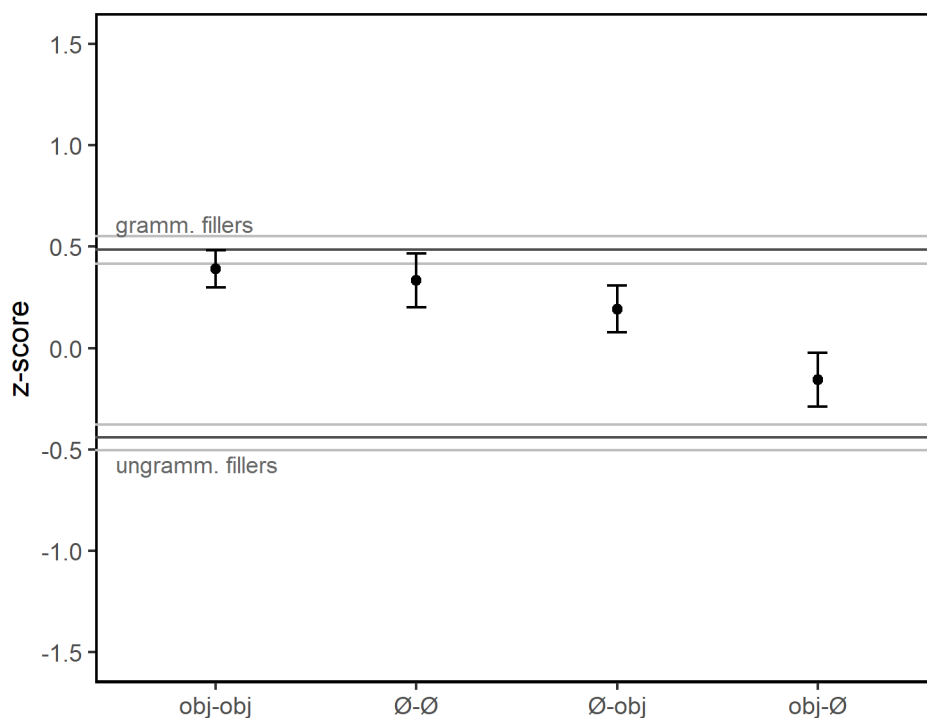


Figure 5.55 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), CSAfE (n=53)

On a final note, while the symmetric test items OBJ–OBJ and \emptyset – \emptyset were rated best within the CSAfE data set, in comparison with the other varieties, they received low ratings. While in CSAfE, both had z-score means of below 0.4, in AmE they received z-score means of over 0.5 and in WSAfE, over 0.7. However, it must be kept in mind when assessing the test items that the differences between them are less pronounced in general, as is the difference between the ungrammatical and grammatical filler means.

5.3.2.3 Object pronoun extraction in Black South African English

Figure 5.56 shows the z-scores of the individual fillers in the BSAfE data. Overall, the plot bears many resemblances to the CSAfE results: Again, the difference in rating between ungrammatical and grammatical fillers was not as clear, with ungrammatical fillers ranging from a minimum z-score median of -0.934 (SHOULD ungrammatical) to -0.168 (WHEN ungrammatical) and the grammatical fillers, excluding SHOULD grammatical, ranging from 0.238 (IF grammatical) to 0.728 (AS grammatical). Also note that some of the interquartile range boxes are considerably larger compared to the L1 varieties AmE (cf. section 5.3.1) and WSAfE (cf. section 5.3.2.1), indicating more variance in rating. Thus, the difference between ungrammatical and grammatical filler means was considerably less pronounced than in the L1 varieties, following a pattern that already emerged in the first two experiments: After dropping filler SHOULD grammatical (cf. discussion in section 5.3.1), the grammatical filler mean in the BSAfE data set increased from 0.339 to 0.427 , with a SD of 0.771 and a SE of 0.076 ; the ungrammatical filler was -0.434 , with a SD of 0.907 and a SE of 0.078 . Thus the difference amounted to just 0.862 (AmE: 1.329 ; WSAfE: 1.263). Again, it is likely that this is due to variety-specific effects that were not considered before creating the ungrammatical filler items, which featured erroneous subject-verb agreement (see discussions in sections 5.1.2.3 and 5.2.2.3). This must be borne in mind when evaluating the results below.

Next, Figure 5.57 shows how the test items were rated. The plot reveals a familiar pattern that will also emerge from the remaining two varieties (cf. sections 5.3.3 (SingE) and 5.3.4 (KenE) below): The symmetric combinations were clearly preferred over the asymmetric ones. While the test items in which both object pronouns were retained (OBJ–OBJ) were rated just slightly better (z-score mean: 0.451 ; SD: 0.752 , SE: 0.129) than the grammatical filler mean (0.427), ATB extraction (\emptyset – \emptyset) was rated the best in BSAfE (z-score mean: 0.673 ; SD: 0.845 , SE: 0.145). This is a notable difference to the other varieties, which all followed the same pattern. Of the remaining alternatives, again, extraction from C1 (\emptyset –OBJ) was rated better (z-score mean: 0.228 ; SD: 0.836 , SE: 0.143) than extraction from C2 (OBJ– \emptyset), which in fact was rated close (z-score mean: -0.225 ; SD: 0.728 , SE: 0.125) to the ungrammatical filler mean (-0.434). Regarding the hypotheses outlined in section 5.3, these results conform to the findings discussed in the context of the results of the other varieties: Again, there is a clear indication that symmetric structures (\emptyset – \emptyset and OBJ–OBJ) are clearly preferred over their asymmetric alternatives (\emptyset –OBJ and OBJ– \emptyset). However, the fact that ATB extraction is preferred over the retention of both object pronouns contradicts Hawkins' Minimize Domains/Minimize Forms principle (2014). Furthermore, extraction from C1 is clearly preferred over extraction from C2, which in BSAfE was actually rated close to the ungrammatical filler mean (although recall that the degree of 'ungrammaticality' of the ungrammatical fillers in BSAfE might be skewed). Again, this has serious implications for the 'parasitic gap' theory

(see discussions in sections 5.3.1 and 5.3.2.1 above) and thus, a hypotactic analysis of the English CC construction.

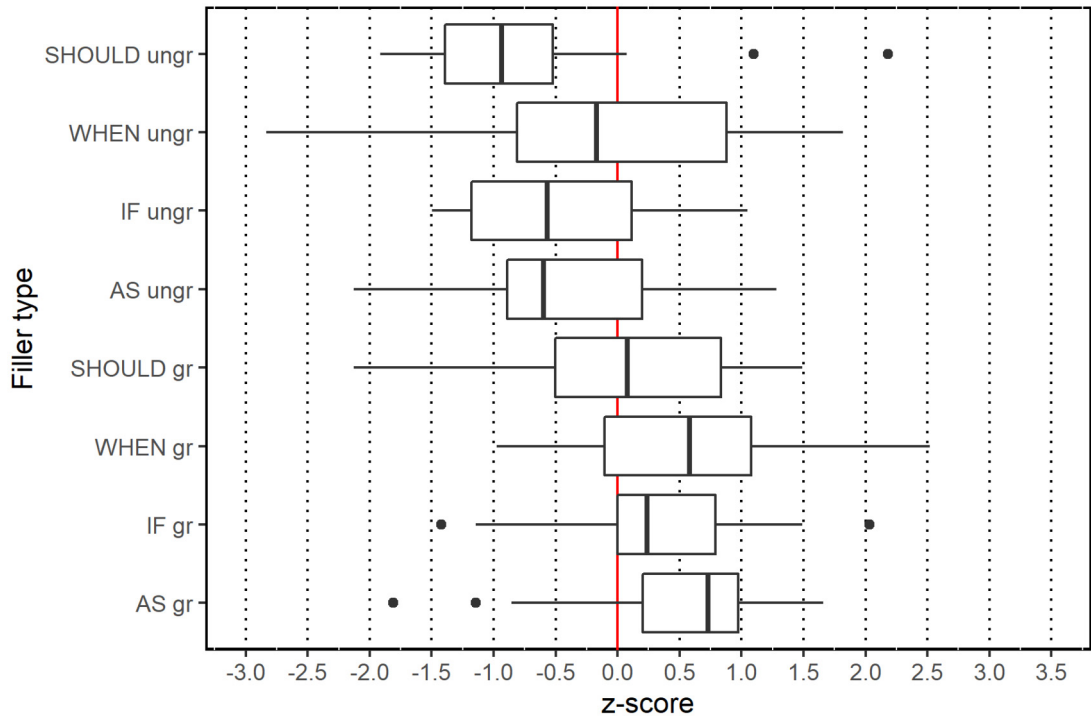


Figure 5.56 Z-scores of fillers (object pronoun extraction experiment), BSAfE (n=34)

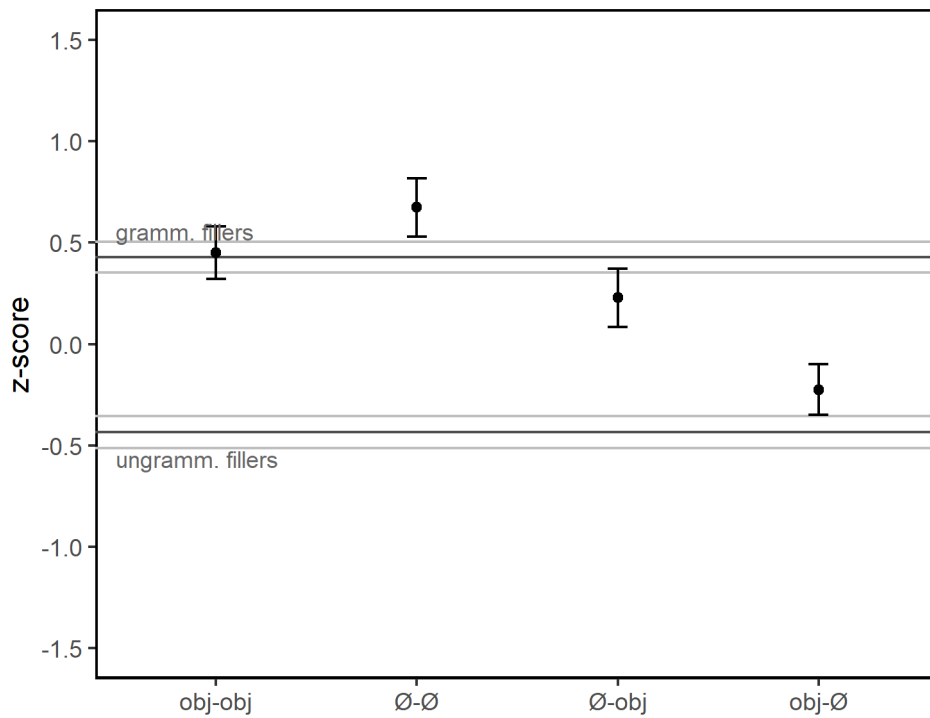


Figure 5.57 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), BSAfE (n=34)

5.3.3 Object pronoun extraction in Singapore English

The pen-and-paper experiments in Singapore were carried out along with the other two experiments on 29 and 30 October 2019. The modalities of the object pronoun extraction experiment were therefore the same. In total, 33 participants could be recruited for the third experiment (19 female, 14 male, age 18-24).

Figure 5.58 shows how the individual fillers were rated in the SingE data set. At a first glance, the plot already shows that of all the varieties, the difference between ungrammatical and grammatical fillers was the least pronounced in SingE. This is confirmed by the z-score medians; with ungrammatical fillers ranging from a minimum z-score median of -0.559 (SHOULD, IF, and WHEN ungrammatical) to -0.392 (AS ungrammatical) and the grammatical fillers, excluding SHOULD grammatical, ranging from 0.483 (WHEN grammatical) to 0.840 (AS grammatical). After dropping SHOULD grammatical from the data set (see discussion in section 5.3.1 above), the grammatical filler mean increased slightly from 0.283 to 0.376 , with a SD of 0.836 and a SE of 0.084 . The ungrammatical filler mean was -0.346 , with a SD of 0.848 and a SE of 0.074 . The difference between the ungrammatical and grammatical filler mean was thus only 0.722 , the lowest of all varieties. As discussed at length above (see section 5.1.3), one possible reason for this is the general lack of inflection of verbs in SingE, resulting in the Singaporean participants being less sensitive to the presence and absence of 3rd Ps. sg. -s in the filler items. Again, it must be pointed out that the following analysis of the test items is therefore not fully comparable to the varieties in which the distinction between grammatical and ungrammatical fillers was clearer (AmE: 1.329 , WSAfE: 1.263 , CSAfE: 0.925).

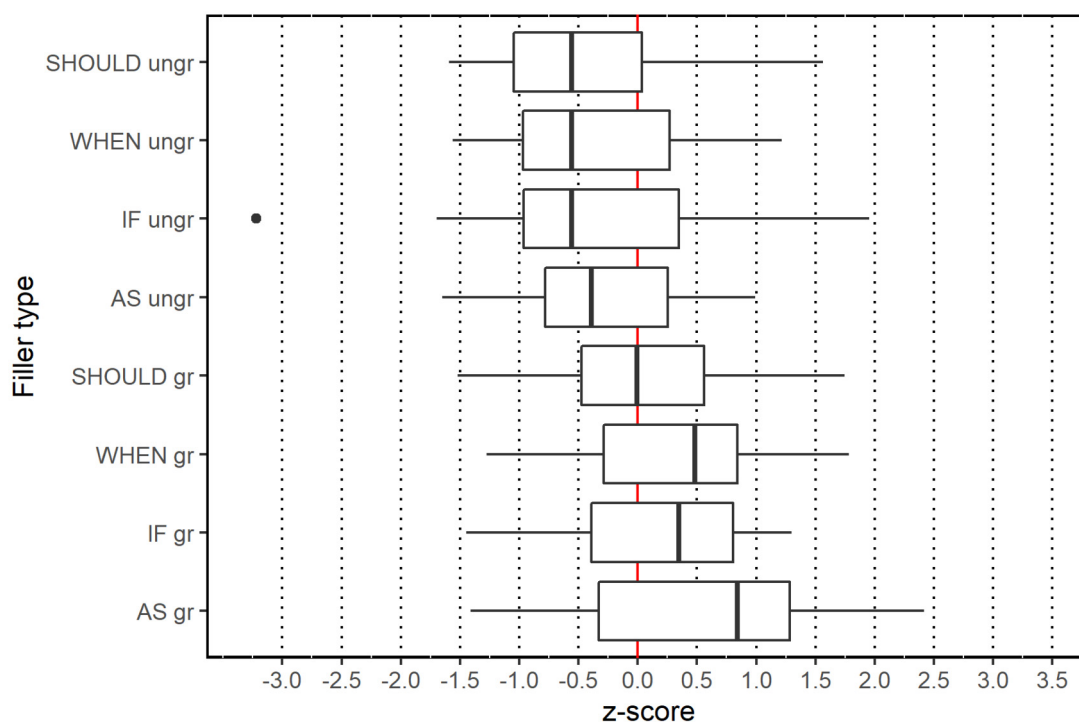


Figure 5.58 Z-scores of fillers (object pronoun extraction experiment), SingE ($n=33$)

Moving on to the test items, Figure 5.59 shows how each combination was rated by the Singaporean participants. The order of rating was the same as in the other varieties (with the exception of BSAfE, see section 5.3.2.3 above), reflecting the fact that stepwise regression did not reveal the fixed effect VARIETY to be significant. The test items in which both object pronouns were retained (OBJ–OBJ) were rated best, with a z-score mean of 0.583 (SD: 0.871, SE: 0.152). ATB extraction, i.e., object pronoun extraction in both C1 and C2 (\emptyset – \emptyset), was rated only slightly worse (z-score mean: 0.555; SD: 1.11, SE: 0.194), followed by extraction from C1 (\emptyset –OBJ) with a z-score mean of 0.357 (SD: 0.798, SE: 0.129) and finally, extraction from C2 (OBJ– \emptyset), with a z-score mean of 0.306 (SD: 0.810, SE: 0.141).

Thus, as in the other varieties, the symmetric combinations were rated better than the asymmetric ones, although the difference was less pronounced. In fact, all combinations were rated close to the grammatical filler means, although note that the symmetric combinations were rated better than the filler means, while the asymmetric combinations were rated worse. The implications for the hypotheses discussed in section 5.3 are therefore the same as in the other varieties: While none of the combinations were rated as ungrammatical, there is a preference for symmetric form in English CCs, supporting a paratactic analysis of the construction. Retained object pronouns in both C1 and C2 are preferred over all forms of extraction, confirming Hawkins' Minimize Domains/ Minimize Forms principle (2014). Furthermore, object pronoun extraction from C1 was rated better than from C2, which contradicts any claims about a 'parasitic gap' according to which extraction from C1 should be possible only if there is also extraction from C2.

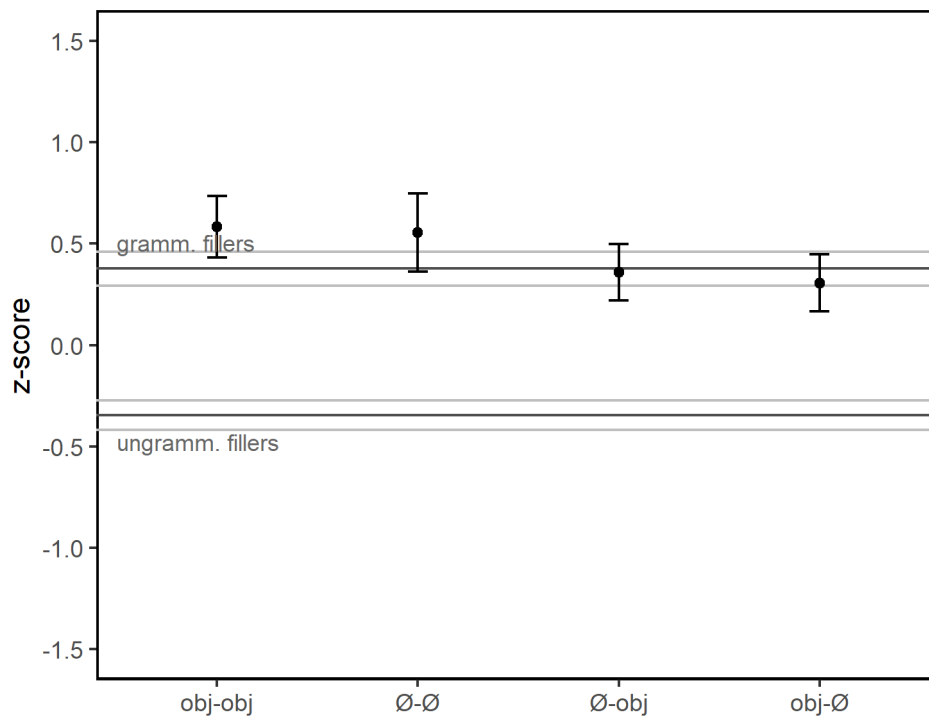


Figure 5.59 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), SingE (n=33)

5.3.4 Object pronoun extraction in Kenyan English

As was the case with the other varieties, the object pronoun extraction experiment in Kenya was conducted together with the other experiments, so that the conditions were comparable. In total, 40 participants could be recruited at the University of Nairobi (19 female, 21 male, age 20-30²⁸).

Figure 5.60 shows how the individual fillers were rated by the Kenyan participants. Note the long whiskers compared to e.g. the Singaporean fillers (Figure 5.58), indicating a higher variance in rating. The participants rated the ungrammatical fillers more consistently (minimum z-score median (SHOULD ungrammatical): -0.666 , maximum z-score median (WHEN ungrammatical): -0.316) than the grammatical fillers (AS grammatical): 0.132 , maximum z-score median (WHEN grammatical): 0.626), following a pattern already known from the other varieties.

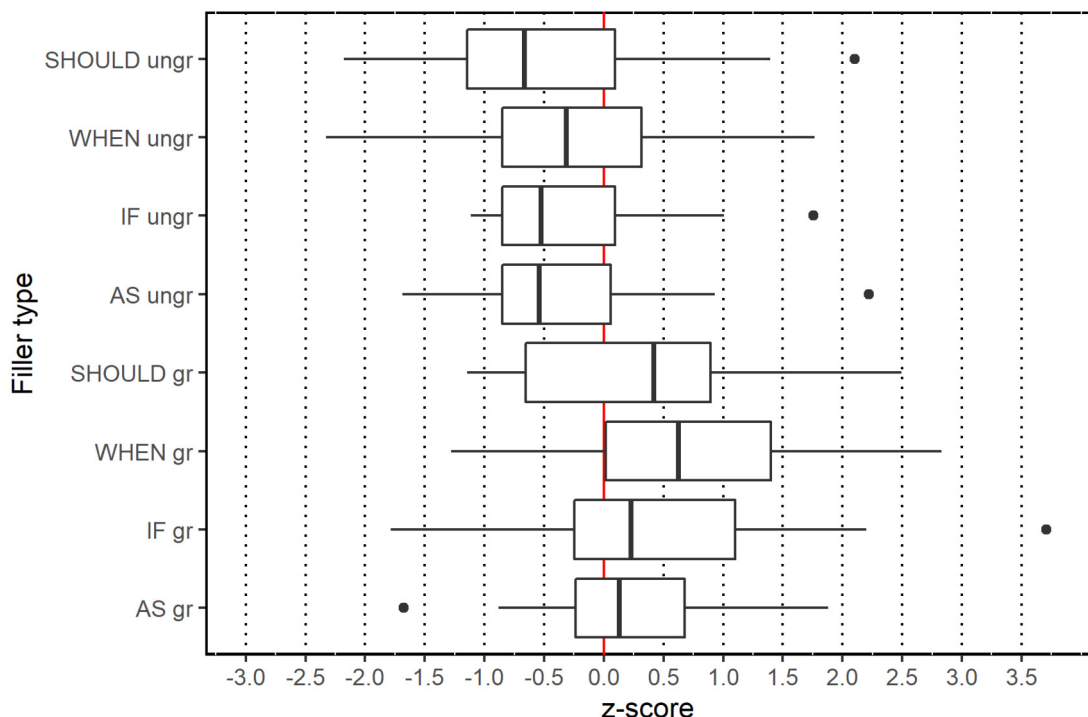


Figure 5.60 Z-scores of fillers (object pronoun extraction experiment), KenE ($n=40$)

Also note that SHOULD grammatical, the filler which was excluded on grounds of deviating too far from the other grammatical fillers in most of the other data sets (cf. discussion in section 5.3.1), was rated considerably better by the KenE participants, with a positive z-score median of 0.421 . Nevertheless, to ensure comparability between the varieties, it was removed, after which the grammatical filler mean increased only slightly from 0.376 to 0.431 , with a SD of 0.925 and a SE of 0.0844 . The ungrammatical filler mean was -0.316 , with a SD of 0.852 and a SE of 0.068 . The difference between the ungrammatical and grammatical filler means of 0.747 was thus quite small compared to the L1 varieties AmE (1.329) and WSAfE (1.263). This is comparable to the corresponding results in the

28 One participant aged 30, the remaining between 20-27.

asymmetric encoding experiment (0.780) and smaller than in the *that*-complementizer experiment (0.974). It is therefore important to note, as in sections 5.3.2.3 (BSAfE) and 3.2.4 (SingE), that the following analyses (i.e., where degrees of grammaticality are determined by relation to ungrammatical and grammatical filler means) are not fully comparable to those where the ungrammatical–grammatical filler distinction was more pronounced, e.g. in AmE and WSAfE.

Moving on to the test items, Figure 5.61 yet again reveals many similarities to the other varieties. For example, the order of rating was exactly the same (with the exception of BSAfE, cf. section 5.3.2.3): The best-rated combination was OBJ–OBJ with a z-score mean of 0.555 (SD: 0.913, SE: 0.144) that was just above the grammatical filler mean of 0.431. Next came ATB extraction (\emptyset – \emptyset), with a z-score mean of 0.299 (SD: 1.091, SE: 0.173). Thus, again the two symmetric combinations were rated better than the remaining asymmetric variants. Note, however, that the combination with extraction from C1 (\emptyset –OBJ) was rated only slightly worse, with a z-score mean of 0.252 (SD: 0.926, SE: 0.146). Similarly to CSAfE and BSAfE, the test items which featured extraction from C2 (OBJ– \emptyset) were rated closer to the ungrammatical filler mean (z-score: -0.316) than the grammatical filler mean, with a z-score of -0.003 (SD: 0.791, SE: 0.125), raising questions about its grammaticality. Note that yet again, this is actually the combination that, according to proponents of a hypotactic analysis of the PdE CC, should be rated best, since it features extraction from the alleged main clause (C2).

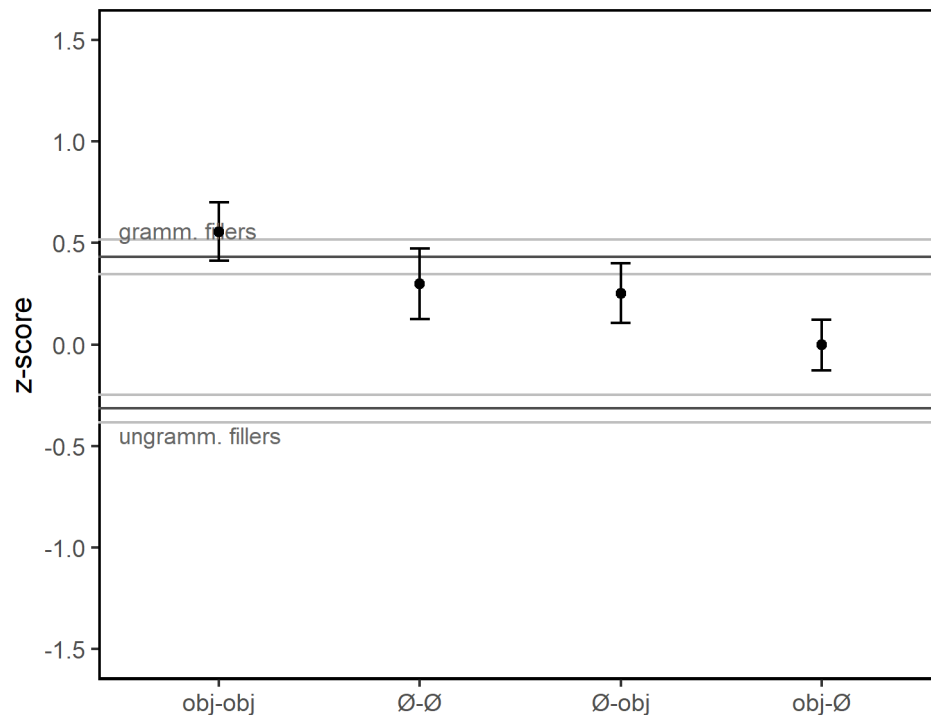


Figure 5.61 Z-scores of OBJ in C1 vs. OBJ in C2 (dark gray horizontal lines: filler means; light gray lines: standard error), KenE (n=40)

Regarding the hypotheses discussed in section 5.3, it is thus possible to confirm what has already been discussed at length in the previous sections: There is a clear preference for the

retention of both object pronouns, in line with Hawkins' Minimize Domains/ Minimize Forms principle. There is a clear preference for symmetry, underlining the paratactic nature of the PdE CC across varieties. And finally, there is no evidence for any 'parasitic gap' phenomena, with serious implications for a hypotactic analysis of the English CC.

5.3.5 Object pronoun extraction across varieties

As the linear regression demonstrated (see section 5.3), the fixed effect VARIETY did not have any significant effect on the experimental results. Neither was VARIETY part of any significant interactions, as was the case in the asymmetric encoding experiment. In other words, the experiments revealed no variety-specific (and therefore, DM stage-specific) effects regarding object pronoun extraction. Thus, an exhaustive discussion of variation across DM stages and varieties as in the context of the other two experiments (cf. sections 5.1.5 and 5.2.5) would be superfluous. Nevertheless, a plot comparing how the individual combinations were rated across varieties is provided in Figure 5.62. It reveals, with the exception of BSAfE (cf. section 5.3.2.3), a very homogeneous picture: The order in which the different combinations were rated was the same in every variety, with very similar intervals between them in many places. For example, despite different *absolute* ratings, the *relative* difference between retained object pronouns (OBJ–OBJ) and ATB extraction (\emptyset – \emptyset) is very similar across AmE (0.152), WSAfE (0.050), SingE (0.028), and CSAfE (0.056).

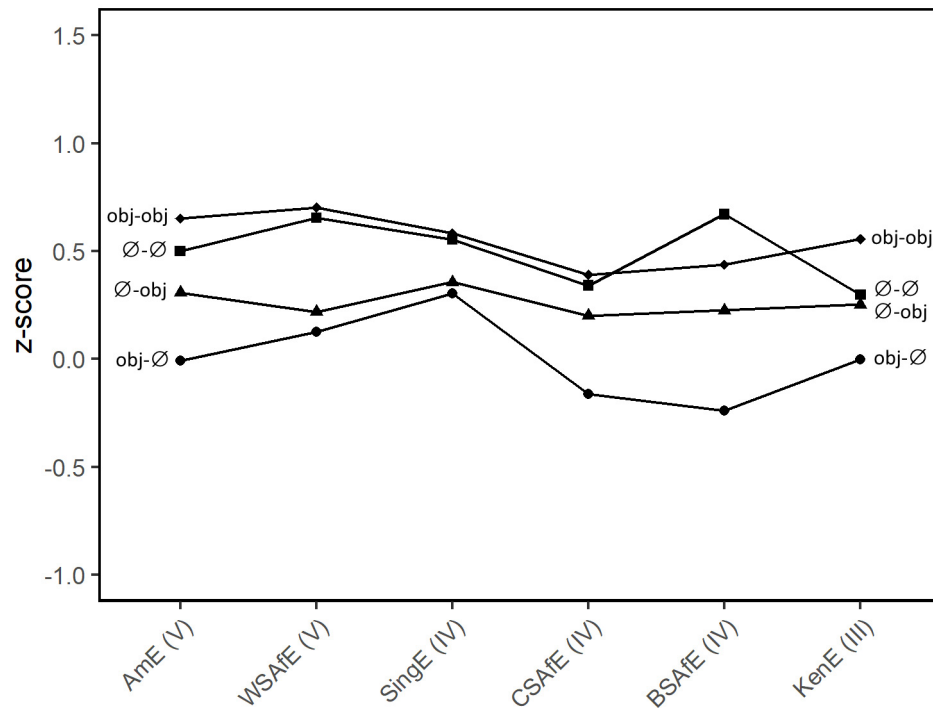


Figure 5.62 Magnitude estimation z-scores of NO OBJ-NO OBJ (\emptyset – \emptyset), OBJ-OBJ (*obj-obj*), NO OBJ-OBJ (\emptyset –*obj*) and OBJ-NO OBJ (*obj*– \emptyset) across varieties, object extraction experiment

The scatter plots in Figures 5.63 (OBJ–OBJ), 5.65 (\emptyset – \emptyset), 5.64 (\emptyset –OBJ) and Figure 5.66 (OBJ– \emptyset) confirm that there are no effects across varieties: In each of the plots, the

superimposed linear regression line is almost horizontal, indicating neither positive nor negative correlations. The fact that no variety-specific effects could be determined also means that there is no evidence to support or refute Mesthrie's 'deleters vs. preservers' hypothesis (2006, 2008a, 2012) and Kortmann's claim of an L1-L2 continuum (2014).

5.4 Summary

This chapter presented and discussed the results obtained from three different magnitude estimation experiments that were carried out in six different locations in October and November of 2019. Using advanced statistical analysis in the form of mixed models, the following observations were made:

- (i) Corroborating the results of the corpus study in chapter 4, **that-complementizers** are generally dispreferred in English: Across all varieties, those test items without *that*-complementizers were consistently rated best;
- (ii) this is also illustrated by the fact that (with the exception of AmE), the more *that*-complementizers that were in a test item – irrespective of the combination across C1 and C2 – the worse the rating was;
- (iii) nevertheless, *that*-complementizers are generally (i.e., in all possible combinations across C1 and C2) grammatical in English: None of the test items were rated as ungrammatical in any of the varieties;
- (iv) *that*-complementizers in C1 are slightly more entrenched in the stage V varieties (AmE, WSAfE); there was furthermore a trend that can be summarized as 'the higher the DM stage, the more entrenched *that*-complementizers in C1 are';
- (v) *that*-complementizers in C2 are generally dispreferred, reflecting a low degree of entrenchment, thus lending support to Hoffmann's claim that they "are analogically formed on the few C1 clauses with a *that*-complementizer" (Hoffmann 2019: 212);
- (vi) **asymmetric encoding** using *as*_{C1} and/or *then*_{C2} was clearly dispreferred across varieties although none of the combinations were rated as ungrammatical;
- (vii) however, lower-stage varieties were less sensitive to the use of *as*_{C1} and/or *then*_{C2}: the lower the DM stage, the less pronounced the difference in rating between the prototypical CC and the remaining variants was (in particular, *as-then*) and conversely, the higher the DM stage, the more pronounced the preference for test items without *then*_{C2} and thus, the prototypical CC form was
- (viii) all forms of **object pronoun extraction** were rated as acceptable across varieties (with the caveat that in CSAfE and BSAfE, extraction from C2 was rated closer to the ungrammatical filler mean than the grammatical filler mean);
- (ix) however, there was a clear preference for object pronoun retention in C1 and C2;
- (x) ATB extraction was rated second-best across varieties (with the exception of BSAfE), underscoring the preference for symmetric encoding;
- (xi) there were no variety-specific effects for object pronoun extraction, that is, all varieties behaved more or less the same in this regard;
- (xii) and, finally, the results of all three experiments can be summarized as 'the closer to the prototypical CC form, the better the rating', where 'standard CC form' refers to CCs without *that*-complementizers, without clause-initial *as*_{C1} and *then*_{C2}, and with both object pronouns retained when embedded.

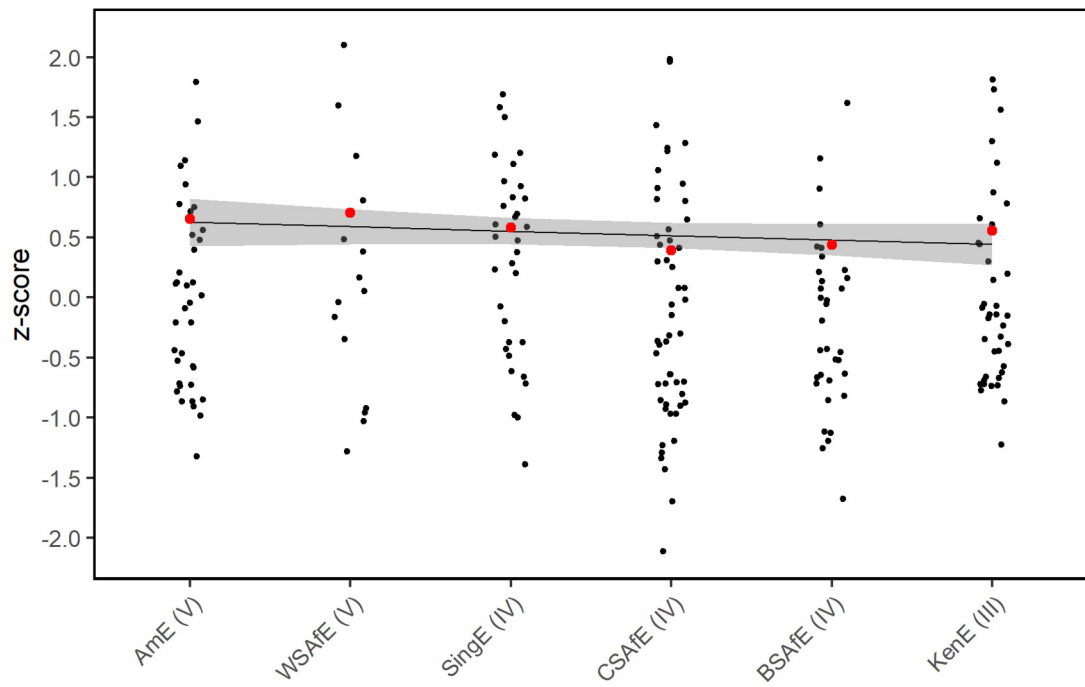


Figure 5.63 Scatter plot of OBJ-OBJ z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

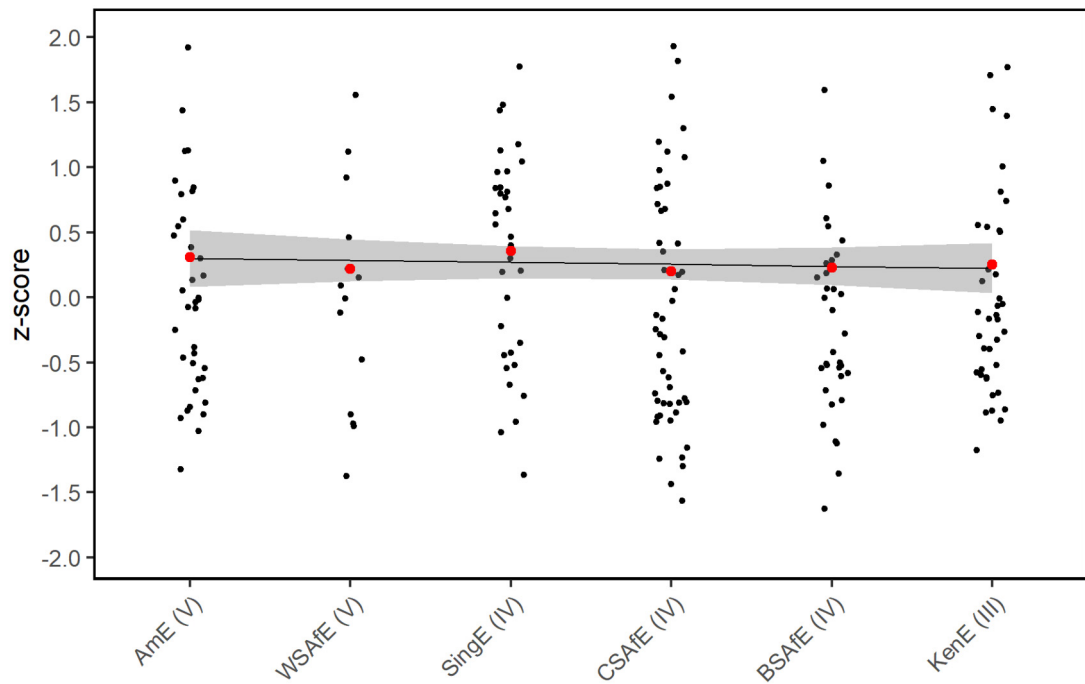


Figure 5.64 Scatter plot of NO OBJ-OBJ (\emptyset -OBJ) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

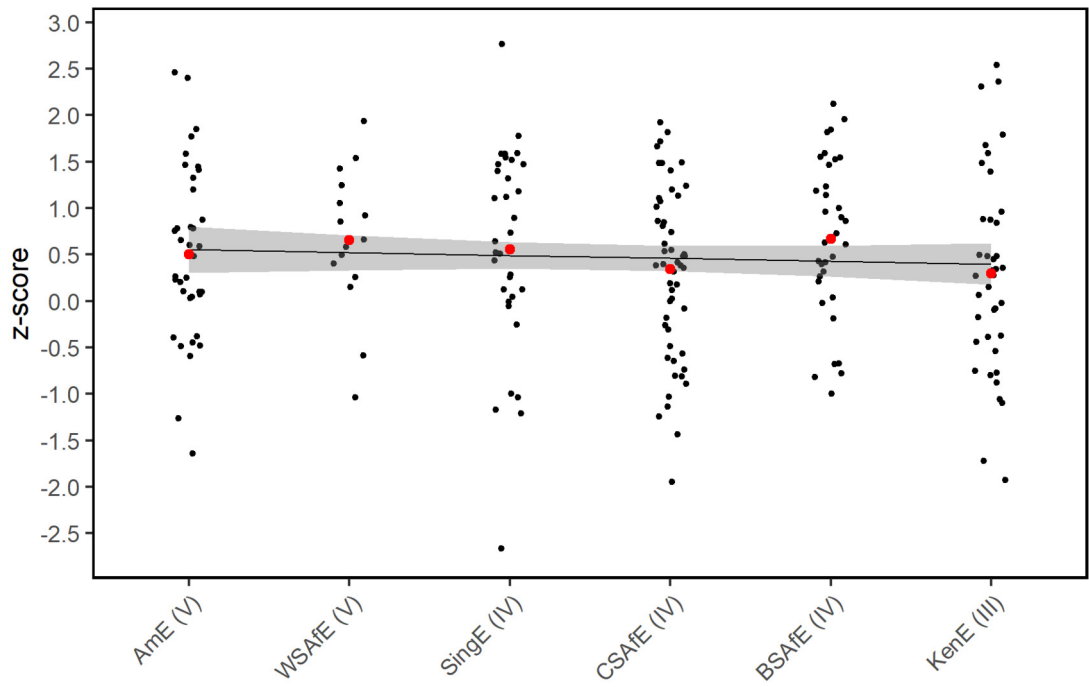


Figure 5.65 Scatter plot of NO OBJ-NO OBJ ($\emptyset-\emptyset$) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

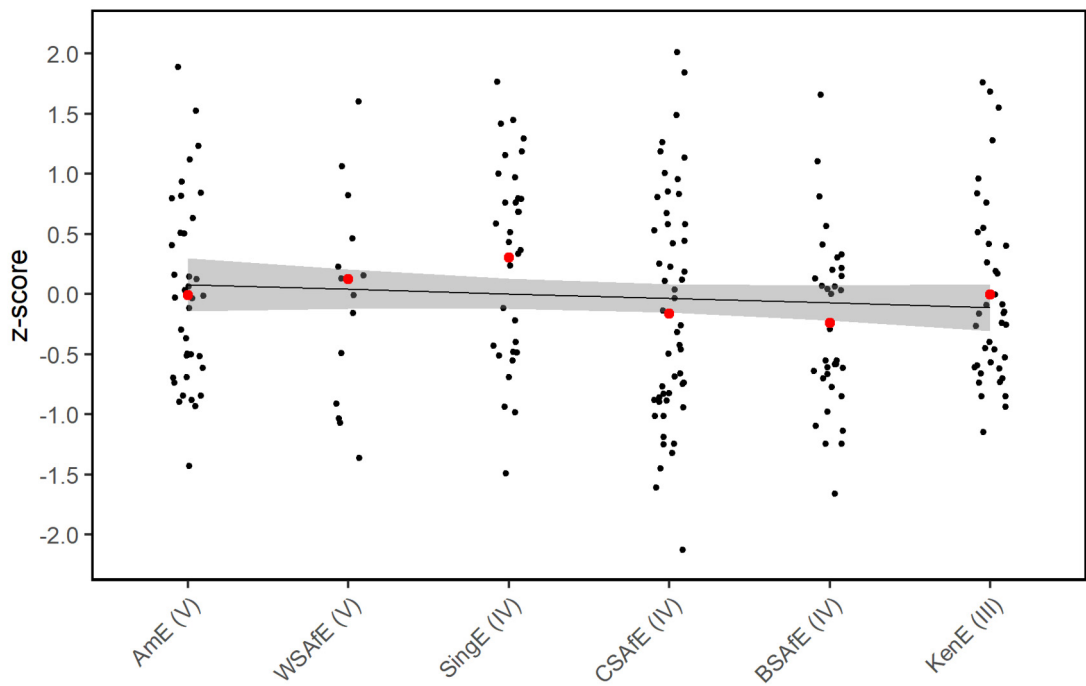


Figure 5.66 Scatter plot of OBJ-NO OBJ (OBJ- \emptyset) z-score ratings across varieties with superimposed linear regression line; red dots indicate variety means

A final note concerns the methodology. It must be noted that in future studies, ungrammatical filler items have to be created using violations other than erroneous subject-verb agreement (i.e., omission of 3rd Ps. Sg. -s), since speakers of some L2 varieties (in the case of this study, BSAfE, SingE, and KenE) appeared to be less sensitive to these errors, thereby skewing results and ultimately, the ‘yardstick’ against which test items results were compared. However, also note that there was a relatively stable intra-variety rating of ungrammatical and grammatical fillers across experiments. This demonstrated that the method of interpreting experimental test results in relation to grammatical and ungrammatical fillers is a very reliable method, provided that grammatical violations are more comparable across varieties (see above). Table 5.11 summarizes the differences in z-score means between ungrammatical and grammatical fillers across experiments and varieties, showing that there was remarkably little variance *within* varieties.

Table 5.11 Differences in z-score means between ungrammatical and grammatical fillers across experiments and varieties

	<i>That-complementizers</i>	<i>Asymmetric encoding</i>	<i>Object pronoun extraction</i>
AmE	1.366	1.316	1.329
WSAfE	1.277	1.422	1.263
CSAfE	1.084	1.139	0.925
BSAfE	0.931	0.891	0.862
SingE	0.864	1.162	0.722
KenE	0.974	0.780	0.741

Now, with ample empirical evidence from a large-scale corpus study that analyzed over 10,000 tokens and three psycholinguistic experiments totaling more than 600 participants, it is time for a comprehensive description of the English CC mental network. In the next chapter, it will be demonstrated that the most efficient analysis of the English CC and its many ‘idiosyncrasies’, especially the variety-specific ones, is carried out within a Construction Grammar framework.

6 A Usage-based Construction Grammar account of the English Comparative Correlative construction

It's possible that the language faculty is just 'ugly', 'inelegant', 'profligate', 'unnatural', and massively redundant. If so, the minimalist project will fail. (Hornstein et al. 2005: 7)

Usage-based models of language learning unavoidably suggest a language network that is rather baroque, involving massive redundancy and vastly rich detail [...].

(Traugott and Trousdale 2013: 53)

As discussed in chapter 1, linguistic research is driven by the desire to explain the potential of human language to produce an infinite amount of sentences with a finite set of rules. Two theories with fundamentally different approaches to answering this question were presented, and it was claimed that the non-modular, phrasal approach known as 'Construction Grammar' (CxG) is able to accommodate the Comparative Correlative (CC) construction, an interesting 'puzzle piece' of the 'world map' of the English language. In this chapter it will be argued that the phrasal approach, and in particular, Usage-based CxG, has several key advantages over Mainstream Generative Grammar (MGG) when it comes to accounting for the evidence from the corpus study (chapter 4) and the psycholinguistic experiments (chapter 5). MGG-based studies have had to rely on *exclusive* concepts such as 'the periphery' (as opposed to 'the core'), 'non-standard' structures, and 'special constructions' to accommodate the various so-called "quirks" (den Dikken 2005: 497), or 'idiosyncrasies' that are characteristic of the CC construction. The use of such terminology, however, suggests that a theory is unable to fully account for the entire language system.

In this chapter, it will be argued that the linguistic phenomena investigated in this study are better described as construction-specific features, not idiosyncrasies, and that CxG is able to quite effortlessly accommodate them using an *inclusive* approach. First and foremost, this approach is based on the concept of a "language network" (Traugott and Trousdale 2013: 53), which will make it possible to answer the most fundamental question that constructional approaches strive to answer: "[W]hat constitutes speakers' linguistic knowledge that corresponds to language use with native-like fluency" (Fried 2017: 243). As this chapter will show, the result is anything but "ugly, inelegant, profligate" or "unnatural" (Hornstein et al. 2005: 7) but rather, a fascinating snapshot of human language that turns out to be truly "baroque" (Traugott and Trousdale 2013: 53). Furthermore, it will be shown that domain-general processes can account for shared formal features across varieties, and how differences between varieties can be explained with specific input situations. Finally, "bring[ing] intricate, quantitative modelling of usage data to bear on theoretical modelling" (Hundt 2021: 298) the compatibility of Schneider's Dynamic Model (2003, 2007) with constructionist approaches will be illustrated.

Accordingly, the findings from chapters 4 and 5 will be brought together in the present chapter, and show how the various features of the English CC construction investigated in this study are analyzed using a Usage-based CxG approach. First, section 6.1 will review the problems that MGG-based approaches and reductionist analyses have struggled with when analyzing the Comparative Correlative construction. Next, section 6.2 will discuss the Usage-based CxG approach to analyzing language, and how it can be applied to the CC construction.

It will be shown how evidence for the existence of constructions can be derived from corpus data and experimental results. Section 6.3 will then provide a comprehensive analysis of the results from chapters 4 and 5, providing a detailed ‘map’ of the constructional network that is at work behind the CC construction. Finally, section 6.4 will take into account variety-specific effects, demonstrating that Usage-based CxG is also able to accommodate variation across World Englishes and demonstrating that the theory is compatible with Schneider’s Dynamic Model (DM) of the evolution of World Englishes, confirming its predictive power.

Confirming the main hypotheses outlined in section 1.5, it will thus be demonstrated that (1) the best way to describe the English CC construction is by means of a meso-constructional network; (2) general trends across varieties can be accounted for with domain-general cognitive principles and (3) variety-specific effects can be explained with particular input situations; (4) there is evidence in the corpus data and results of the psycholinguistic experiments that confirms the predictive power of the Dynamic Model (Schneider 2003, 2007); and finally, (5) the evidence from the corpus data and psycholinguistic experiments confirms Kortmann’s hypothesis of an L1-L2 continuum in World Englishes (2014).

6.1 Idiosyncrasies or construction-specific features?

In chapters 4 and 5, twelve linguistic variables were thoroughly scrutinized, producing a wealth of empirical evidence that, above all, illustrates the shortcomings of previous attempts at analyzing the English CC construction. Perhaps most striking is the finding that all of these reductionist approaches – be it A-bar or WH-movement (Chomsky 1981, 1995, 2000, 2001), maximally schematic constructional templates such as Culicover and Jackendoff’s (1999), Borsley’s HPSG analysis (2004), or Sag’s two constraints (2010) – treat C1 and C2 as independent constituents, presupposing that the two subclauses are realized independently from each other. However, the evidence presented in chapters 4 and 5, corroborating previous findings from smaller corpus studies (Hoffmann et al. 2019, 2020), highlighted an aspect that reductionist analyses have completely overlooked: The corpus study and the psycholinguistic experiments demonstrated that C1 and C2 are all but independent from each other. To quote Hoffmann et al., “English CCs exhibit a great number of associations across granddaughter nodes in C1 and C2 that cannot be modelled by a single constructional template” (2019: 24). Although speakers are completely free to choose how they formally realize C1 and C2 (as became evident from the high number of hapaxes among lexical fillers, cf. section 4.3), the way they realize the two subclauses is anything but random. Rather, the results discussed in chapters 4 and 5 have clearly shown that formally, C1 and C2 are interdependent to a high degree. This finding applies to all slots of the CC construction and thus, along the entire lexicon-syntax continuum (cf. section 1.2): From lexical fillers to object pronoun extraction to deletion/truncation patterns, the various statistical analyses carried out on corpus and experimental data have consistently demonstrated that across all investigated varieties of English, there are significant association effects between C1 and C2.

For the linguist-cartographer, to revisit the metaphor from chapter 1, such findings mean that the introspective approaches hitherto applied are not satisfactory, because they fail to account for important aspects of the CC construction. That is not to say that the insights from these previous studies are altogether erroneous. However, as will be argued in this chapter, under a Usage-based Construction Grammar (CxG) approach it is possible to provide a

considerably more detailed and inclusive account of the CC, including the cross-clausal association phenomena discussed earlier. With a Usage-based CxG approach, as will be shown, it is easy to accommodate precisely those aspects of the CC construction that under other approaches have caused so much headache, leading to cumbersome analyses. Consider, for example, the following statements from the literature (all emphasis JH):

- “various traditional syntactic phenomena *fall outside of the scope of syntax proper*” (Borsley 2003: 16, referring to Chomsky 1995)
- “[t]he comparative correlative (CC) [...] is a notable *peripheral construction*” (Borsley 2003: 16)
- “[t]he two clauses in the [CC] construction can be analysed as *non-standard head-filler phrases* [...]. The construction as a whole can be analyzed as a *non-standard head-adjunct phrase*” (2004: 71)
- “Spec, DegP of the HEADCL is filled by a QP *whose head is null and whose specifier is a null demonstrative*” (den Dikken 2005: 520)
- “a *fourth sentential recursive device* must be recognized” (Knowles 1978: 221)
- “[CCs] require *special constructions*” (Abeillé et al. 2006: 7)
- “the symmetric CC in Spanish [...] is a *non standard type* of coordinate construction, and the asymmetric CC [...] is a *non standard type* of subordinate construction” (Abeillé et al. 2006: 18)

What these statements have in common is their rather awkward approach to the CC construction. By virtue of its ‘idiosyncrasies’, it has been relegated to the periphery of grammar or even excluded from ‘the scope of syntax proper’ (Borsley 2003, 2004); so-called ‘null operators’ have been posited to account for missing material ‘on the surface’ (den Dikken 2005) and there has been speculation about a fourth recursive device (Knowles 1978) and special constructions (Abeillé et al. 2006). In fact, it is striking how frequently terms such as ‘non-standard’, ‘exception’, ‘periphery’, and ‘special’ are encountered in MGG-based analyses of the CC construction. The use of such terminology, however, implies that it is a theoretical framework with serious issues when it comes to accommodating constructions beyond the ‘core’, such as the CC. This is by no means a trivial matter; Fillmore et al., for example, have noted that the “repository of what is idiomatic in the language [...] is very large” (1988: 504) and Culicover and Jackendoff’s remark that “the ‘periphery’ cannot be neglected” (1999: 570) is therefore most appropriate.

However, what does it say about a theory if it is unable to account for idiomatic and moreover, highly productive constructions such as the CC without positing exceptions here and ‘special constructions’ there, without relegating it to the ‘periphery’ or claiming it to ‘fall outside the scope of syntax proper’? Put differently, if a theoretical framework is only capable of efficiently accounting for the so-called ‘core’ of grammar, can it really be regarded as satisfactory? And what happens when a competing theory offers a considerably more efficient account of a construction? Consider the following quote that echoes Occam’s razor:

The descriptive apparatus of one linguistic theory might well be more adaptable than that of a competitor for the purposes of explaining why learners encode peripheral constructions as they do. And if other things were equal, that would be the better theory; explanatory success in this sense could give one linguistic theory an edge over another. (Fodor 2001: 376)

Substituting ‘learners’ with ‘speakers’ Fodor’s quote above, one ends up with a statement that perfectly captures the essence the main theme of the present study: the competition between MGG and (Usage-based) CxG. Recall the first research question (see section 1.5): How can the abstract representation of the Comparative Correlative construction across English varieties be *best* described? Accordingly, the main goal of the present investigation is to demonstrate that when it comes to accommodating the CC construction, CxG clearly has an edge over MGG by virtue of its ability to effortlessly account for ‘peripheral’ constructions: As noted by Goldberg, “the constructionist approach does not assume that language should be divided up into ‘core’ grammar and the to-be-ignored ‘periphery’” (2003: 223). Rather, CxG distinguishes itself by its “holistic framework: no one level of grammar is autonomous, or ‘core’” (Traugott and Trousdale 2013: 3).

The advantages of the Usage-based CxG will become apparent not just regarding the cross-clausal associations between C1 and C2 but, in fact, all linguistic variables discussed in this study. Thus, while MGG-based analyses have simply overlooked cross-clausal association phenomena, they take an explicitly *exclusive* stance on other aspects of the CC construction. Take clause order phenomena as an example: As noted in section 3.2.1, den Dikken has suggested that the CC’ construction (i.e., the C2C1 order) “should be kept separate from the comparative correlative”, based on the rather pedantic observation of a missing “correlative particle” (2005: 513). Similarly, Borsley has used the term “related construction” (2004: 75) to refer to the C2C1 order. Considering its semantics, however, the CC’ construction unquestionably belongs to the general CC constructional network; evidence from other languages (such as Polish and Slovak, cf. section 3.2.1) leaves little doubt about this.

Similarly, MGG-based analyses have dismissed tripartite CCs of Hoffmann’s Type C (i.e., without overt conjunctions between the subclauses) as ungrammatical by declaring a “ban on stacking” (den Dikken 2005: 504). Again, however, there is no doubt that tripartite CCs constitute an important part of the CC constructional network, evident from the corpus frequencies: In e.g. BrE, more than 6% of all CC tokens were of ‘Type C’ (cf. section 4.2.2) – a considerable proportion, especially given that in the same data set, *that*-complementizers made up only 1.42% of tokens. In contrast to the *exclusive* MGG-based approaches that rely on exceptions and bans, the Usage-based CxG approach to clause order phenomena is decidedly *inclusive* and therefore, considerably more satisfactory. The inclusive approach to the CC construction (and to all ‘peripheral’ constructions, for that matter) also entails using the term ‘construction-specific feature’ instead of the term that is commonly used in MGG-based studies, ‘idiosyncrasies’.

MGG-based analyses of the CC have also attempted to answer the question of whether it is a hypotactic or paratactic construction (cf. section 3.1). The evidence brought forward in many of these studies, optional *that*-complementizers and optional subject-auxiliary inversion (SAI), turned out to be highly infrequent features, making up no more than 2% (*that*-complementizers) or 10% (SAI) of C1C2 tokens in any of the corpora. These numbers have serious implications for analyses that rely on *that*-complementizers and SAI as evidence for hypotaxis: Their low frequency in the corpus data make it questionable whether they can really be used as conclusive evidence for hypotaxis. These findings were corroborated by the psycholinguistic experiments, which showed a clear preference for test items without any *that*-complementizers in them, an effect that was found to be consistent across all varieties (and DM stages, for that matter). Moreover, the fact that in the psycholinguistic experiments,

participants rated none of the four *that*-complementizer combinations across C1 and C2 as ungrammatical (but nevertheless with statistically significant differences, cf. section 5.1) suggests that the question is not *whether that*-complementizers are grammatical or ungrammatical, but *to what degree* they are (this question also applies to the other features that were investigated experimentally, asymmetric encoding and object pronoun extraction).

That is, the corpus study and psycholinguistic experiment results showed that rather than a simple binary grammatical–ungrammatical classification, the various *that*-complementizer combinations are perhaps better analyzed as being *more or less prototypical*. For example, the corpus and experimental evidence presented in chapters 4 and 5 suggests that CCs with no overt *that*-complementizers correspond to the most prototypical form (and hence, most grammatical), with the various alternatives (i.e., *that*– \emptyset , \emptyset –*that* and *that*–*that*) being less prototypical to varying degrees. Again, MGG-based approaches struggle with accounting for such evidence because of their exclusive approach: They presuppose that linguistic structures are either part of the language system (and thus, grammatical) or not (and thus, ungrammatical). In fact, the goal of MGG-based analyses has been explicitly stated “to separate the grammatical sequences which are the sentences of [a language] from the ungrammatical sequences which are not sentences of [a language]” (Chomsky 2002 [1957], as quoted by Hoffmann 2013b: 104: 13, emphasis JH). Obviously such an approach will run into trouble when dealing with *degrees of grammaticality*. Similarly, in the context of the hypotaxis vs. parataxis debate, it appears more appropriate (as discussed in chapter 3) to speak of *degrees of hypotaxis and parataxis*. That is, a continuum with two poles along which the CC constructions of various languages can be situated, with the English CC construction located close to the paratactic end, as is also evident from the preference of symmetric cross-clausal associations (as noted by Hoffmann 2019: 237). Hence Hoffmann et al.’s conclusion that there is “clear evidence that supports our claim that the *central properties* of Modern English CCs are paratactic, not hypotactic” (2020: 213, emphasis JH).

Again, it must be emphasized that the author’s intention is *not* a sweeping rebuttal of the various MGG-based analyses discussed here. It is acknowledged that these analyses work, in a sense that they have been able to account for most of the phenomena investigated in this study (with the notable exception of cross-clausal associations, which have been ignored so far). However, as will be demonstrated, the Usage-based CxG approach offers a theoretical framework with a considerably more inclusive and more efficient (i.e., less cumbersome) way of analyzing the CC and its construction-specific features.

This is perhaps better illustrated by returning to the cartography metaphor. The results of previous introspective studies might be compared to a 17th-century map of the Americas (Figure 6.1). Such maps were meticulously crafted based on the carefully recorded observations of many individuals, combined with guesswork to ‘connect the dots’ around uncharted territories. They were accurate in many respects, but simply lacked the precision that can be achieved with modern geodesic technology that is able to produce highly accurate maps (Figure 6.2). In analogy, the Usage-based CxG approach advocated in the present study represents a revolutionary new approach with a ‘toolbox’ of methods that allow researchers to ‘map out’ the language system more comprehensively and more accurately than ever before: The present study, for example, relies on falsifiable empirical evidence obtained by means of statistical analyses of large amounts of corpus data and the results of psycholinguistic experiments with several hundred participants.



Figure 6.1 Detail of a 17th-century map of the Americas (Frederik de Wit, 1660)



Figure 6.2 Modern map of North America, approximately showing the same area as in Figure 6.1 (United States Central Intelligence Agency 2001)

As will become apparent, these data sources and methods come with decisive advantages over those that rely entirely on the introspection of individuals. Thus, while introspective studies have provided many valuable insights and have described the CC construction in generally accurate terms, they have been lacking in other respects: As discussed earlier, they have completely overlooked the cross-clausal associations revealed by the corpus study (cf.

chapter 4) or the fact that none of the *that*-complementizer combinations across C1 and C2 were rated as ungrammatical in the psycholinguistic experiments (cf. chapter 5).

Of course, this leads to the question of how the findings from chapters 4 and 5 can be accounted for with a Usage-based CxG approach, and what exactly the advantages over reductionist approaches should be. In other words: How to map out the construct-i-con using the Usage-based CxG approach and describe the ‘machinery’ that allows for the potential of infinite creativity of language? And how exactly can the Usage-base CxG toolbox of methods be applied to the evidence to described the puzzle piece under scrutiny, the CC construction and its underlying mental network?

6.2 From corpus data and experimental results to (meso-)constructions

The key to answering the questions above is a concept known as *construction* (commonly abbreviated as ‘cxn’). As touched upon in section 1.2, constructions in a CxG sense are conventionalized form-meaning pairings encountered at various levels of linguistic analysis – that is, Saussurean signs of varying levels of abstractness. In fact, in CxG constructions are “the basic units of syntactic representation” (Boas 2010: 1; cf. also Traugott and Trousdale 2013: 3), having been described as “abstract grammatical units that can be seen as prototypes (‘blueprints’) representing hypotheses about speakers’ linguistic knowledge” (Fried 2017: 248). That is, they are assumed to be the fundamental building blocks of the language system, which in CxG is commonly described as a mental network¹: A “dynamic network of interconnected signs” (Diessel 2015: 296) that forms a “structured inventory of conventional linguistic units” (Langacker 2008: 222; cf. also Croft and Cruse 2004: 262). In its entirety this network constitutes the construct-i-con, the comprehensive ‘world map’ of linguistic knowledge – in Goldberg’s words, “[t]he totality of our knowledge of language” (2003: 223).

It is this inventory of constructions of various degrees of abstractness that allows speakers to produce, at least in theory, an infinite amount of grammatical sentences in a given language. Constructions, however, are not stored in speakers’ minds as isolated units. As discussed in chapter 1, each construction can be likened to a node in a network (cf. Croft and Cruse 2004: 262). These nodes are connected by inheritance links², which can be described as “taxonomic constraints and allow for categorizations at various levels of generality” (Traugott and Trousdale 2013: 59). Thus, underlying every realization on ‘the surface’ of language (i.e., the observable output of a speaker) there are usually several constructions, or rather: nodes of a network. This network is hierarchical in a sense that “[e]ach node inherits the properties of its dominating nodes” (Traugott and Trousdale 2013: 61), hence the terms *inheritance links* and *taxonomic constraints* to describe the connections between constructions. An important difference to MGG is thus the fact that “[c]onstruction grammars [...] are constraint-based, not rule-based” (Traugott and Trousdale 2013: 2).

In other words, underlying every concrete utterance that is encountered on the ‘surface’ of language (the micro-constructional level in CxG parlance; cf. Hoffmann et al. 2019: 26), there

1 It is important to keep in mind that the ‘network’ is a metaphor. As noted by Langacker, “[l]ike any metaphor, it is helpful in certain respects but potentially misleading in others” (2008: 227).

2 As noted in chapter 1, the literature distinguishes between two types of links, inheritance and relational. Relational links “specify the kinds of relations among constructions”, e.g. polysemy and metaphorical extension (Traugott and Trousdale 2013: 59). In the context of the present study, however, only inheritance links are of importance.

is a network of constructions of varying levels of abstractness, so called meso-constructions. Following the inheritance links all the way to the top of the network, one would eventually reach the “most schematic level possible” (Croft 2007: 484, as cited by Traugott and Trousdale 2013: 61): the macro-constructional level. Again, it must be stressed that “expressions typically inherit from several constructions”, hence the more precise term “multiple inheritance” (Traugott and Trousdale 2013: 61, emphasis JH).

Figure 6.3, expanding on an illustration from Croft and Cruse (2004: 264) shows how “constructions can be represented in a taxonomic hierarchy” (Croft and Cruse 2004: 264) using the example sentence *Sue baked Steve a cake* from Table 1.2 in chapter 1: Each box³ represents a ‘node’ in the network, that is, an entrenched construction. Note how the micro-construction⁴ *Sue baked Steve a cake* – that is, a “specific, substantive instance of a construction” (Hoffmann et al. 2019: 26) – inherits from several parent meso-constructions that each in turn inherit from several more abstract meso-constructions. Thus, behind the micro-construction *Sue baked Steve a cake* are at least four meso-constructions: The NOUN PHRASE construction, the PAST TENSE construction, the VERB PHRASE construction, and the DITRANSITIVE construction.

In the words of Croft and Cruse, “each construction [is] a partial specification of the grammatical structure of its daughter construction(s)” (2004: 264). Thus, the noun phrases *Sue* and *Steve* in the example sentence are specifications of the PROPER NOUN construction, which in turn is a specification of the NOUN PHRASE construction. Note that the notion of ‘partial specification’ also entails that each meso-construction only contributes its particular structure to the micro-construction (i.e., the output). In other words, multiple inheritance links are able to “capture the fact that all nonconflicting information between two related constructions is shared” (Goldberg 1995: 74-75, cited by Traugott and Trousdale 2013: 62). For example, the PAST TENSE construction only specifies the past tense suffix *-ed*; it does not specify anything about the complementation pattern, which is specified by the DITRANSITIVE construction, which in turn only specifies the syntactic structure [SBJ-TRVERB-OBJ₁-OBJ₂]. Of course, the network is much more complex than could be comprehensibly depicted on a two-dimensional page.

There are many more meso-constructions contributing to the micro-construction *Sue baked Steve a cake*, but in the interest of keeping the illustration informative and not too cluttered, only selected meso-constructions are shown in Figure 6.3. Similarly, not all manifestations of the various meso-constructions can be shown, although the gray boxes hint at further nodes in the network: Note, for example, how the DITRANSITIVE CONSTRUCTION specifies not only the prototypical template [SBJ-TRVERB-OBJ₁-OBJ₂] but also the template [SBJ-TRVERB-OBJ *to* NOUN PHRASE], which differs formally but carries the same ‘transfer’ meaning, i.e., [X CAUSE Y *to* RECEIVE Z]; Traugott and Trousdale therefore use the term “family of ditransitives” (2013: 62).

The next question is how constructions can be identified. The key concept here is entrenchment, a domain-general process already briefly discussed in section 1.2. Put very

3 Micro-constructions are not shown in boxes, since they are just utterances on the ‘surface’.

4 Some adherents of Usage-based CxG make a further distinction: Traugott and Trousdale, for example, suggest that “[m]icro-constructions, in turn, are instantiated in use by ‘constructs’”, which are “empirically attested tokens” (2013: 16), i.e., the corpus examples cited in the following. This distinction, however, will not be made here.

simply, a form-meaning pairing is considered a construction when it “occurs with sufficient frequency” (Goldberg 2006: 5). In fact, in Usage-based CxG, frequency plays a pivotal role as evidence for the existence of constructions: As Langacker noted, “with repeated use, a novel structure becomes progressively entrenched, to the point of *becoming a unit*; moreover, units are *variably entrenched depending on the frequency* of their occurrence” (1987: 59, emphasis JH). In other words, when a structure occurs often enough, it becomes entrenched and ultimately a unit: a construction. Obviously, frequencies in corpus data play a crucial role in this context. As Schmid notes,

frequencies of occurrence of [...] syntactic constructions in large corpora mirror degrees of entrenchment [...]. The rationale [...] is that frequencies of occurrence in large, balanced corpora not only can serve as an approximation of the kind of repetitiveness that the average speaker produces and is typically exposed to but can actually provide clues as to the potential effects of this exposure on the cognitive systems of individual speakers. (2016: 14)

In CxG-based research, corpora are the most important source of evidence for entrenchment, with obvious advantages: As Hoffmann notes, “[s]ince corpora easily allow hypotheses to be tested by different researchers the objectivity and falsifiability of this data source is [...] uncontroversial” (2006: 168).

An important distinction in this context is type and token frequency: Whereas token frequency is evidence for specific and substantive constructions, type frequency is evidence of the entrenchment of more abstract constructions. Thus, in Figure 6.3 the sentence *Sue baked Steve a cake* is a token of the ditransitive construction (and of course, of all the other meso-constructions from which it inherits). Other examples of the ditransitive construction are *I will bake him cookies* and *She bought him an ice cream*. If these three example sentences were to appear in a corpus as tokens, they could then be used to determine types – in this case, the ditransitive construction [SBJ-TRVERB-OBJ₁-OBJ₂]. Thus, type frequency plays a crucial role in identifying types, or meso-constructions: If structures “have been encountered with many different lexicalizations [i.e., tokens]”, this will lead “to the entrenchment of [...] more abstract constructions [i.e., types]” (Hoffmann 2019: 9). In other words, the higher the frequency, the more entrenched a (meso-)construction is. But things are not as simple as they might appear at first sight: Entrenchment is a gradual process and there is no agreement in the literature about a particular frequency threshold that must be crossed to make a structure a construction in its own right. Moreover, there is an ongoing debate in the literature whether absolute frequencies or relative frequencies should be used to determine entrenchment (cf. Schmid 2016: 16).

In the context of the present study, the question about frequency thresholds therefore has to be rephrased: The statistical analyses that were employed work with relative frequencies. As discussed in section 2.1.1.2, covarying-collexeme analysis, for example, “compares actual frequencies of co-occurrence with expected ones” (Stefanowitsch and Gries 2005: 9). That is, a syntagm is compared *relative* to all other possible instantiations (cf. section 2.1.1.2). Thus, the question is not what absolute frequency should be used as sufficient evidence for the existence of a construction, but how the results statistical analyses should be interpreted.

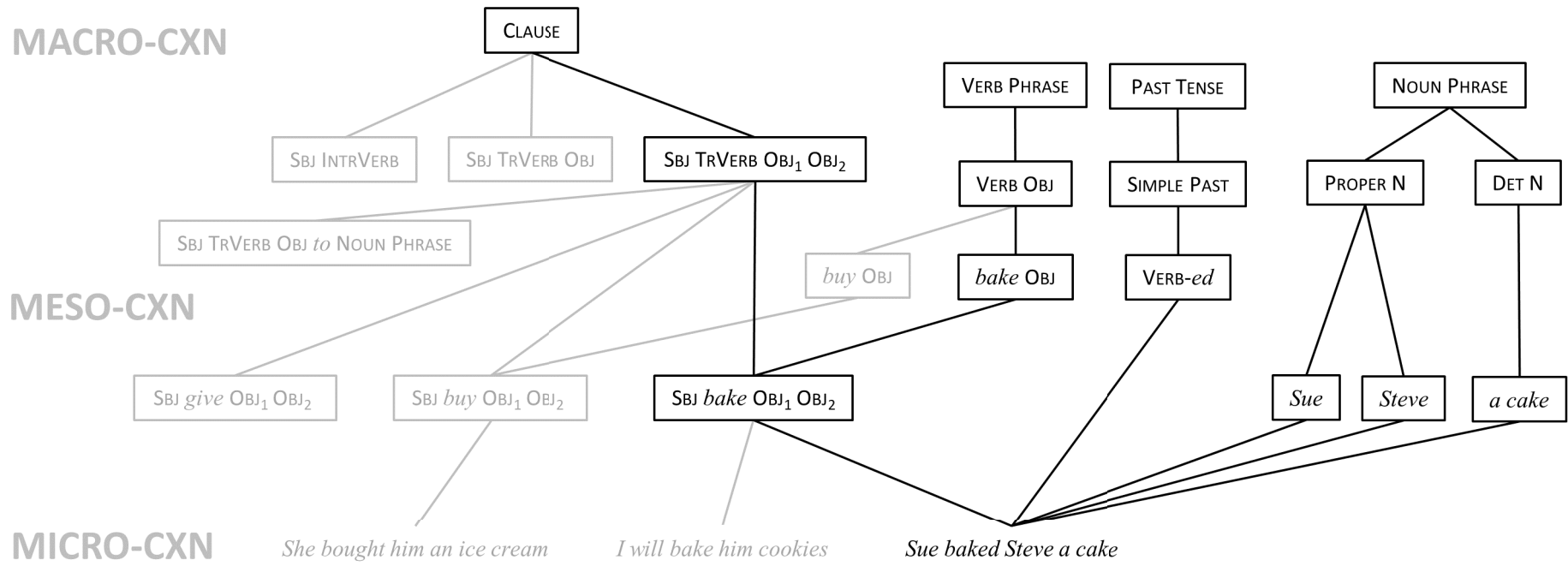


Figure 6.3 Example of a multiple-inheritance network

For the sake of simplicity and following convention in the literature, a p -value of 0.05 was universally used as a significance threshold in the various statistical tests⁵ that were employed. Additionally, for results yielded by covarying-collexeme analyses three p -value thresholds were used to differentiate degrees of entrenchment, allowing for a more fine-grained distinction (cf. chapter 2):

- p -value of 0.001 = collostructional strength value of 3 (***)
- p -value of 0.01 = collostructional strength value of 2 (**)
- p -value of 0.05 = collostructional strength value of 1.30103 (*)

In the constructional networks that will be presented in this chapter as illustrations these three p -value thresholds will be visualized using boxes of varying thickness⁶, such that each box represents a node in the network and deeper entrenchment (i.e., higher p -values) is indicated by thicker lines around the boxes. Keeping in mind the caveats of using arbitrarily selected p -value thresholds as evidence for entrenchment (see the discussion in section 2.1.1.2), with this methodology it will be possible to determine the existence of constructions and their degrees of entrenchment, and visualize the network they form – in short, to shed light on constructional networks and thus explore the construct-i-con of a language.

This leaves the question how the psycholinguistic experiment results are to be interpreted, or more precisely, how they can serve as evidence for entrenchment. In this case, the assumption is that “more frequent exemplars of a syntactic entity are more likely to become more deeply entrenched”, thus “receiving higher acceptability judgments” (Hoffmann 2013b: 105). As with the corpus data, statistical analyses were used to determine entrenchment following Hoffmann, who noted that “statistically significant differences in judgments can [...] be interpreted as differences in degree of entrenchment of grammatical constructions” (2013b: 105). To provide a more refined picture, the experiments also featured grammatical and ungrammatical fillers (see section 2.1.2 and chapter 5). The idea behind this was “to contrast the judgment scores of the experimental items with those of the distractors/fillers” so that “the set of grammatical and ungrammatical fillers constitute the background against which the effects of the experimental stimuli need to be interpreted” (Hoffmann 2013b: 105). Thus, higher MET acceptability ratings can be interpreted as higher degrees of entrenchment.

Having clarified how the entrenchment of constructions and degrees thereof can be determined using the evidence presented in chapters 4 and 5, it is now possible to begin identifying concrete meso-constructions and the network they form.

6.3 The constructional network of the English CC construction

In the following, based on evidence from the corpus study and MET experiments as well as previous Usage-based CxG investigations of the English CC construction (Hoffmann 2019; Hoffmann et al. 2019, 2020), a comprehensive account of the English CC’s constructional network will be provided. Each (meso-)construction that could be determined using statistical analysis will be presented as a form-meaning pairing, based on Hoffmann’s paraphrasing of the CC meaning (2017b: 351) and Hoffmann et al.’s meso-constructional templates (2019: 26-31). Note that in the interest of keeping the CC network illustrations as concise as possible,

5 The reader is referred to chapter 2 for a detailed description of how frequencies translate to p -values yielded by statistical tests.

6 Using boxes of varying thickness to visualize different degrees of entrenchment has been suggested previously, e.g. by Langacker (2008: 226).

they will not show construction meanings and sometimes only use a construction's conventional designation instead of providing its full form (e.g. 'C1C2' instead of [[ðə []_{comparative phrase 1} (clause₁)]_{C1} [ðə []_{comparative phrase 2} (clause₂)]_{C2}]_{CC}), unlike the ditransitive network in Figure 6.3. Accordingly, Figure 6.4 shows the basic layout of the English CC network without displaying meaning and form (which are, however, fully shown in the corresponding form-meaning pairings that are provided separately).

Beginning with the “schematic macro-construction” (Hoffmann et al. 2019: 26), template (6.1), adapted from (1.25) from chapter 1, shows this maximally abstract CC construction. Note that it has been slightly changed from Hoffmann et al.'s (2019) original form so that it can specify both the CC and the CC' construction: The '|' between C1 and C2 in the template indicates that the two subclauses can be realized in either order. Also note that on the meaning side of this construction, the clause is indicated as being optional by including the alternative formulation 'with respect to a contextually retrievable clause' for cases where no clause is realized, thereby accounting for truncation phenomena where the clause is not realized (this minor inconsistency was overlooked by Hoffmann et al. (2019)). As shown in Figure 6.4, this CC macro-construction enables speakers “to produce the wide range of creative CCs” (Hoffmann et al. 2019: 26): It is the progenitor of a family of CC constructions, specifying the CC construction, in which the subclauses follow a cause-effect order, as well as the CC' construction, in which this order is reversed. Note that, as discussed in section 6.1 above, the decision to include the CC' construction in the overall CC constructional network is based less on formal similarities and more on the fact that it expresses the same semantics. That is, in this case a generalization is made based on shared *meaning* (where usually, generalizations are based on common *form*). While an approach from this angle may be less common, its viability has been proven previously: In his investigation of the ditransitive alternation, Perek demonstrated by means of a sorting task experiment that “generalizations of a common meaning between formally different constructions are plausible categories stored by speakers” (2012: 602)⁷. Thus, it is possible to accommodate both the iconic C1C2 as well as the non-iconic, reversed C2C1 order in the constructional network of the CC. It is worth noting at this point that neither reductionist approaches, which cannot account for movement of a whole clause, nor templates like Culicover and Jackendoff's (1999: 567), which only account for the C1C2 order, are able to accommodate CC' constructions. Rather, it seems more plausible that speakers “have stored [...] two constructional templates” (Hoffmann 2019: 48) that correspond to the C1C2 and the C2C1 orders, which inherit from a more abstract CC construction at the macro-level (see above)⁸.

The two abstract macro-constructions specify the bi-clausal meso-constructions (6.2) and (6.3). Note that it is assumed that the latter meso-construction fulfills an additional pragmatic function (as discussed in section 3.2.1) such that “the comparative phrase of C2 is focused” (Hoffmann 2019: 157). Accordingly, the comparative phrase of C2 has been labeled with 'FOCUS'. The focus function of the CC' construction is also of importance when accounting

7 It might be added that in this context, it seems appropriate to describe the C1C2 and C2C1 orders as an instance of syntactic alternation.

8 Interestingly, MGG-based approaches appear to take little issue with similar phenomena (i.e., relatedness in meaning but formal differences between constructions) on the morphological level. Concerning suppletion (e.g. *go-went* or *bad-worse*), for example, there is hardly any doubt about the completely different forms belonging to the same construction due to semantic relatedness.

for differences in productivity between C1C2 and C2C1. Recall that LNRE modeling (cf. section 4.2.1) was used to test Hoffmann’s hypothesis that “the iconic C1C2 CC construction is also much more productive than the non-iconic C2C1 CC’ construction in PdE” (2019: 71). However, in the COCA data the LNRE models revealed the C2C1 order to be slightly more productive than C1C2 (cf. section 4.2.1.1), and considerably more productive in the BNC and GloWbE data (cf. sections 4.2.1.2 and 4.2.1.3). While these results quite clearly contradict Hoffmann’s hypothesis that the C1C2 order should be more productive (see above), there is a possible explanation based on processing effects:

(6.1) CC macro-cxn	
FORM:	$[[\delta\theta []_{\text{comparative phrase 1}} (\text{clause}_1)]_{C1} [(\delta\theta) []_{\text{comparative phrase 2}} (\text{clause}_2)]_{C2}]_{CC}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁ /with respect to a contextually retrievable clause] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂ /with respect to a contextually retrievable clause] _{dependent variable} in a monotonic way’
(6.2) BI-CLAUSAL CC macro-cxn	
FORM:	$[[\delta\theta []_{\text{comparative phrase 1}} (\text{clause}_1)]_{C1} [\delta\theta []_{\text{comparative phrase 2}} (\text{clause}_2)]_{C2}]_{CC}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁ /with respect to a contextually retrievable clause] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂ /with respect to a contextually retrievable clause] _{dependent variable} in a monotonic way’
(6.3) BI-CLAUSAL CC’ macro-cxn (Hoffmann 2019: 49)	
FORM:	$[(\text{clause}_2) (\delta\theta) []_{\text{comparative phrase 2_FOCUS}}]_{C2_main\ clause} [\delta\theta []_{\text{comparative phrase 1_i}} (\dots t_i \dots)]_{C1_subordinate\ clause}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁ /with respect to a contextually retrievable clause] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂ /with respect to a contextually retrievable clause] _{dependent variable} in a monotonic way’

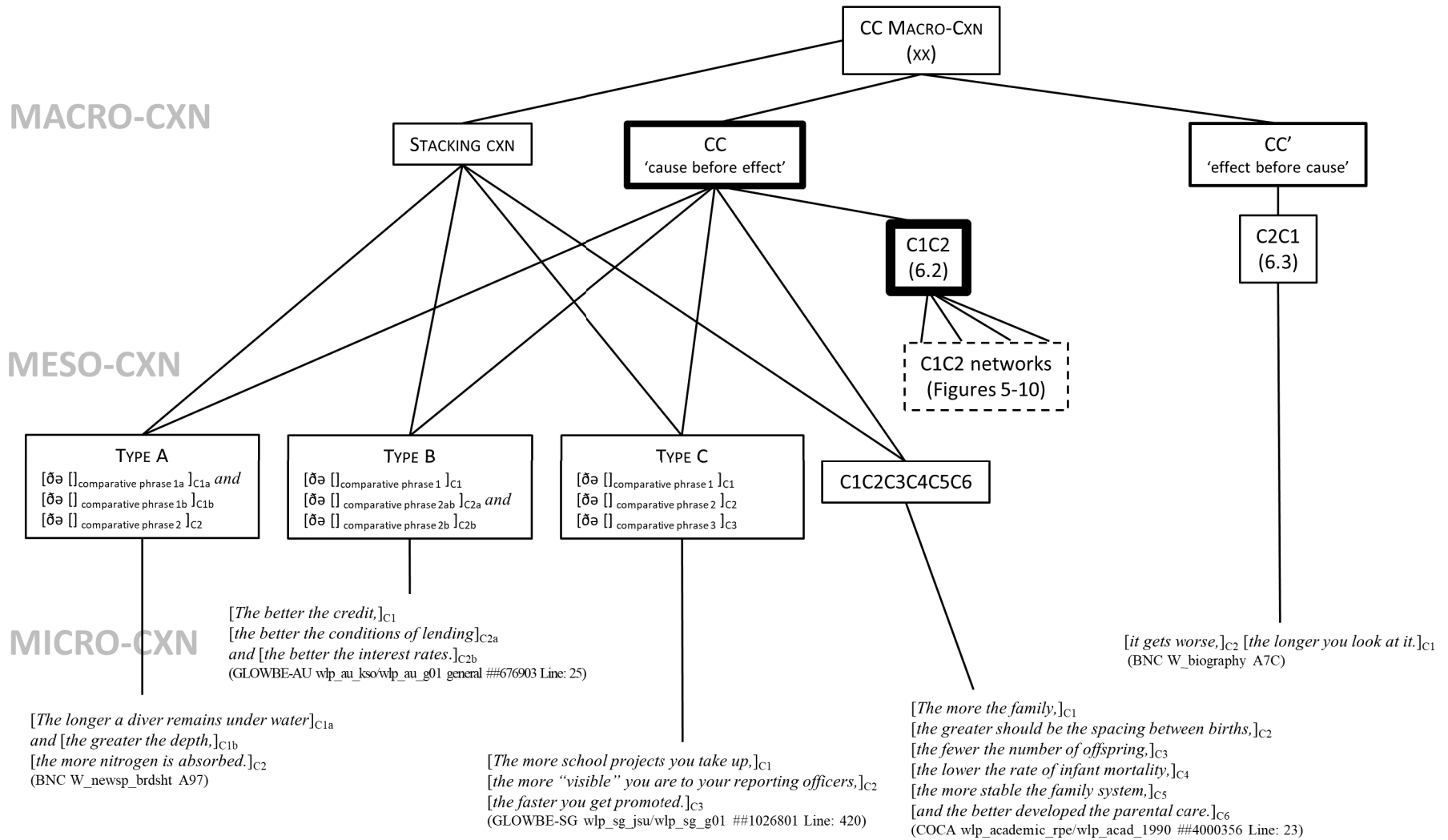


Figure 6.4 Basic CC network

The C2C1 order noticeably deviates from the iconic and ‘unmarked’ (as implied by the corpus frequencies) C1C2 order. As discussed in section 3.2.1, the “principle of emphasis” (Firbas 1992) holds that unusual constituent orders – and this includes the inversion of subclauses to create a C2C1 order – are used by speakers to create an utterance that “strikes the recipient as more or less out of the ordinary” (1992: 118). Thus it is possible that when speakers employ the C2C1 order, they do so deliberately and more consciously. The C1C2 order, on the contrary, is used by speakers less consciously and in a more automated fashion, relying on many more entrenched lexical filler meso-constructions (see section 4.3.1 for an overview).

The increased use of these ‘prefabricated’ lexical filler patterns, e.g. periphrastic $more_{C1} \times more_{C2}$, means less variation in the lexical filler slot and thus, less productivity. When speakers use the C2C1 order, however, they are more aware of the utterance they are producing, relying less on entrenched meso-constructions, which in turn manifests itself in higher productivity. This is also supported by the results of LNRE modeling of the C1 and C2 lexical filler slots separately. As it turns out, across all corpora the C2 slot was considerably more productive in the C2C1 data set when compared to the C1C2 data set. Again this can be explained with the focus function of the CC’ construction. Recall that the focused element is the comparative phrase in C2, which thus receives particular attention when the string is produced by a speaker. Being produced more consciously than the C1 lexical filler slot, its C2 counterpart is therefore even less likely to be realized using entrenched ‘prefabricated’ material.

Moving on to stacked CCs, a separate, highly schematic STACKING construction is suggested that licenses multiple subclauses and specifies Hoffmann’s TYPE A (6.4), TYPE B (6.5), and TYPE C (6.6) (cf. 2019: 103-104) as meso-constructions, as well as more complex stacked structures – illustrated here by an example of a C1C2C3C4C5C6 structure from the corpus data. Each of these meso-constructions inherits from the more abstract STACKING meso-construction as well as the CC ‘cause-before-effect’ meso-construction. Concrete corpus examples that exemplify these stacked CCs are shown on the micro-constructional level. Note that the same stacking meso-construction also licenses stacked CC’ constructions (e.g. C3C2C1), which are not shown in Figure 6.4. Thus, again the advantage of the inclusive CxG approach becomes evident: Instead of a “ban on stacking” (den Dikken 2005: 503), stacked structures such as C1C2C3 can be easily accommodated in the constructional network as part of the CC constructional family, based on the unmistakable formal and semantic similarities.

Here, the varying thickness of the boxes in Figure 6.4 is based on the absolute frequencies determined in the corpus study: Thus, in the illustration the box around the iconic (that is, ‘cause-before-effect’) CC construction has thicker lines than that of the non-iconic CC’ (‘effect-before-cause’) construction, indicating that the former is more deeply entrenched. Similarly, reflecting the fact that stacked CCs were less frequent than bi-clausal CCs in the corpus data, the latter have thicker boxes. The thickest box, indicating the highest degree of entrenchment, contains the meso-construction that has been described as the “canonical” CC (Hoffmann 2019: 3): the bi-clausal CC with the iconic C1C2 order (6.2) that corresponds to Culicover and Jackendoff’s template (1999: 567).

(6.4) TYPE A STACKING meso-cxn

FORM: $[\delta\partial \square]_{\text{comparative phrase 1a (clause}_{1a})}C1a$ *and* $[\delta\partial \square]_{\text{comparative phrase 1b (clause}_{1b})}C1b$
 $[\delta\partial \square]_{\text{comparative phrase 2 (clause}_{2})}C2$

MEANING: ‘[As the degree of comparative phrase 1a increases/decreases with respect to clause_{1a}/with respect to a contextually retrievable clause]_{independent variable} and
 [as the degree of comparative phrase 1b increases/decreases with respect to clause_{1b}/with respect to a contextually retrievable clause]_{independent variable}
 → [so the degree of comparative phrase 2 increases/decreases with respect to clause₂/with respect to a contextually retrievable clause]_{dependent variable} in a monotonic way’

(6.5) TYPE B STACKING meso-cxn

FORM: $[\delta\partial \square]_{\text{comparative phrase 1 (clause}_1)}C1$
 $[\delta\partial \square]_{\text{comparative phrase 2a (clause}_{2a})}C2a$ *and* $[\delta\partial \square]_{\text{comparative phrase 2b (clause}_{2b})}C2b$

MEANING: ‘[As the degree of comparative phrase 1 increases/decreases with respect to clause₁/with respect to a contextually retrievable clause]_{independent variable}
 → [so the degree of comparative phrase 2a increases/decreases with respect to clause_{2a}/with respect to a contextually retrievable clause]_{dependent variable} in a monotonic way and
 [so the degree of comparative phrase 2b increases/decreases with respect to clause_{2b}/with respect to a contextually retrievable clause]_{dependent variable} in a monotonic way’

(6.6) TYPE C STACKING meso-cxn

FORM: $[\delta\partial \square]_{\text{comparative phrase 1 (clause}_1)}C1$ $[\delta\partial \square]_{\text{comparative phrase 2 (clause}_2)}C2$
 $[\delta\partial \square]_{\text{comparative phrase 3 (clause}_3)}C3$

MEANING: ‘[As the degree of comparative phrase 1 increases/decreases with respect to clause₁/with respect to a contextually retrievable clause]_{independent variable}
 → [so the degree of comparative phrase 2 increases/decreases with respect to clause₂/with respect to a contextually retrievable clause]_{dependent variable} in a monotonic way,
 [and as the degree of comparative phrase 2 increases/decreases with respect to clause₂/with respect to a contextually retrievable clause]_{independent variable}
 → [so the degree of comparative phrase 3 increases/decreases with respect to clause₃/with respect to a contextually retrievable clause]_{dependent variable} in a monotonic way’

In addition to featuring the thickest box lines, this meso-construction is situated at the center of the network, indicating that it is the most prototypical of all variants of the CC – that is, this is the best representative of the CC construction (cf. Traugott and Trousdale 2013: 74 for an overview of how prototype theory relates to Usage-based CxG). Note that it specifies numerous less abstract meso-constructions, i.e., the various cross-clausal associations uncovered by the corpus study. To keep the illustration from becoming too complex, these are presented in separate network illustrations, based on the illustration in Hoffmann et al. (2019: 32), in Figures 6.5 and 6.7-6.10 below. These network illustrations illustrate cross-clausal interactions and are based on the assumption that that “each significant interaction represents a separate node in the [...] constructional network” (2020: 21). Figure 6.5 is the first of these network illustrations and summarizes the results of the corpus study for the standard varieties AmE and BrE: It shows the various meso-constructions that manifested themselves as cross-clausal associations in the COCA, BNC, and GloWbE-GB data. It also shows how these meso-constructions are interrelated, i.e., the underlying multiple-inheritance network. The right side of the illustration shows the meso-constructions that correspond to the filler type patterns that were determined as significant in the corpus study (cf. section 4.3.2): $ADV_{C1} \times ADV_{C2}$ (6.7), $NP_{C1} \times NP_{C2}$ (6.8), and $ADJP_{C1} \times ADJP_{C2}$ (6.9).

These FILLER TYPE meso-constructions then specify less abstract meso-constructions that correspond to the various interactions that emerged as significant in the corpus study (cf. sections 4.3.4 and 4.3.5). The corresponding inheritance links are rendered as square dot lines for better distinction from the inheritance links pertaining to deletion/truncation patterns, which are rendered as dashed lines. As noted in section 6.2., the thickness of the boxes around each meso-construction corresponds to their degree of entrenchment as evidenced by collostructional strength (see legend in the bottom right corner of the illustration). Also note that there are hardly any differences between BrE and AmE, or between the three corpora (COCA, BNC, and GloWbE), so that the results could be summarized in one figure. In fact, the only difference can be found in three meso-constructions (6.13, 6.23 and 6.24) that were only found in BNC. All of the remaining meso-constructions were found across all varieties and in all corpora. This is unsurprising, however, given that in the context of the “core probabilistic grammar” (Szmrecsányi et al. 2016) it has been found that “different [syntactic] preferences between varieties, have been argued to necessarily be subtle in nature” (Laporte 2019: 272) (cf. also the discussion in section 5.1). It also underscores the fact that across varieties, the same domain-general effects affect the form of the CC construction, a point discussed in more detail at the end of this section.

(6.7) $ADV_{C1} \times ADV_{C2}$ meso-cxn	
FORM:	$[\delta\partial []_{AdvP1} (clause_1)]_{C1} [\delta\partial []_{AdvP2} (clause_2)]_{C2}]_{CC}$
MEANING:	‘[As the degree of AdvP1 increases/decreases with respect to clause ₁ /with respect to a contextually retrievable clause] _{independent variable} → [so the degree of AdvP2 increases/decreases with respect to clause ₂ /with respect to a contextually retrievable clause] _{dependent variable} in a monotonic way’

(6.8) NP_{C1} × NP_{C2} meso-cxn

FORM: [ðə []_{NP1} (clause₁)]_{C1} [ðə []_{NP2} (clause₂)]_{C2}]_{CC}

MEANING: ‘[As the degree of NP1 increases/decreases
with respect to clause₁/with respect to a contextually retrievable clause]_{independent variable}
→ [so the degree of NP2 increases/decreases
with respect to clause₂/with respect to a contextually retrievable clause]_{dependent variable}
in a monotonic way’

(6.9) ADJP_{C1} × ADJP_{C2} meso-cxn

FORM: [ðə []_{AdjP1} (clause₁)]_{C1} [ðə []_{AdjP2} (clause₂)]_{C2}]_{CC}

MEANING: ‘[As the degree of AdjP1 increases/decreases
with respect to clause₁/with respect to a contextually retrievable clause]_{independent variable}
→ [so the degree of AdjP2 increases/decreases
with respect to clause₂/with respect to a contextually retrievable clause]_{dependent variable}
in a monotonic way’

Continuing with deletion/truncation patterns, Figure 6.5 shows that in the standard varieties AmE and BrE five meso-constructions of varying degrees of entrenchment could be determined: FULL CLAUSE_{C1} × FULL CLAUSE_{C2} (6.10), BE-RETAINED MV_{C1} × BE-RETAINED MV_{C2} (6.11), BE-DELETED MV_{C1} × BE-DELETED MV_{C2} (6.12), BE-RETAINED AUX_{C1} × BE-RETAINED AUX_{C2} (6.13), and TRUNCATED_{C1} × TRUNCATED_{C2} (6.14).

(6.10) FULL CLAUSE_{C1} × FULL CLAUSE_{C2} meso-cxn

FORM: [ðə []_{comparative phrase 1} clause₁]_{C1} [ðə []_{comparative phrase 2} clause₂]_{C2}]_{CC}

MEANING: ‘[As the degree of comparative phrase 1 increases/decreases
with respect to clause₁]_{independent variable}
→ [so the degree of comparative phrase 2 increases/decreases
with respect to clause₂]_{dependent variable} in a monotonic way’

(6.11) BE-RETAINED MV_{C1} × BE-RETAINED MV_{C2} meso-cxn

FORM: [ðə []_{comparative phrase 1} BE NP₁]_{C1} [ðə []_{comparative phrase 2} BE NP₂]_{C2}]_{CC}

MEANING: ‘[As the degree of comparative phrase 1 increases/decreases
with respect to NP₁]_{independent variable}
→ [so the degree of comparative phrase 2 increases/decreases
with respect to NP₂]_{dependent variable} in a monotonic way’

Note that, following Hoffmann et al. (2019), the meaning side of the $\text{TRUNCATED}_{C1} \times \text{TRUNCATED}_{C2}$ meso-construction accounts for the missing clause by making reference to the context in which the CC is embedded ('with respect to a contextually retrievable clause'), since a clause that would provide this information is not realized in this case. As with the FILLER TYPE meso-constructions, these deletion and truncation patterns specify slightly less abstract meso-constructions, which inherit from both FILLER TYPE and DELETION/TRUNCATION meso-constructions. This is evident from the multiple inheritance links that lead to the boxes that capture the interactions between FILLER TYPE and DELETION/TRUNCATION.

(6.12) BE-DELETED $MV_{C1} \times$ BE-DELETED MV_{C2} meso-cxn

FORM: $[\text{ðə } []_{\text{comparative phrase 1}} \text{ NP}_1]_{C1} [\text{ðə } []_{\text{comparative phrase 2}} \text{ NP}_2]_{C2}]_{CC}$

MEANING: 'As the degree of comparative phrase 1 increases/decreases with respect to NP_1]_{independent variable}
 → [so the degree of comparative phrase 2 increases/decreases with respect to NP_2]_{dependent variable} in a monotonic way'

(6.13) BE-RETAINED $AUX_{C1} \times$ BE-RETAINED AUX_{C2} meso-cxn

FORM: $[\text{ðə } []_{\text{comparative phrase 1}} \text{ BE}_{\text{aux}} \text{ NP}_1]_{C1} [\text{ðə } []_{\text{comparative phrase 2}} \text{ BE}_{\text{aux}} \text{ NP}_2]_{C2}]_{CC}$

MEANING: 'As the degree of comparative phrase 1 increases/decreases with respect to NP_1]_{independent variable}
 → [so the degree of comparative phrase 2 increases/decreases with respect to NP_2]_{dependent variable} in a monotonic way'

(6.14) $\text{TRUNCATED}_{C1} \times \text{TRUNCATED}_{C2}$ meso-cxn

FORM: $[\text{ðə } []_{\text{comparative phrase 1}}]_{C1} [\text{ðə } []_{\text{comparative phrase 2}}]_{C2}]_{CC}$

MEANING: 'As the degree of comparative phrase 1 increases/decreases with respect to a contextually retrievable clause₁]_{independent variable}
 → [so the degree of comparative phrase 2 increases/decreases with respect to a contextually retrievable clause₂]_{dependent variable} in a monotonic way'

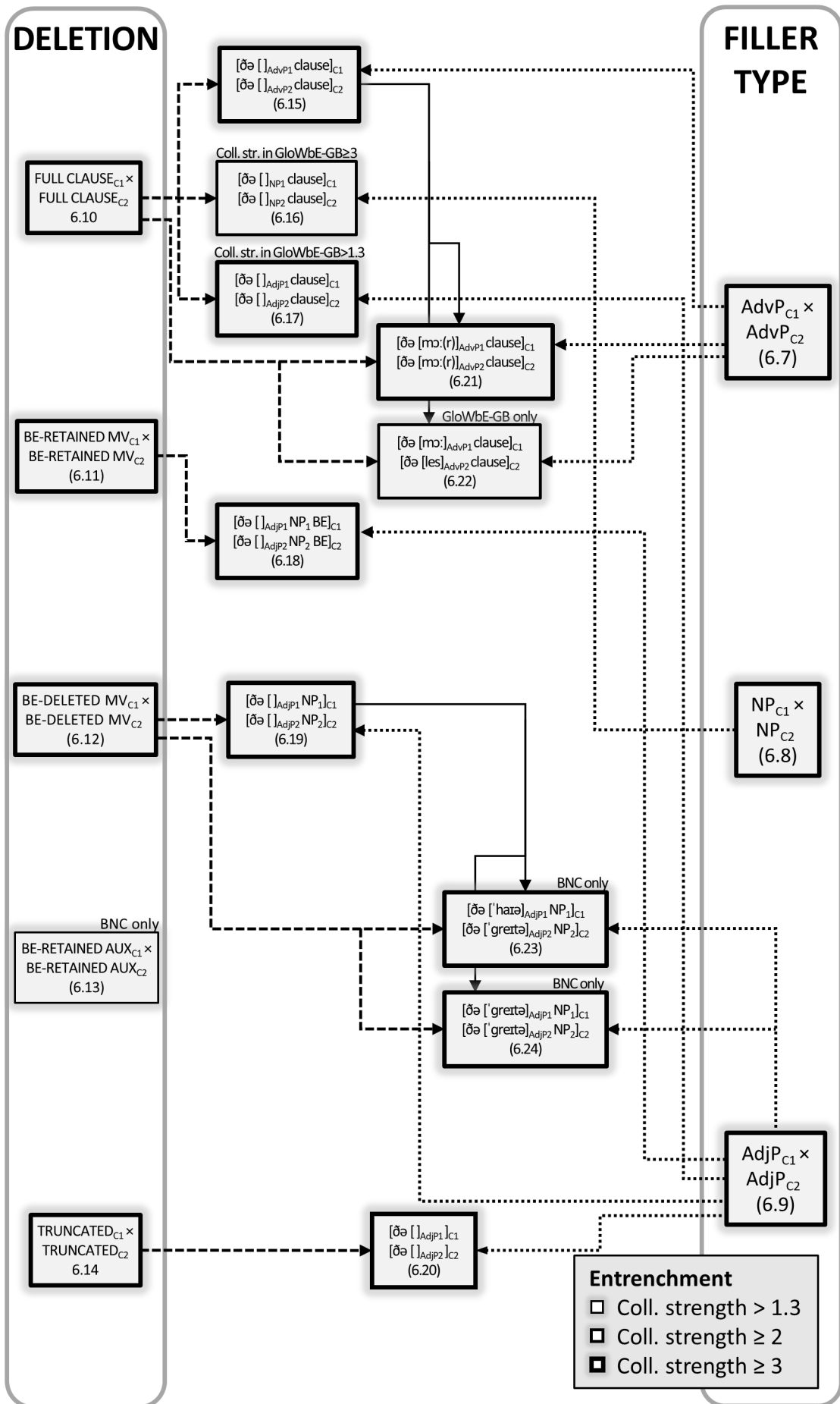


Figure 6.5 AmE and BrE CC network (based on data from COCA, BNC, and GloWbE)

(6.15) ADVP_{C1}-FULL CLAUSE_{C1} × ADVP_{C2}-FULL CLAUSE_{C2} meso-cxn	
FORM:	[ðə [] _{AdvP1} clause ₁] _{C1} [ðə [] _{AdvP2} clause ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way’

(6.16) NP_{C1}-FULL CLAUSE_{C1} × NP_{C2}-FULL CLAUSE_{C2} meso-cxn	
FORM:	[ðə [] _{NP1} clause ₁] _{C1} [ðə [] _{NP2} clause ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way’

(6.17) ADJP_{C1}-FULL CLAUSE_{C1} × ADJP_{C2}-FULL CLAUSE_{C2} meso-cxn	
FORM:	[ðə [] _{AdjP1} clause ₁] _{C1} [ðə [] _{AdjP2} clause ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way’

(6.18) ADJP_{C1}-BE-RETAINED MV_{C1} × ADJP_{C2}-BE-RETAINED MV_{C2} meso-cxn	
FORM:	[ðə [] _{AdjP1} NP ₁ BE-MV ₁] _{C1} [ðə [] _{AdjP2} NP ₂ BE-MV ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause ₂] _{dependent variable} in a monotonic way’

Thus, the boxes located in the area between the DELETION and FILLER TYPE meso-constructions show the ADVP_{C1}-FULL CLAUSE_{C1} × ADVP_{C2}-FULL CLAUSE_{C2} (6.15), NP_{C1}-FULL CLAUSE_{C1} × NP_{C2}-FULL CLAUSE_{C2} (6.16), and ADJP_{C1}-FULL CLAUSE_{C1} × ADJP_{C2}-FULL CLAUSE_{C2} (6.17) meso-constructions. Further meso-constructions that inherit from the more abstract FILLER TYPE and DELETION/TRUNCATION meso-constructions are the ADJP_{C1}-BE-RETAINED MV_{C1} × ADJP_{C2}-BE-RETAINED MV_{C2} (6.18), ADJP_{C1}-BE-DELETED

$MV_{C1} \times ADJP_{C2}\text{-BE-DELETED } MV_{C2}$ (6.19), and $ADJP_{C1}\text{-TRUNCATED}_{C1} \times ADJP_{C2}\text{-TRUNCATED}_{C2}$ (6.20) meso-constructions.

(6.19) $ADJP_{C1}\text{-BE-DELETED } MV_{C1} \times ADJP_{C2}\text{-BE-DELETED } MV_{C2}$ meso-cxn	
FORM:	$[\delta\partial []_{AdjP1} NP_1]_{C1} [\delta\partial []_{AdjP2} NP_2]_{C2}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to NP_1] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to NP_2] _{dependent variable} in a monotonic way’

(6.20) $ADJP_{C1}\text{-TRUNCATED}_{C1} \times ADJP_{C2}\text{-TRUNCATED}_{C2}$ meso-cxn	
FORM:	$[\delta\partial []_{AdjP1}]_{C1} [\delta\partial []_{AdjP2}]_{C2}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to a contextually retrievable clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to a contextually retrievable clause ₂] _{dependent variable} in a monotonic way’

Finally, in the context of the corpus study various three-way interactions between FILLER TYPE, DELETION/TRUNCATION, and LEXICAL FILLER emerged as significant, providing evidence for the existence of the following meso-constructions: $more_{AdvP_{C1}} + FULL\ CLAUSE_{C1} - more_{AdvP_{C2}} + FULL\ CLAUSE_{C2}$ (6.21), $more_{AdvP_{C1}} + FULL\ CLAUSE_{C1} - less_{AdvP_{C2}} + FULL\ CLAUSE_{C2}$ (6.22), $higher_{AdjP_{C1}} + BE\text{-DELETED } MV_{C1} - greater_{AdjP_{C2}} + BE\text{-DELETED } MV_{C2}$ (6.23), and $greater_{AdjP_{C1}} + BE\text{-DELETED } MV_{C1} - greater_{AdjP_{C2}} + BE\text{-DELETED } MV_{C2}$ (6.24). Note that each of these meso-constructions inherits from three more abstract meso-constructions, as is evident from the three inheritance links leading to each corresponding box. For example, the $more_{AdvP_{C1}} + FULL\ CLAUSE_{C1} - more_{AdvP_{C2}} + FULL\ CLAUSE_{C2}$ meso-construction (6.21) inherits from the following more abstract meso-constructions: $FULL\ CLAUSE_{C1} \times FULL\ CLAUSE_{C2}$ (6.10), $ADV_{C1} \times ADV_{C2}$ (6.7), and $ADV_{C1}\text{-FULL } CLAUSE_{C1} \times ADV_{C2}\text{-FULL } CLAUSE_{C2}$ (6.15).

(6.21) $more_{AdvP_{C1}} + FULL\ CLAUSE_{C1} - more_{AdvP_{C2}} + FULL\ CLAUSE_{C2}$ meso-cxn	
FORM:	$[\delta\partial [m\partial:(r)]_{AdvP1} clause_1]_{C1} [\delta\partial [m\partial:(r)]_{AdvP2} clause_2]_{C2}$
MEANING:	‘[As the degree of comparative phrase 1 increases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 increases with respect to clause ₂] _{dependent variable} in a monotonic way’

(6.22) <i>more</i> _{AdvP_C1} + FULL CLAUSE _{C1} – <i>less</i> _{AdvP_C2} + FULL CLAUSE _{C2} meso-cxn	
FORM:	[ðə [mɔː] _{AdvP1} clause ₁] _{C1} [ðə [les] _{AdvP2} clause ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases with respect to clause ₁] _{independent variable} → [so the degree of comparative phrase 2 decreases with respect to clause ₂] _{dependent variable} in a monotonic way’
(6.23) <i>higher</i> _{AdjP_C1} + BE-DELETED MV _{C1} – <i>greater</i> _{AdjP_C2} + BE-DELETED MV _{C2} meso-cxn	
FORM:	[ðə [ˈhaɪə] _{AdvP1} NP ₁] _{C1} [ðə [ˈgreɪə] _{AdvP2} NP ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases with respect to NP ₁] _{independent variable} → [so the degree of comparative phrase 2 decreases with respect to NP ₂] _{dependent variable} in a monotonic way’
(6.24) <i>greater</i> _{AdjP_C1} + BE-DELETED MV _{C1} – <i>greater</i> _{AdjP_C2} + BE-DELETED MV _{C2} meso-cxn	
FORM:	[ðə [ˈgreɪə] _{AdvP1} NP ₁] _{C1} [ðə [ˈgreɪə] _{AdvP2} NP ₂] _{C2}
MEANING:	‘[As the degree of comparative phrase 1 increases with respect to NP ₁] _{independent variable} → [so the degree of comparative phrase 2 decreases with respect to NP ₂] _{dependent variable} in a monotonic way’

To better illustrate the interplay of meso-constructions at various levels of abstractness, Figure 6.6 uses the example sentence *The more you give, the more you get* from GloWbE-AU (with no degrees of entrenchment being shown). As the network illustration shows, this micro-construction inherits directly from (6.21), which in turn inherits from three meso-constructions, (6.7), (6.10), and (6.15). The latter also inherits from (6.7) and (6.10). Moving upwards, (6.7) and (6.10) both inherit from the BI-CLAUSAL CC macro-cxn (6.2), which in turn inherits from the maximally abstract CC macro-construction (6.1), with an intermediary construction that specifies the ‘cause before effect’ order of subclauses. Finally, note that (6.10) also inherits from various other more abstract meso-constructions that license the clauses in C1 and C2. Figure 6.6 thus demonstrates how it is possible to arrive at the most abstract CC macro-construction via a complex network, starting out with the micro-construction *The more you give, the more you get*. In the words of Goldberg, “it’s constructions all the way down” (2003: 223). Considering the networks illustrated in Figures

6.5 and 6.6, it becomes obvious that indeed, there is massive redundancy in the English CC constructional network, to revisit the quotes by Hornstein et al. (2005) and Traugott and Trousdale (2013) (see above).

However, what these network illustrations also demonstrate is that, to paraphrase a well-known playwright, there is method in the madness. Thus, what under an MGG-based analysis would invariably have to be described as ‘ugly’, ‘inelegant’, ‘profligate’, and ‘unnatural’ actually turns out to be truly “baroque” with “vastly rich detail” when examined under the CxG lens (Traugott and Trousdale 2013: 53), highlighting a major advantage of the Usage-based CxG approach: the ability to effortlessly accommodate cross-clausal associations that emerged as significant at various levels of abstractness in the constructional network, as well as clause order phenomena such as stacking and the ‘reverse’ CC’. But what about the features not discussed so far?

To begin with, let us turn to the hypotactic features, *that*-complementizers and subject-auxiliary inversion (SAI). As will be argued, synchronically and from a Usage-based CxG perspective it makes more sense to describe *that*-complementizers and SAI as construction-specific features⁹ that serve pragmatic function (as opposed to hypotactic features). They can thus be accommodated into the CC constructional network as separate constructions with a particular form and function. This follows from the general requirement that

[a]ny construction with unique idiosyncratic morphological, syntactic, lexical, semantic, pragmatic or discourse-functional properties must be represented as an independent node in the constructional network in order to capture a speaker’s knowledge of their language” (Croft and Cruse 2004: 263, emphasis JH)

Treating *that*-complementizers and SAI as pragmatic features can be justified based on two findings of the present study: (1) The PdE CC construction is highly paratactic (see also the discussion below) and (2) *that*-complementizers and SAI are *optional* features. Both of these observations suggest that *that*-complementizers and SAI are no longer required to mark a hypotactic relationship between C1 and C2 in English. Evidence for this comes from the low frequencies of *that*-complementizers and SAI in the corpus data and, in the case of *that*-complementizers, the clear dispreference in the psycholinguistic experiments, underscoring Hoffmann et al.’s claim that they are “no longer central properties of the English CC construction” (2020: 213). Thus, unlike in other languages (e.g. German, where e.g. V-final word order in C1 is *obligatory* and unambiguously marks the clause as subordinate), in English it is highly questionable whether these optional features can seriously be brought forward as evidence for hypotaxis. Rather, it appears that Goldberg’s Corollary A to her Principle of No Synonymy (cf. the discussion in section 3.1.2) applies here: That is, when “two constructions are syntactically distinct and [semantically] synonymous”, they differ with regard to pragmatics (Goldberg 1995: 67). Thus Hoffmann et al. have hypothesized¹⁰ that as the CC became increasingly paratactic, *that*-complementizers and SAI (hypotactic features in earlier stages of English) have assumed a new function: “expressing focus” (2020: 212).

9 As noted in section 3.1.1, SAI is undoubtedly a construction-specific feature of the English CC: It is ungrammatical in declarative clauses: [*the more* [*will I*]_{SAI} *pay them.*]_{C2} → **Will I pay them more.*

10 Regarding *that*-complementizers, Hoffmann et al. (2020: 212) base this claim on Mantlik and Schmid’s (2018) study on the English N + BE + *that* construction (Mantlik and Schmid have suggested that the factor which “lies at the heart of the introduction of the zero variant” (i.e., the variant with no overt *that*-complementizer) of the English N + BE + *that* construction can be traced to “stylistic choice” (2018: 211)).

MACRO-CXN

$[[\delta\theta []_{\text{comparative phrase 1}} (\text{clause})]_{C1} + [(\delta\theta) []_{\text{comparative phrase 2}} (\text{clause})]_{C2}]$
CC macro-cxn (6.1)

CC cxn ('cause before effect')

$[[\delta\theta []_{\text{comparative phrase 1}} (\text{clause})]_{C1} [\delta\theta []_{\text{comparative phrase 2}} (\text{clause})]_{C2}]$
BI-CLAUSAL CC macro-cxn (6.2)

MESO-CXN

$[[\delta\theta []_{\text{AdvP1}} (\text{clause})]_{C1} [\delta\theta []_{\text{AdvP2}} (\text{clause})]_{C2}]$
ADVP_{C1} × ADVP_{C1} meso-cxn (6.7)

$[[\delta\theta []_{\text{comparative phrase 1}} \text{clause}]_{C1} [\delta\theta []_{\text{comparative phrase 2}} \text{clause}]_{C2}]$
FULL CLAUSE_{C1} × FULL CLAUSE_{C2} meso-cxn (6.10)

[SBJ V-AGR]

[VERB PHRASE]

[NOUN PHRASE]

$[[\delta\theta []_{\text{AdvP1}} \text{clause}]_{C1} [\delta\theta []_{\text{AdvP2}} \text{clause}]_{C2}]$
ADVP_{C1}-FULL CLAUSE_{C1} × ADVP_{C2}-FULL CLAUSE_{C2} meso-cxn (6.15)

$[[\delta\theta [m\ddot{o}:r]_{\text{AdvP1}} \text{clause}]_{C1} [\delta\theta [m\ddot{o}:r]_{\text{AdvP2}} \text{clause}]_{C2}]$
more_{AdvP_C1} + FULL CLAUSE_{C1} × more_{AdvP_C2} + FULL CLAUSE_{C2} meso-cxn (6.21)

MICRO-CXN

Output: *The more you give, the more you get.*
 (GLOWBE-AU wlp_au_kso/wlp_au_g04 general ##794675 Line: 311)

Figure 6.6 Multiple inheritance network showing the meso-constructions behind 'The more you give, the more you get.'

This is particularly applicable to SAI, as discussed in section 3.2.1 in the context of the reverse C2C1 order: The “principle of emphasis” (Firbas 1992) holds that when the word order is changed “in a way that strikes the recipient as more or less out of the ordinary [it] fulfills an additional communicative purpose” (1992: 118). However, Hoffmann et al. do concede that theirs is a “bold claim” that will have to be confirmed by empirical data (2020: 212). Ideally, their hypothesis would be tested using psycholinguistic experiments, but unfortunately the limited scope of the present study did not permit carrying out further experiments. Resolving this question will therefore have to be left to future research projects. For now, it will be assumed that *that*-complementizers and SAI do indeed serve the pragmatic function of focus¹¹ in the PdE CC construction. This gives rise to the corresponding THAT-COMPLEMENTIZER (6.25) and SUBJECT-AUXILIARY INVERSION (6.26) meso-constructions:

(6.25) THAT-COMPLEMENTIZER CC meso-cxn	
FORM:	$[[\delta\theta []_{\text{comparative phrase 1}} \delta\text{æt} [\text{clause}_1]_{\text{FOCUS}}]_{\text{C1}} [\delta\theta []_{\text{comparative phrase 2}} (\text{clause}_2)]_{\text{C2}}]_{\text{CC}}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause_1] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause_2 /with respect to a contextually retrievable clause] _{dependent variable} in a monotonic way’
(6.26) SUBJECT-AUXILIARY-INVERSION CC meso-cxn	
FORM:	$[[\delta\theta []_{\text{comparative phrase 1}} (\text{clause}_1)]_{\text{C1}} [\delta\theta []_{\text{comparative phrase 2}} [[V_{\text{aux}}] [\text{SBJ}]_{\text{FOCUS}} [V_{\text{main}}]]_{\text{C2}}]_{\text{clause}_2}]_{\text{CC}}$
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to clause_1 /with respect to a contextually retrievable clause] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to clause_2] _{dependent variable} in a monotonic way’

On a final note regarding *that*-complementizers and SAI, it is also possible that their function is not focus but stylistic: Recall that the corpus study revealed that *that*-complementizers were preferred in the spoken register, while SAI turned out to be more typical of written academic texts. While it is true that traditionally, variation in constituent order has been assumed to lead to differences in pragmatic function, evidence from other

11 Another possibility is that *that*-complementizers and SAI do not have any function: Laporte et al., in a study on subject extraposition, have observed that “the Principle of No Synonymy largely breaks down at low levels of formal description”, concluding that “distinct pairs of form and function, i.e. constructions, can be found at different levels of abstraction, but that these constructions also subsume formal realization patterns that do not encode a difference in function” (2021: 230). However, as Laporte has noted, the “question of constructions without difference in meaning/function is [...] really tricky, because it’s hard to prove a negative, that is, that there is indeed no difference in meaning/function between two templates” (p.c. in January 2022).

languages has shown a “particularly striking *stylistic variation* in word order” (Currie 2000: 203, emphasis JH). While this does not have any serious implications for the existence of the meso-constructions that license the use of *that*-complementizers (6.25) and SAI (6.26), their meaning sides would have to be modified accordingly to accommodate stylistic effects. Again, however, the limited scope of the present study did not allow for any further investigation in this regard, so that future research will have to resolve these questions.

Having discussed the hypotactic construction-specific features *that*-complementizers and SAI and their role in the meso-constructional network, it is now time to turn to paratactic features. The most striking of these is the pronounced preference for symmetry in form and the concomitant strong dispreference of asymmetric and hypotactic features. Recall that *that*-complementizers and subject-auxiliary inversion turned out to be highly infrequent in the corpus data: The former made up no more than 2% of tokens in any of the (sub)-corpora while the latter was the least preferred alternative for auxiliary as well as main verb BE use when compared to deletion and non-inversion. Furthermore, the psycholinguistic experiments revealed that across varieties, participants clearly preferred those test items that featured no *that*-complementizers, while asymmetric encoding using *as*_{C1} and *then*_{C2} was strongly dispreferred. Similarly, regarding the experiments testing object pronoun extraction, participants consistently¹² rated those test items better that featured symmetric form. i.e., with both pronouns retained or with ATB extraction the latter of which has been brought forward as proof of parataxis in the English CC construction (cf. Culicover and Jackendoff 1999).

More importantly, though, the cross-clausal associations unearthed by HCFA and covarying-collexeme analyses were almost exclusively symmetric¹³. This concerns filler types as well as deletion phenomena. The latter, which the corpus study showed to be strongly preferred over SAI, are particularly interesting in this regard: As noted in section 3.1.2, verb deletion means that first, C2 can no longer be marked as main clause using SAI and second, speakers have another possibility of realizing the CC as a symmetric structure by deleting/truncating in C1. All of these results strongly support previous findings by Hoffmann et al., who in their BNC data found “clear evidence that supports our claim that the central properties of Modern English CCs are paratactic, not hypotactic” (2020: 213).

Therefore, while MGG-based analyses have concentrated on hypotactic features (e.g. Borsley 2003, 2004 and den Dikken 2005) in an attempt to produce evidence for hypotaxis in the English CC construction, the results of the corpus study and psycholinguistic experiments suggest that it makes more sense to focus on paratactic features. These manifest themselves as symmetry in form between C1 and C2 and could be found in all components of the English CC construction: In addition to the symmetric cross-clausal associations and the pronounced dispreference of hypotactic features discussed above, it is notable that in English CCs the invariant clause-initial elements *the*_{C1} ... *the*_{C2} ... and the obligatory word order in C1 and C2¹⁴ are identical¹⁵. Finally, as discussed in section 4.3.1.2, the entrenchment of the meso-constructional template featuring *more*_{C1} × *more*_{C2} also shows a tendency towards formal

12 With the exception of BSAfE, cf. section 5.3.2.3.

13 The exception being the deletion pattern BE-DELETED MV_{C1} × BE-RETAINED MV_{C2} that turned out to be significant with a collostructional strength of 2.244** in GloWbE stage V (cf. section 4.3.3.2).

14 With the exception of SAI, which, however, turned out to be infrequent in the corpus data.

15 Unlike e.g. Slovak, which features different clause-initial elements (*čím*_{C1} ... *tým*_{C2} ...) or German, where C1 as a subordinate clause has an obligatory V-final word order.

symmetry as it is used to replace common synthetic comparative forms (e.g. *healthier*) with uncommon non-periphrastic comparative forms (e.g. *more healthy*).

Of course, the question remains how to account for this extreme degree of parataxis with the Usage-based CxG approach. The key concept here is iconicity, that is, the “(partial) motivation of a construction’s form by its meaning” (Hoffmann 2019: 12). In this context, it has been argued in section 1.2 that the principle of iconicity predicts a competition between symmetric and asymmetric form in CCs, which encode both symmetric (parallel change over time) and asymmetric (cause-effect) semantics. In the words of Hoffmann (2019: 39, emphasis JH), the principle of iconicity

predicts two possible ways in which languages can encode the comparative correlative meaning syntactically: one possibility is that the *asymmetric conditional relationship is stressed*, which leads to a syntactic hypotactic structure in which C1 functions as a subordinate clause to the main clause C2. Alternatively, languages can also *encode the symmetrical clause-internal semantics* by a parallel syntactic structure in C1 and C2 (with a fully paratactic construction as the most extreme form of expression).

As has been touched upon earlier, the fact that the English CC construction exhibits a high degree of parataxis at the expense of hypotaxis suggests that typologically, it is a language located very close to the parataxis pole of the parataxis-hypotaxis continuum: The asymmetric formal features – *that*-complementizers and SAI – are clearly dispreferred, whereas every other formal aspect of the CC construction is strongly paratactic.

In summary, this section has addressed the first two research questions (cf. section 1.5) and confirmed the corresponding hypotheses, demonstrating that the best way to describe the English CC is by means of a meso-constructional network that captures the numerous redundancies that manifested themselves as cross-clausal associations of various degrees of abstractness in the corpus data. The network is also able to accommodate further features that under MGG-based approaches had to be excluded (the CC’ construction) or banned (stacking). In addition, it was shown that with the meso-constructional network, it is possible to account for hypotactic features with separate THAT-COMPLEMENTIZER and SUBJECT-AUXILIARY INVERSION meso-constructions. Finally, the Usage-based CxG approach has also been shown to be able to deal with the degrees of hypotaxis/parataxis that particularly emerged from the psycholinguistic experiments. Thus, instead of a simple hypotactic-paratactic dichotomy that is demanded by an MGG-based analysis, the evidence suggests that there is a typological continuum with a paratactic and a hypotactic pole.

Concerning the second research question and the corresponding hypothesis, it has been demonstrated that across all investigated varieties and particularly in the standard varieties BrE and AmE there is a pronounced tendency towards symmetry that can be explained with domain-general cognitive processes (cf. Goldberg’s Tenet #5 (2003: 219)), more specifically, the principle of iconicity. This principle predicts a competition between symmetric and asymmetric form in CCs. The results of the corpus study and the psycholinguistic experiments clearly show that in PdE this competition has been decided in favor of symmetry, to the effect that at this stage, the CC construction is overwhelmingly paratactic.

6.4 Putting the Dynamic Model to the test: The CC across World Englishes

Having discussed general trends across varieties at length, it is now time to turn to variety-specific differences and address research questions 3-5 (cf. section 1.5). In this section it will be shown that with one exception, the hypotheses outlined in section 1.5 could be confirmed:

- Variety-specific effects can be explained with the specific input situation that is characteristic of each PCE;
- where stage-specific effects emerged, they generally correlate with Dynamic Model (DM) stages, confirming the model's predictive power;
- evidence from the corpus study and the psycholinguistic experiments strongly supports Kortmann's (2014) claim of a typological L1–L2 continuum ranging from 'preservers' to 'deleters', suggesting that "geography is clearly only of secondary importance to variety type" (Kortmann 2014: 166), *contra* Mesthrie's (2006, 2008a; 2012) preservers and deleters hypothesis.

However, it was not possible to detect a particular tendency in stage III varieties toward *structural innovation*, so that Schneider's claim of such innovation in stage III "at the interface between lexis and grammar" (2007: 83) could not be confirmed in the case of the CC construction. Thus, while a correlation between DM stages and linguistic features could be determined, proving the predictive power of the DM, it turned out that the trend in stage III varieties was toward *conserving* and not innovating. As discussed in the following, there are two plausible explanations for this effect: First, despite the fact that "meso-constructions are actually the target of structural innovations during the nativization stage [i.e. stage III]" (Hoffmann 2019: 197), it appears that the influence of general processing constraints is considerably more powerful, "lead[ing] to the entrenchment of similar structures in all types of varieties" (Hoffmann 2019: 197). Second, a phenomenon known as "constructional koinéization" (Hoffmann 2019: 193) seems to have asserted itself in stage III varieties, casting off infrequent features that might have the potential of innovation. This effect, as will be argued, has to do with the fact that the semantics expressed by the CC construction are more universal cross-linguistically than e.g. those of the *way*-construction, which is very specific to English. Following the domain-general principle of iconicity (Bybee 2012: 529), many languages, including sub- and adstrates that have influence on PCEs, feature CCs that are similar in form to the English CC, which in turn hinders the emergence of innovative features.

Before proceeding, it has to be pointed out once more that the differences between varieties turned out to be few in number and inconspicuous in nature when compared to phonological variation in PCEs. This is because, as was discussed in more detail in chapter 5, syntactic variation across PCEs is generally less pronounced than phonological variation because, put succinctly, "accent divides and grammar unites" (Mair 2008: 156). This, however, was to be expected: As Traugott and Trousdale note in the context of constructionalization (i.e., the emergence of new constructions) and constructional changes, "no construction is entirely new" because "[t]here will always be a link at a minimum to a feature of some node" (2013: 58). That is, morphosyntactic innovation can be expected to be only minuscule in quantity and quality¹⁶.

16 With the exception of lexical borrowing, as noted by Traugott and Trousdale (2013: 58).

It is therefore unsurprising that the corpus study and the psycholinguistic experiments revealed neither large-scale nor particularly striking variety- or stage-specific effects. Recall, for example, that the investigation of periphrastic comparative forms in GloWbE turned up no DM stage-specific qualitative meso-constructional innovations. Similarly, the mixed-effects models that were used to analyze the experimental results revealed hardly any variety-specific effects. In fact, only in the *that*-complementizer experiment did the fixed effect VARIETY¹⁷ turn out to be significant, and significant interactions could only be found in two cases: THAT_C1:VARIETY (*that*-complementizer experiment) and THEN_C2:VARIETY (asymmetric encoding experiment).

The great degree of similarity between varieties and DM stages is perhaps best appreciated by taking a look at the meso-constructional networks of stages V (Figure 6.7), IV (Figure 6.8), III (Figure 6.9) and II (Figure 6.10). These figures, illustrating the cross-clausal associations that were determined in the corresponding GloWbE sub-corpora, reveal very little differences¹⁸ to Figure 6.5, which visualizes the AmE and BrE meso-constructional CC network. In fact, only one meso-construction¹⁹ emerged (in stages IV and V) that was *not* found in the standard varieties: BE-DELETED MV_{C1} × BE-RETAINED MV_{C2} (6.27). Thus, with one exception no qualitative meso-constructional innovations at the lower DM stages could be found.

(6.27) BE-DELETED MV_{C1} × BE-RETAINED MV_{C2} meso-cxn	
FORM:	[ðə [] _{comparative phrase 1} NP ₁] _{C1} [ðə [] _{comparative phrase 2} BE NP ₂] _{C2}] _{CC}
MEANING:	‘[As the degree of comparative phrase 1 increases/decreases with respect to NP ₁] _{independent variable} → [so the degree of comparative phrase 2 increases/decreases with respect to NP ₂] _{dependent variable} in a monotonic way’

When addressing the differences between varieties, it is therefore necessary to turn away from meso-constructional networks and focus on the results of the various statistical analyses (e.g. covarying-collexeme analysis, HCFA, LNRE and mixed-effects modeling) that explicitly tested for variety- and DM stage-specific effects.

The first construction-specific feature to be discussed in this context are *that*-complementizers in C1. The corpus study revealed that the use of this low-frequency feature is mostly restricted to stage V varieties: A covarying-collexeme analysis showed a strong repulsion of C1 *that*-complementizers for DM stage III and likewise, a strong attraction of

17 Despite not being significant ($p > 0.05$), the fixed effect VARIETY was retained in the mixed-effects model for the asymmetric encoding experiment because it was part of the significant interaction THEN_C2:VARIETY (principle of marginality, cf. section 2.1.2.1).

18 The fact that some of the networks in Figures 6.7-6.10 have fewer nodes (i.e., meso-constructions) cannot be attributed to variety-specific effects, but rather to the size of the sub-corpora: Recall that, as discussed in section 2.1.1.2, covarying-collexeme analysis “will yield a greater number of significant results as sample size increases” (Hoffmann 2019: 176).

19 Incidentally, this was also the only non-symmetric cross-clausal association found in the corpus data, further underscoring the remarkable degree of parataxis in English CCs.

CCs with *no* C1 *that*-complementizers to DM stage III. Thus, it was possible to confirm earlier small-scale investigations that found “a slight dispreference for C1s without a *that*-complementizer in Stage V varieties” and concluded that “[s]tage IV and III L2 varieties exhibit an even stronger paratactic relationship between C1 and C2” than stage V varieties (Hoffmann 2019: 210). This finding was corroborated by the psycholinguistic experiments, which revealed the interaction `THAT_C1:VARIETY` to be significant. In this context it was shown that *that*-complementizers were more entrenched in stage V varieties (i.e., AmE and WSAfE) and that there was a trend towards speakers of higher-stage varieties being less sensitive to the presence of a *that*-complementizer in C1. In simpler terms, the evidence showed that the higher the DM stage was, the more entrenched *that*-complementizers in C1 were.

To explain these results, it is necessary to consider the input situation that speakers of L2 varieties (i.e., stages IV and III) were exposed to as their PCE developed. Recall that the DM as a sociolinguistic model posits that the evolution of PCEs is characterized by the interaction of an STL and one or several IDG strands. As a new PCE emerges, these strands become increasingly intertwined, thus changing the linguistic input situation that its speakers are exposed to: While in the early stages, there is only restricted contact between the STL and IDG strands, with little linguistic effects save for toponymic borrowing (stage I) and cultural lexical borrowing (stage II), in later stages contact and linguistic exchange between the strands intensify, resulting in increasingly complex linguistic developments that culminate in “large-scale linguistic effects” (Brunner and Hoffmann 2020: 3). In this context, Hoffmann notes that the “central phase during which [...] linguistic transformations take place” (Hoffmann 2014: 11) is stage III, but stage IV is also of interest in this respect. This is when PCEs stabilize (hence the designation ‘Endonormative Stabilization’) and innovative morphosyntactic patterns are consolidated. This includes a process that has been referred to as “constructional koinéization” (Hoffmann 2019: 193):

[D]ialect contact involves the interaction of speakers with similar, but nevertheless (slightly) different constructional taxonomic networks. As expected in these situations, infrequent constructions of only a small number of speakers will often be lost, while form-meaning mappings that can be understood by a large number of speakers will become more strongly entrenched.

As highly infrequent features, it is thus likely that *that*-complementizers fell prey to constructional koinéization early on in the development of L2 varieties. As a result, the following generations of speakers were exposed to even fewer instances of *that*-complementizers, leading to input situations where these construction-specific features were less preferred and eventually dispreferred altogether. This is confirmed by the evidence presented in chapters 4 and 5: Stage III varieties exhibited a statistically significant repulsion of *that*-complementizers in the corpus data and the psycholinguistic experiments revealed a general trend towards lower acceptability of *that*-complementizers in stages III and IV. Note that in the context of *that*-complementizers constructional koinéization also offers a good explanation for Kortmann’s L1-L2 continuum (2014) that ranges from L2 (i.e., stage III and IV) varieties as “deleters” to L1 (i.e., stage V) varieties as “preservers” (2014: 176).

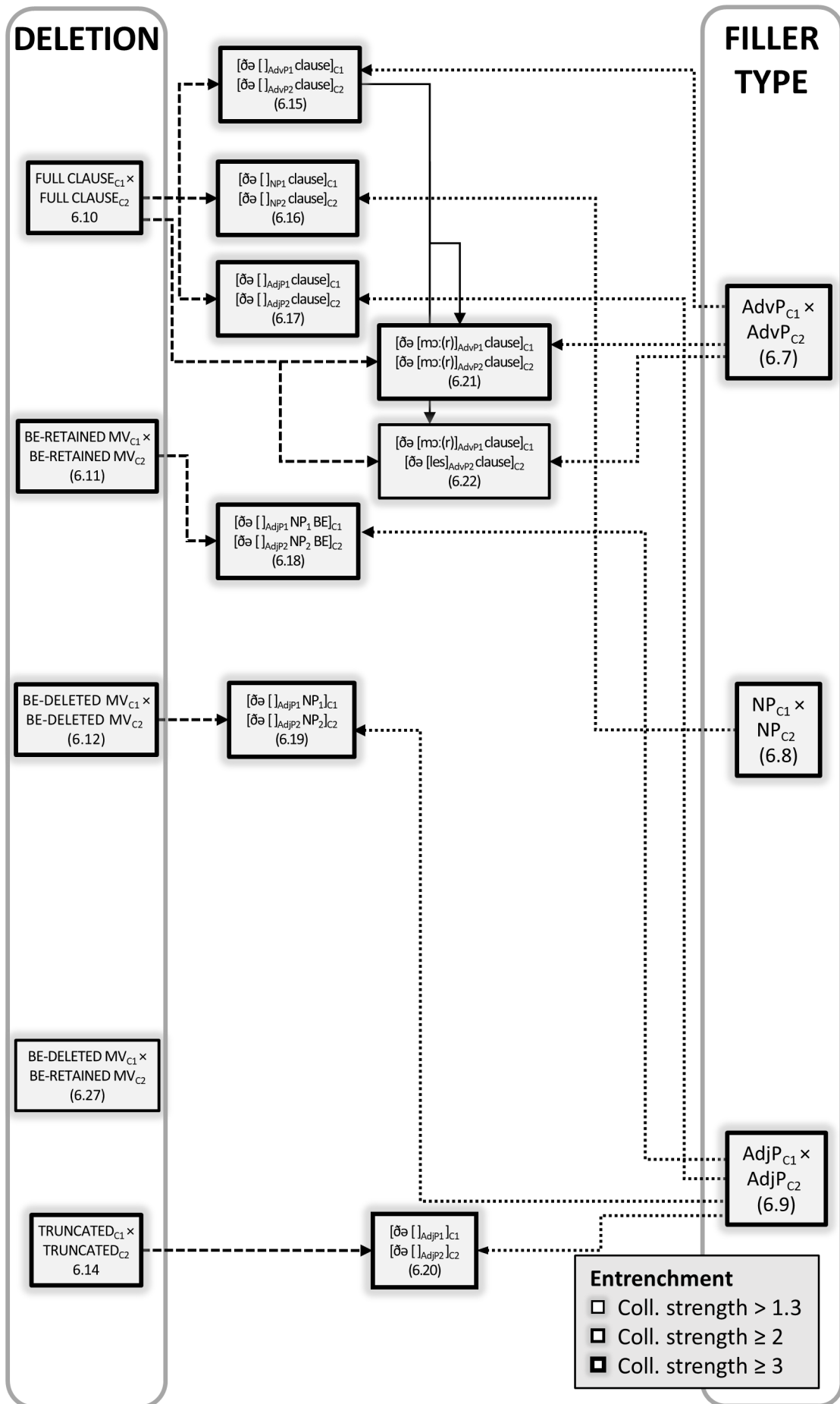


Figure 6.7 DM Stage V CC network (based on data from GloWbE)

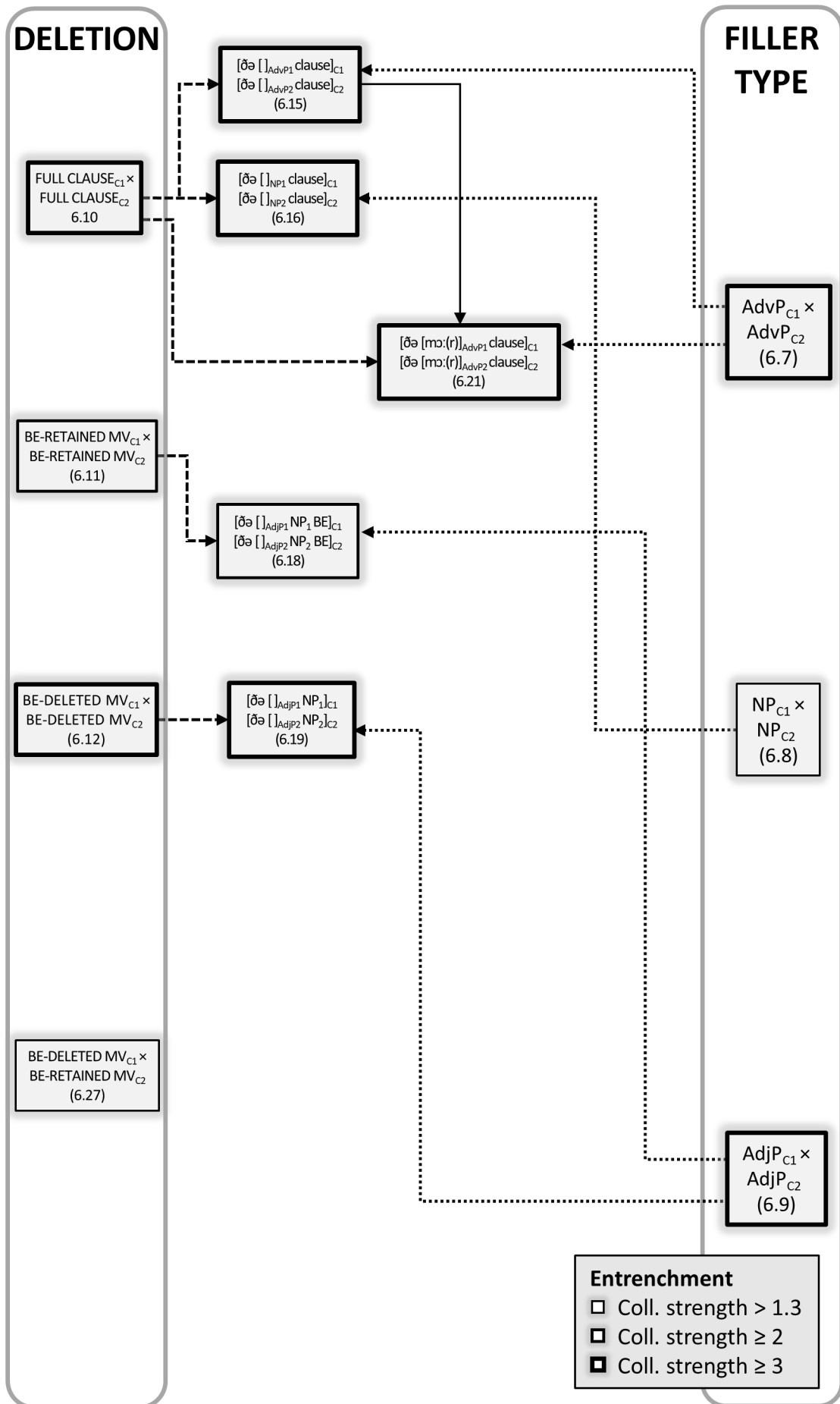


Figure 6.8 DM Stage IV CC network (based on data from GloWbE)

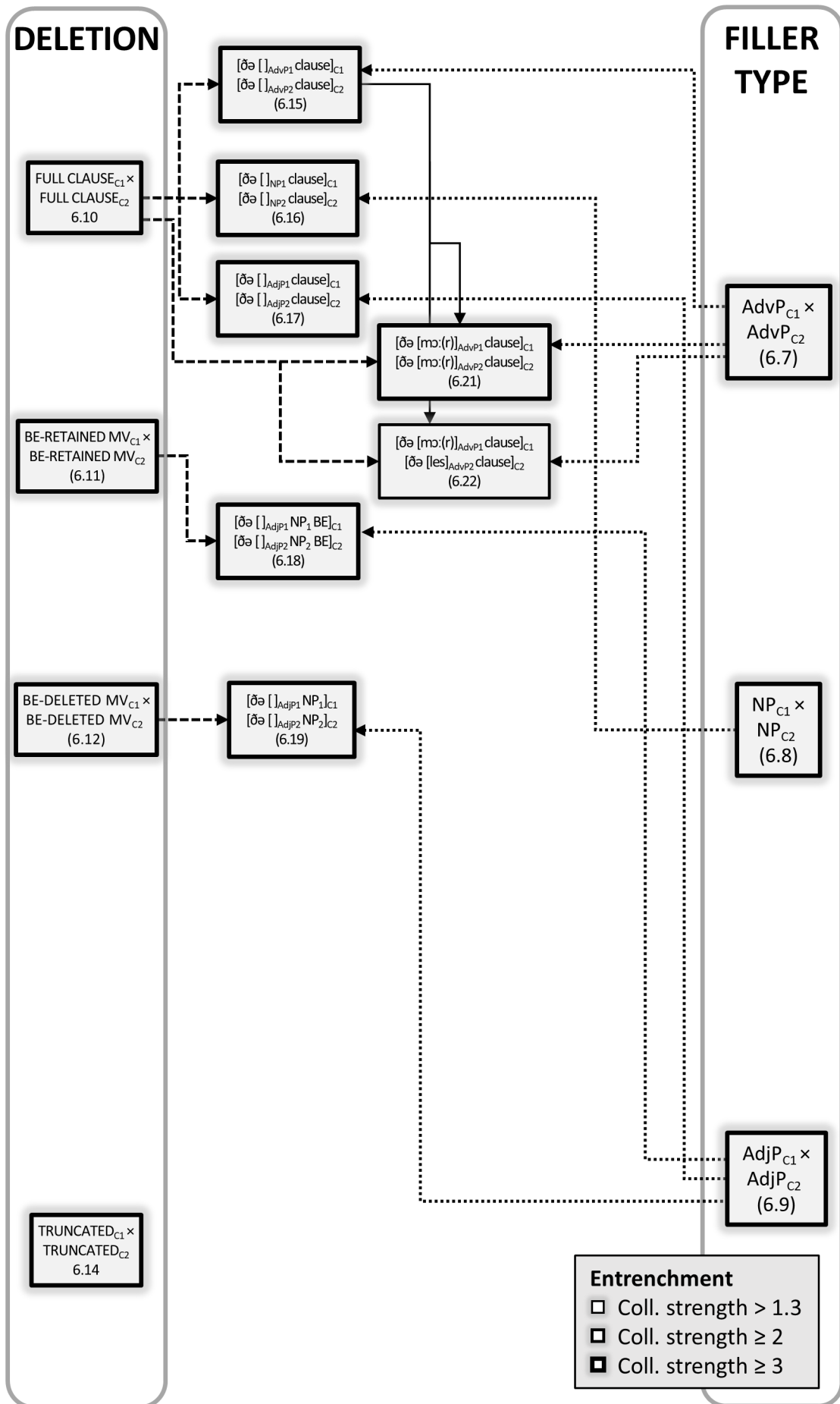


Figure 6.9 DM Stage III CC network (based on data from GloWbE)

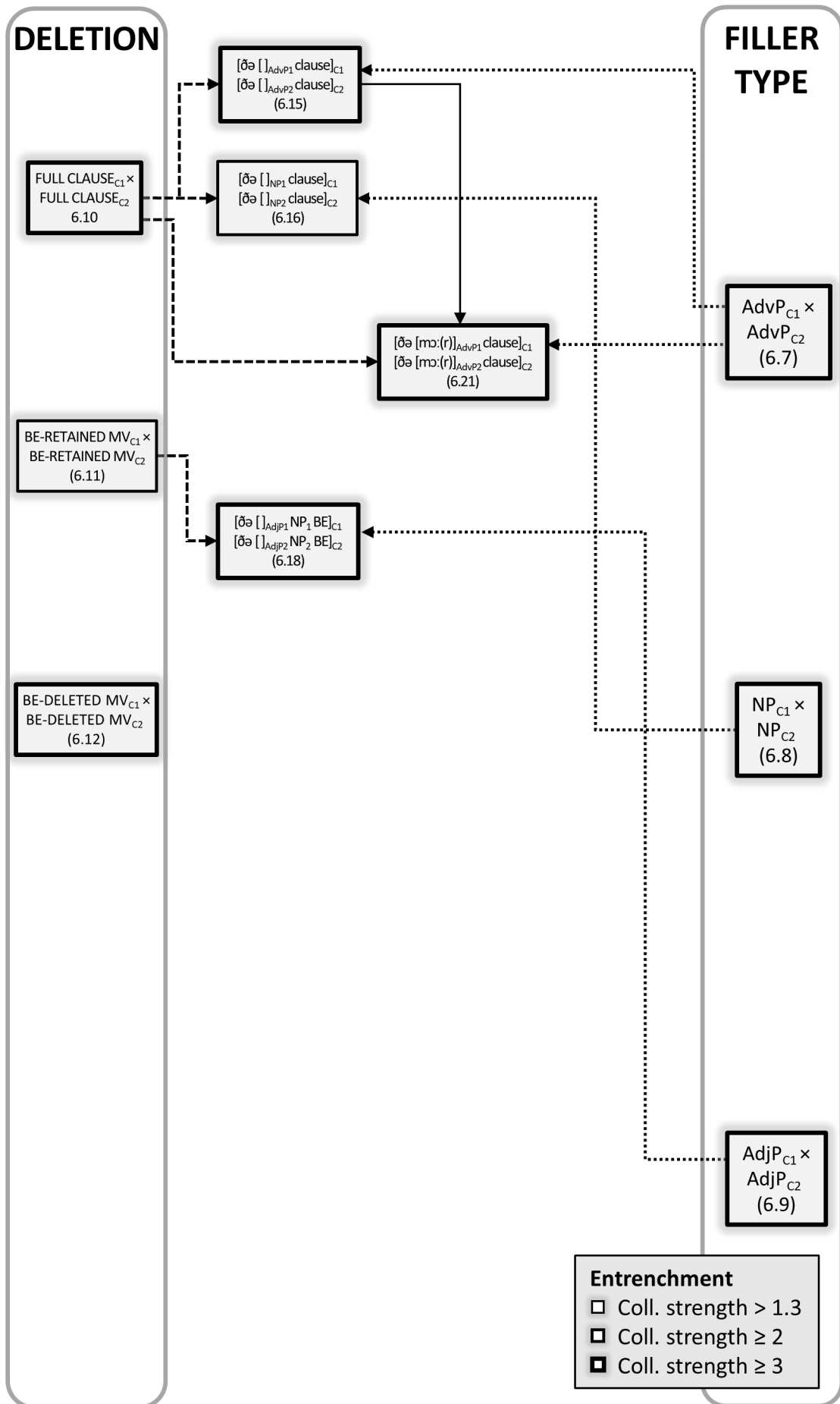


Figure 6.10 DM Stage II CC network (based on data from GloWbE)

Besides effects that affect stage III PCEs in general such as constructional koinéization (see above), the particular input situations of varieties must also be taken into account. This concerns the IDG strands that contributed in ‘shaping’ individual PCEs. Unfortunately, the scope of this study does not permit a detailed analysis of all of the sub- and adstrates of each of the 20 varieties that were investigated, so that individual, particularly illustrative cases will be singled out in the following. Regarding C1 *that*-complementizers, it is certainly SingE that warrants a more detailed discussion. Recall that in the SingE data set (cf. section 5.1.4), C1 *that*-complementizers were rated with a z-score of only 0.146, which was well below the grammatical filler mean (for comparison, in the AmE data set the z-score was 0.647). With the exception of KenE (z-score: -0.013), this was the lowest rating of all varieties. The differences in z-score ratings between items with *that*-complementizers in C1 and no *that*-complementizers in C1 (cf. section 5.1.5) were even more telling: In essence, the aim was to show the degree to which participants preferred test items with no *that*-complementizers over those with *that*-complementizers. Figure 5.18 from chapter 5, repeated here as Figure 6.11, clearly shows that SingE stands out in this regard with a z-score difference of 0.588, the largest such difference in rating across all varieties. For comparison, the corresponding values in AmE were 0.094 and in CSAfE, 0.319.

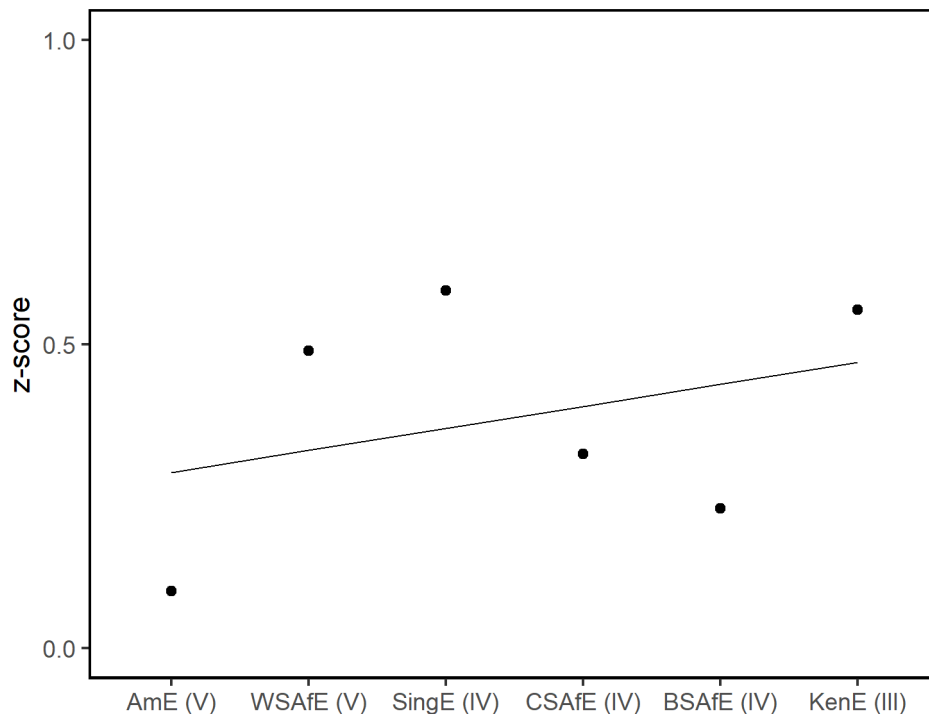


Figure 6.11 Magnitude estimation z-scores of *THAT* in C1 subtracted from z-score ratings of *NO THAT* in C1 across varieties

This suggests that SingE speakers are particularly sensitive to the presence of *that*-complementizers. Of course, this effect can be partly explained with the fact that SingE is a stage IV L2 variety that emerged against the background of “extreme multilingualism, both individual and societal” (Gupta 1994: 1), an ideal condition for extensive constructional

koinéization (see discussion above). However, this is not enough to explain why the effect was considerably more pronounced in SingE than in the other L2 varieties CSAfE and BSAfE, and slightly more so compared to KenE²⁰.

Thus, it is necessary to turn to the particular input situation that has shaped SingE, in other words, the ad- and substrate languages have influenced the SingE constructional network. As Gupta notes, “SCE is a contact variety which arose in a situation of extreme multilingualism and has many traces in it of influence from other languages” (1994: 6), so that here, it is impossible to provide a comprehensive diachronic and synchronic overview of the complex linguistic situation in Singapore. Rather, the focus will be on “Chinese majority” (Gupta 1994: 2), which, based on speaker numbers can be assumed to have had the most influence on SingE. Of course, the term ‘Chinese’ does not do justice to the great variety of Chinese dialects that are spoken in Singapore. Gupta writes of “many ‘dialect groups’ including Hokkien, Teochew, Cantonese, and Hainanese” (1994: 1) that resulted in a “proliferation of varieties of Chinese” (1994: 3). While in the 1990s, “most Chinese families used Southern varieties of Chinese at home, not Mandarin” (Gupta 1994: 3) and thus, “some of [SingE’s] features represent the direct influence of, mostly, Southern varieties of Chinese” (Gupta 1994: 7), it appears that the situation has since changed quite drastically, as is evident from Figure 6.12, which shows the development of the dominant home language of Chinese Singaporean students upon entering primary school from 1980 to 2009.

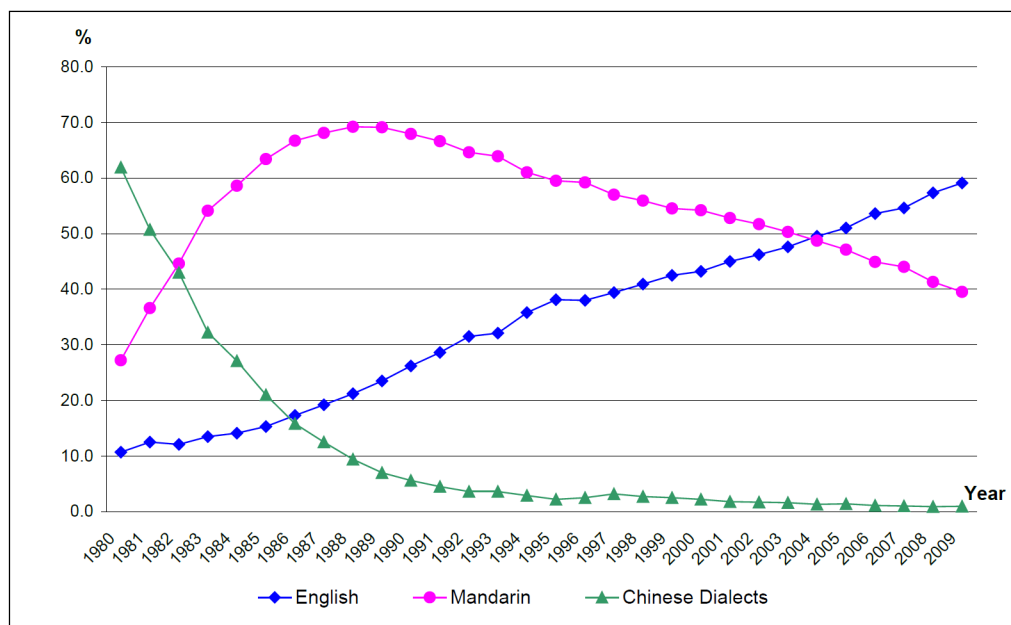


Figure 6.12 Dominant Home Language of Chinese Primary-1 Students (Singapore Ministry of Education 2010)

20 An investigation of the sub- and adstrates that characterize KenE was not possible regarding the CC because the construction not discussed in any of the consulted grammars, e.g. for Gikūyū (Mugane 1997), Swahili (Mpiranya 2015) and Kĩnkamba (Ndukū Kĩoko 2019). Also, unlike for Mandarin Chinese (see below), to the author’s knowledge there is no literature on the comparative correlative construction in Swahili.

Accordingly, in a recent report by the Ministry of Education of Singapore (2010), it was noted that

[t]he proportion of Chinese families in Singapore who speak dialects at home has dropped significantly in the past 30 years. It fell below 10% in 1988 and continued on a downward trend. Since 2001, less than 2% of Chinese students in each cohort have come from dialect-speaking homes.

Rather, it appears that apart from English, which had seen a steady increase to almost 60% by 2010, Mandarin Chinese is now the dominant language, with a share of approximately 40% (Singapore Ministry of Education 2010). Considering that the 31 university students who participated in the psycholinguistic experiments were no older than 24 (i.e., they entered the education system well *after* the decline of other Chinese varieties), it thus makes sense to concentrate on Mandarin in the following – while keeping in mind, of course, that there are many more sub- and adstrates that could have influenced the CC construction in SingE.

Returning to *that*-complementizers and their particularly pronounced dispreference in SingE, it is therefore insightful to take a closer look at the CC's counterpart in Mandarin Chinese. (6.28) and (6.29), taken from Zhan and Traugott (2020), are two examples that illustrate the basic form of the Mandarin Chinese CC construction:

- (6.28) 小丽 [越 长] [越 美]
 Xiǎoli yuè zhǎng yuè měi
 Xiaoli more grow more beautiful
 'The more Xiaoli grows, the more beautiful she is.' (Zhan and Traugott 2020: 84)
- (6.29) 小明 [越 吃] [越 胖]
 Xiǎomíng yuè chī yuè pàng
 Xiǎomíng more eat more fat
 'The more Xiaoming eats, the fatter he gets.' (Zhan and Traugott 2020: 93)

Note that the Mandarin Chinese CC construction is very similar to its English counterpart in that it is highly paratactic²¹, using the symmetric template [*yuè*... *yuè*...] (as noted by Zhan and Traugott 2020: 83). Interestingly, while *yuè* is commonly glossed as *more* in example sentences (this includes Zhan and Traugott's examples above), it is actually "a transitive verb meaning 'to exceed, to surpass'" that "never occurs in a 'plain comparative', only in complex, correlative constructions" (Zhan and Traugott 2020: 93). In other words, *yuè* is a fixed, construction-specific element of the Mandarin Chinese CC construction, much like the clause-initial elements of the English CC construction (cf. discussion in section 1.2).

Now, assuming that "in bilingual Mandarin [Chinese] and PCE speaking individuals, the constructional networks of the two languages can interact [such that] semantically similar constructions are [...] activated in a parallel fashion" (Hoffmann 2019: 229-30), it is conceivable that the extreme degree of parataxis in the Mandarin Chinese CC construction is transferred to its semantic equivalent in English when used by bilingual Singaporean speakers, who therefore shy away from hypotactic features even more than speakers of the other varieties (cf. Figure 6.11 above). This was also predicted by Hoffmann, who noted that "[t]he degree to which [...] asymmetric new construction templates arise will [...] depend on

21 Apart from the optional element *jiù* that can be used to link C1 and C2 (cf. Hoffmann 2019: 229, who refers to Lin 2007), the author is not aware of any asymmetric formal features of the Mandarin Chinese CC construction.

potential L1 transfer effects” (2019: 25). Clearly, in the case of SingE it is the high degree of symmetry in the Chinese CC that has resulted in the striking preference of symmetric form among speakers of SingE.

Further DM stage-specific effects could be determined in the asymmetric encoding experiment (cf. section 5.2.5), revealing a trend that could be summarized as ‘the lower the DM stage, the less sensitivity to non-standard CCs’ (i.e., those that featured clause-initial *as*_{C1} and *then*_{C2}). Put differently, the higher the DM stage was, the higher the preference for test items without *then*_{C2} and thus, the prototypical CC form. This was illustrated using a graph in which the magnitude estimation z-scores of *then*_{C2} were subtracted from those of no *then*_{C2}, repeated here as Figure 6.13.

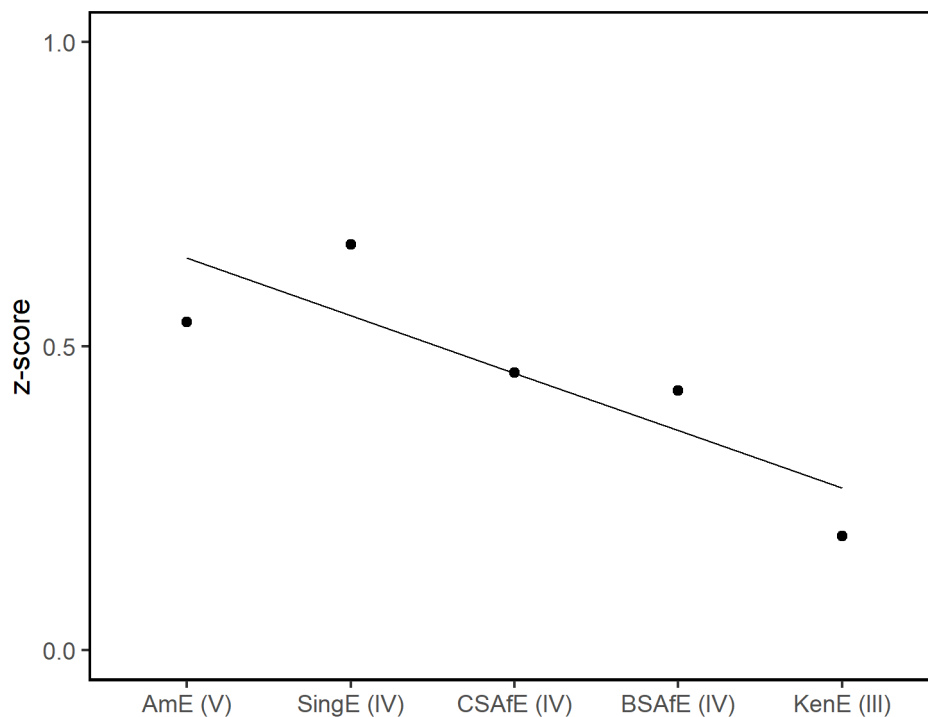


Figure 6.13 Magnitude estimation z-scores of *THEN* in C2 subtracted from z-score ratings of *NO THEN* in C2 across varieties

In particular, the stage III variety KenE stood out in this respect, revealing a distinct preference for asymmetrically encoded structures with extra lexical material compared to the other varieties. In fact, this was the only case where evidence could be found for innovation at the lexis-syntax interface in stage III, in support of the Dynamic Model (although, as noted in section 5.2.4, the BSAfE data did not conform to this claim). Unfortunately, as noted above (cf. Footnote 20), it was not possible to find any literature on the CC construction in any of the sub- and adstrates that influence KenE, so that it was difficult to determine the exact nature of the specific input situation that speakers of KenE are exposed to. However, it is not unlikely that the peculiar results of the asymmetric encoding experiment for KenE can be traced, at least in part, to sub- and adstrate influence: “distinctively Kenyan forms [...] embedded in a wider framework of East African features” (Schneider 2007: 195, referring to

Hancock and Angogo 1982: 312-318, emphasis JH) have been noted previously. Clearly, however, there is a gap in research here that must be addressed by future studies. Finally, it must be noted that despite the variety- and stage-specific effects discussed here, across all varieties and stages the best-rated items were clearly those that featured the prototypical CC, i.e. without *as*_{C1} and *then*_{C2}.

There also turned out to be DM stage-specific effects regarding order types. In addition to a slight trend towards higher C1C2:C1C2C3 ratios in the lower DM stages, a covarying-collexeme analysis of the GloWbE corpus data (see section 4.2.2.3) revealed that while the higher stages exhibited attraction to non-standard CCs such as C1C2C3 (stage IV) and ‘other stacked’²² (stage IV and GB), stages II and III showed strong attraction to the canonical C1C2 order. Additionally, stage III exhibited a strong repulsion of the ‘other stacked’ category. Based on these results, it was concluded that the C1C2 order is preferred in the lower stages, whereas the alternatives – C1C2C3, C3C2C1, and ‘other’ variations – are dispreferred by speakers of stage II and III varieties. Similar effects were determined regarding the non-iconic C2C1 order (i.e., the CC’ construction): The C1C2:C2C1 ratio was lower in the stage V varieties, so that it was concluded that in the lower DM stages, the iconic C1C2 order is more deeply entrenched at the expense of C2C1. As with *that*-complementizers, an explanation for this state of affairs may be found in constructional koinéization: Being considerably less frequent than the canonical C1C2 order, the other clause order phenomena were lost as speakers of various dialects and different L1 languages were forced to find common ground and agree on a “middle-of the road variety” (Hoffmann 2019: 193). Thus, in the case of the CC construction, it is the iconic C1C2 order that was in the middle of the road.

Turning to the productivity of the lexical filler slots in C1 and C2, a calculation of the ratio of significantly associated filler pairs, determined by means of covarying-collexeme analyses, versus C1C2 tokens revealed a slight trend that can be summarized as ‘the higher a DM stage, the more use of macro-constructions and less use of meso-constructions it makes’ (see section 4.4.1). Thus, the ratio was 2.85‰ for stage V (including GloWbE-GB), 4.18‰ for stage IV, and 4.23‰ for stage III. This appeared to confirm Hoffmann’s claim that higher-stage varieties “make greater use of more abstract macro-constructions (which are largely schematic, that is more productive)” (2014a: 174), and thus Brunner and Hoffmann’s “constructional productivity hypothesis” (2020: 15). These results, however, are to be taken with a grain of salt: As discussed in sections 2.1.1.2 and 4.4.1, covarying-collexeme analysis is a statistical test that will produce more significant results the larger a sample size is, and there were some considerable differences in size regarding the various DM stages. Thus, despite a general trend towards more filler pairs in the lower stages, in the smallest sample (DM stage II) only one significantly associated filler pair could be found, resulting in a low filler pair vs. C1C2 token ratio of just 3.21‰ that did not fit the pattern.

A more reliable way of measuring constructional productivity is LNRE modeling (see section 2.1.1.3). As discussed in section 4.4.2, while the productivity of the individual slots turned out to conform to the productivity hypothesis (with the exception of stage III), no substantial differences could be determined between stages when it came to lexical filler combinations (i.e., across C1 and C2). It could thus *not* be shown that there was any “stronger

22 As described in section 4.2.2, there was a great variety of stacked CCs. To facilitate the analysis and presentation of the data, they were grouped as follows: C1C2, C2C1, C1C2C3, C3C2C1, OTHER STACKED.

[...] tendency to select specific prototypical, or frequent, fillers in the constructional slots” at lower stages of the DM (Brunner and Hoffmann 2020: 1). This clearly contradicts Brunner and Hoffmann’s constructional productivity hypothesis, especially when taking into account the LNRE models of other constructions, such as the *way*-construction, where there were very clear effects (cf. Brunner and Hoffmann 2020: 15). In a final attempt to investigate the productivity of lexical fillers, the proportion of hapaxes to total lexical filler pairs was calculated, revealing a striking similarity between all stages emerging.

All of this evidence suggests that there were no variety- or stage-specific effects: The English CC construction (unlike the *way*-construction) is characterized by very similar productivity across all DM stages. It could thus not be confirmed that “New Englishes at lower stages of Schneider’s cycle have repeatedly been found to prefer frequent over infrequent forms” (Brunner and Hoffmann 2020: 6). Two possible explanations for this state of affairs were discussed in section 4.4.2: First, there is the fact that “lexis-related differences [between varieties] are topic-dependent and volatile” (Gries and Mukherjee 2010: 537) and second, there is a striking similarity in form of the CC’s counterparts in the various sub- and adstrates that shape the input to which speakers of PCES are exposed. Unlike highly idiomatic constructions that are specific to English, such as the *way*-construction, CCs are much more universal in nature and share many formal features across languages, a fact that has also been noted in the literature (as discussed in section 1.1.). Thus, speakers of L2 varieties should be much more confident when using the CC in English, which explains the similar degrees of lexical filler slot productivity across stages: They simply don’t have to rely so much on frequent and prototypical fillers. This could be confirmed when testing Brunner and Hoffmann’s “prototypical filler hypothesis”, which posits that “the less entrenched a variety is according to the Dynamic Model, the stronger the tendency will be to select prototypical, or frequent, fillers in constructional slots” (2020: 9). In fact, the results of a HCFA revealed a slight trend that contradicts the prototypical filler hypothesis, such that there were *less* significant lexical filler interactions in lower DM stages, and *more* in the higher stages.

All of the evidence discussed so far shows a clear and unambiguous trend: Differences between DM stages were few and far between (cf. meso-constructional networks), and where stage-specific effects could be determined (cf. *that*-complementizers), there was a pronounced tendency for lower-stage varieties to prefer the prototypical, iconic CC with the C1C2 order over any alternatives. In fact, only the asymmetric encoding experiment provided any tangible evidence for Schneider’s claim of innovation “at the interface between lexis and grammar” (Schneider 2007: 83), such that lower-stage varieties and in particular stage III varieties were less sensitive to the creative use of *then*_{C2} in CCs. While the central claim of the Dynamic Model – a correlation between evolutionary stages and linguistic characteristics – could therefore be confirmed, regarding the morphosyntax of the CC construction the evidence presented in this study clearly suggests that in this regard stage III varieties are conservative, not innovative. The most likely reason for this is constructional koinéization, compounded by domain-general processes, in particular the principle of iconicity.

On a final note, the evidence²³ gathered in the context of this study clearly supports Kortmann’s claim of a typological L1-L2 “continuum along the parameter ‘deletion vs. preservation’” (2014: 176) in World Englishes. As discussed in section 1.4, this continuum

23 With the exception of the asymmetric encoding experiment results, which provided evidence against the L1–L2 continuum claim, cf. section 5.2.5.

ranges from Pidgins and Creoles as extreme cases of ‘deleters’ via L2 varieties to L1 varieties, which Kortmann describes as “preservers” (2014: 176). The psycholinguistic experiments did not reveal any particular preference for preserving or even ‘undeleting’ *that*-complementizers in the African varieties CSAfE, BSAfE and KenE. Instead, it was shown that *that*-complementizers were rated the better the higher the DM stage. That is, the further along the evolutionary cycle (and thus closer to becoming an L1 variety), the more acceptable *that*-complementizers were in a variety. Therefore, the evidence at hand does not confirm a geographical dichotomy between African and South East Asian varieties, as claimed by Mesthrie and Bhatt (2008): For SingE, the data shows no statistically significant effects that would indicate a tendency towards ‘creatively’ deleting elements of the CC that would not be grammatically acceptable in Standard English varieties, and for African varieties, there was no indication of a statistically significantly higher acceptance of elements that are optional.

7 Conclusion

The only field in which we can find absolute certainty is religion.

David W. Anthony, *The Horse, the Wheel, and Language* (2007)

In the six chapters of this study, a tiny yet highly intriguing puzzle piece of the English language ‘map’ was thoroughly examined and described: the Comparative Correlative (CC) construction. Ample evidence from corpus data and psycholinguistic experiments was presented with the aim of resolving ongoing disputes in the literature and mapping out the English CC construction more exhaustively and more accurately than ever before, contributing to our knowledge of the English construct-i-con. To this end, more than 10,000 tokens from three of the largest corpora of English (COCA, BNC, GloWbE) and experimental data from almost 600 participants from four locations (Texas, South Africa, Singapore, and Kenya) were analyzed using advanced statistical methods. Building on the many introspective and corpus-based investigations of the CC construction that already exist, three major gaps in research that were identified in section 1.5 could be addressed: For the first time, evidence was used that came from very large corpora (i.e., consisting of several hundred million words), for the first time twenty varieties of English were investigated, and for the first time, findings from the corpus study were complemented with psycholinguistic experiments, underscoring the importance of corroborating corpus data with introspective data.

The evidence thus obtained clearly showed that the PdE English CC is best described as a highly paratactic construction, and that massive redundancy must be accounted for when describing it: A multitude of cross-clausal associations were determined using covarying-collexeme analysis, suggesting the existence of an elaborate network of interconnected meso-constructions. In chapter 6, it was argued that MGG-based approaches struggle with explaining such evidence because they strive to posit maximally abstract rules with as little redundancy as possible. A theoretical approach that is better suited to accommodate the findings of the present study can be found in Usage-based Construction Grammar, an approach that sees redundancy not as a hindrance to describing the ‘language system’, but acknowledges it as a fundamental feature of human language. In several detailed illustrations in chapter 6, the constructional networks of the CC in the Standard varieties and four different stages of the Dynamic Model were presented, showing how the findings can be visualized. The author hopes that this can serve as a template for further research – one gap that definitely needs to be addressed in this respect is the lack of cross-linguistic investigations. In Boas’ words, as “viable descriptive and analytical tools for cross-linguistic comparisons” (2010: 15), constructions such as the CC must be employed to address the “striking absence of cross-linguistic generalizations” (2010: 2) in Usage-based Construction Grammar.

As a decidedly *inclusive* approach, it was also shown that Usage-based Construction Grammar is quite naturally able to account for features that pose challenges to the clearly *exclusive* MGG-based approaches. Thus, under MGG-based approaches many interesting features of the CC construction have been described as idiosyncrasies, leading to the use of terminology such as ‘exception’, ‘ban’, and ‘special’ or ‘non-standard’. Given the extremely high productivity and variability of CC construction and the obvious formal and semantic relatedness between the different types of CC discussed in this study, however, it appears

inappropriate to simply relegate it to the ‘periphery’ of grammar. Rather, it makes more sense to speak of construction-specific features, each of which serves a particular purpose. Thus, under a Usage-based Construction Grammar approach, *that*-complementizers, subject-auxiliary inversion (SAI), the reversed C2C1 order, or stacked CCs pose no problem: They are easily accommodated as separate nodes in the overall CC constructional network. Furthermore, it turned out that a decisive advantage of the Usage-based Construction Grammar approach lies in its flexibility: As discussed in chapter 6, it appears more appropriate to speak of *degrees of grammaticality* when describing constructions. Especially in light of the experimental results, it seems that a simple dichotomy that only allows for constructions and their various features to be either part of a language system or not is insufficient. This also applies to the commonly encountered question of whether or not the CC is a paratactic or hypotactic construction, which is better rephrased as *how* paratactic or hypotactic the CC construction is in a given language.

Another aim of the present study was to demonstrate how the fields of World Englishes and Construction grammar can be brought together in a fruitful symbiosis, addressing a gap in research that was already noted some twenty years ago by Schneider, who wrote that “[o]nly rarely have New Englishes been employed as test cases for general questions of language theory” (2003: 237). However, combining World Englishes research with more general linguistic theory results in plenty of added value to both fields. In the words of Brunner and Hoffmann (2020: 2),

constructionist assumptions about cognitive backgrounds of language use can be put to the test in a large laboratory of language variation and change, and the analysis of World Englishes can be put on a firmer cognitive footing than a predominantly sociolinguistic analysis such as the Dynamic Model would allow.

Thus, the predictive power of the Dynamic Model (DM) – that is, a correlation between evolutionary stages and linguistic features – was demonstrated using various ‘tools’ that are commonly employed in the context of Usage-based Construction Grammar investigations (e.g. covarying-collexeme analysis and HCFA) and conversely, it was shown how principles known from cognitive approaches to language can explain both generalizations across varieties as well as variety and DM stage-specific effects. It was therefore possible to “disentangle variety-specific from general linguistic phenomena” (Hoffmann 2019: 186) and make a significant contribution to the “aspirations toward universal applicability” of CxG (Fried 2017: 249).

Finally, the present study was also an attempt at lifting the veil concealing the ‘machinery’ that is at work behind human language, allowing for its potential of infinite creativity. As it turns out, when trying to answer the question “what it is that speakers know outright about their language and what it is that they have to be able to figure out” (Fillmore et al. 1988: 502), Usage-based Construction Grammar offers a plausible explanation in the form of meso-constructional networks whose most striking characteristic is a high degree of redundancy (see above). At the end of the day, however, it must be conceded that no matter under what approach language is analyzed, we are restricted to observations on the ‘surface’ (as discussed in chapter 1). That is, whatever conclusions are drawn about the mechanics of language, and no matter in which theoretical context this is done, it must be acknowledged that, to return to David W. Anthony’s remark (see above), in linguistics, because it is not religion, there can never be absolute certainty (even though one regularly encounters linguists that conduct

themselves like religious zealots). And it makes sense to heed Langacker's words that "[w]hat one finds in language depends in large measure on what one expects to find" (1987: 1). In this spirit, while hoping to have been able to convince the reader of the advantages of Usage-based Construction Grammar in accounting for the CC construction in Present-day English and its varieties, the author acknowledges that there are other approaches to language, and that the evidence presented here may also be fruitfully analyzed embedded in other theoretical frameworks. In any case, the linguist is well advised to approach his object of inquiry humbly in the spirit of the Socratic paradox.

Appendix

Note: There is an OSF repository (<https://osf.io/qar62/>) containing all data used in this thesis. This includes corpus data from BNC, COCA and GloWbE as well as all documents related to the METs, including scans of the completed questionnaires, and data sets containing the MET results.

A.5.1 Stepwise regression modeling of the *that*-complementizer experiment data

Package *lmerTest*, function: *step*

Formula: $Z_SCORE \sim THAT_C1 * THAT_C2 * VARIETY + (1|SUBJECT) + (1|LEXICALIZATION) + (1|MS)$

Backward reduced random-effect table:

	Eliminated	npar	logLik	AIC	LRT	Df	Pr(>Chisq)
<none>		28	-1920.4	3896.8			
(1 MS)	1	27	-1920.6	3895.2	0.4448	1	0.50481
(1 SUBJECT)	2	26	-1922.5	3897.0	3.8131	1	0.05085 .
(1 LEXICALIZATION)	0	25	-1934.1	3918.1	23.0963	1	0.000001541 ***

Backward reduced fixed-effect table:

Degrees of freedom method: Satterthwaite

	Eliminated	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
THAT_C1:THAT_C2:VARIETY	1	3.8900	0.7780	5	1474.3	1.1246	0.34518
THAT_C2:VARIETY	2	6.4491	1.2898	5	1472.5	1.8624	0.09797 .
THAT_C1:THAT_C2	0	15.9273	15.9273	1	1517.3	22.9197	0.000001854 ***
THAT_C1:VARIETY	0	10.0965	2.0193	5	1457.5	2.9058	0.01287 *

Model found:

$Z_SCORE \sim THAT_C1 + THAT_C2 + VARIETY + (1 | LEXICALIZATION) + THAT_C1:THAT_C2 + THAT_C1:VARIETY$

Type III Analysis of Variance Table with Satterthwaite's method

	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
THAT_C1	46.841	46.841	1	1519.6	67.4053	0.0000000000000004669 ***
THAT_C2	56.374	56.374	1	1514.0	81.1228	< 0.00000000000000022 ***
VARIETY	21.177	4.235	5	1515.0	6.0947	0.0000134648136781258 ***
THAT_C1:THAT_C2	15.927	15.927	1	1517.3	22.9197	0.0000018539129236859 ***
THAT_C1:VARIETY	10.097	2.019	5	1457.5	2.9058	0.01287 *

Model testing:

Evidence ratio: 144,894,104,317,901,466,098,420,862,222,484

R^2 marginal: 0.1291088

R^2 conditional: 0.148074

A.5.2 Stepwise regression modeling of the asymmetric encoding experiment data

Package *lmerTest*, function: `step`

Formula: $Z_SCORE \sim AS_C1*THEN_C2*VARIETY + (1|LEXICALIZATION) + (1|SUBJECT)$

Backward reduced random-effect table:

	Eliminated	npar	logLik	AIC	LRT	Df	Pr(>Chisq)
<none>		27	-1969.3	3992.6			
(1 SUBJECT)	1	26	-1970.3	3992.6	1.9609	1	0.1614
(1 LEXICALIZATION)	0	25	-1981.8	4013.7	23.0583	1	0.000001572 ***

Backward reduced fixed-effect table:

Degrees of freedom method: Satterthwaite

	Eliminated	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
AS_C1:THEN_C2:VARIETY	1	4.9524	0.9905	5	1531.3	1.3960	0.22279
AS_C1:VARIETY	2	2.7731	0.5546	5	1536.2	0.7807	0.56354
AS_C1:THEN_C2	3	2.4692	2.4692	1	1539.4	3.4780	0.06238 .
AS_C1	0	30.7901	30.7901	1	1540.4	43.3012	0.00000000006414 ***
THEN_C2:VARIETY	0	9.3223	1.8645	5	1540.6	2.6220	0.02275 *

Model found:

$Z_SCORE \sim AS_C1 + THEN_C2 + VARIETY + (1 | LEXICALIZATION) + THEN_C2:VARIETY$

Type III Analysis of Variance Table with Satterthwaite's method

	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
AS_C1	30.790	30.790	1	1540.4	43.3012	0.000000000064142687 ***
THEN_C2	44.396	44.396	1	1541.0	62.4358	0.000000000000005197 ***
VARIETY	1.116	0.223	5	1540.0	0.3139	0.90484
THEN_C2:VARIETY	9.322	1.864	5	1540.6	2.6220	0.02275 *

Model testing:

Evidence ratio: 24,580,293,734,296,289,542,424 R^2 marginal: 0.09471129 R^2 conditional: 0.1181104

A.5.3 Stepwise regression modeling of the object pronoun extraction experiment data

Package *lmerTest*, function: `step`

Formula: $Z_SCORE \sim OBJ_C1 * OBJ_C2 * VARIETY + (1|LEXICALIZATION) + (1|MS)$

Backward reduced random-effect table:

	Eliminated	npar	logLik	AIC	LRT	Df	Pr(>Chisq)
<none>		27	-1085.2	2224.4			
(1 MS)	1	26	-1085.7	2223.4	1.0187	1	0.312823
(1 LEXICALIZATION)	0	25	-1089.8	2229.7	8.2510	1	0.004073 **

Backward reduced fixed-effect table:

Degrees of freedom method: Satterthwaite

	Eliminated	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
OBJ_C1:OBJ_C2:VARIETY	1	1.9533	0.3907	5	818.66	0.5354	0.74958
OBJ_C2:VARIETY	2	1.2380	0.2476	5	823.08	0.3404	0.88850
OBJ_C1:VARIETY	3	2.7571	0.5514	5	829.74	0.7611	0.57803
VARIETY	4	6.9767	1.3953	5	832.81	1.9289	0.08719 .
OBJ_C1:OBJ_C2	0	31.3176	31.3176	1	837.20	43.0565	0.0000000009312 ***

Model found:

$Z_SCORE \sim OBJ_C1 + OBJ_C2 + (1 | LEXICALIZATION) + OBJ_C1:OBJ_C2$

Type III Analysis of Variance Table with Satterthwaite's method

	Sum Sq	Mean Sq	NumDF	DenDF	F value	Pr(>F)
OBJ_C1	2.7404	2.7404	1	837.28	3.7676	0.052590 .
OBJ_C2	6.1654	6.1654	1	837.23	8.4764	0.003693 **
OBJ_C1:OBJ_C2	31.3176	31.3176	1	837.20	43.0565	0.0000000009312 ***

Model testing:

Evidence ratio: 786,672,649 R^2 marginal: 0.0598872 R^2 conditional: 0.08303186

References

- Abeillé, Anne & Robert D. Borsley. 2008. Comparative Correlatives and Parameters. *Lingua* 118(8). 1139–1157.
- Abeillé, Anne, Robert D. Borsley & Maria-Teresa Espinal. 2006. The syntax of Comparative Correlatives in French and Spanish. In Stefan Müller (ed.), *Proceedings of the 13th International Conference on Head-Driven Phrase Structure Grammar*, 6–26. Stanford, CA: CSLI Publications.
- Anthony, David W. 2007. *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World*. Princeton, Oxford: Princeton UP.
- Aston, Guy & Lou Burnard. 1998. *The BNC Handbook: Exploring the British National Corpus with SARA*. (Ed.) Tony McEnery & Andrew Wilson. Edinburgh: Edinburgh UP.
- Baayen, Harald R. 2008. *Analyzing Linguistic Data: A Practical Introduction to Statistics using R*. Cambridge: Cambridge UP.
- Baayen, Harald R. 2011. Corpus linguistics and naive discriminative learning. *Brazilian Journal of Applied Linguistics* 11. 295–328.
- Bard, Ellen G., Dan Robertson & Antonella Sorace. 1996. Magnitude estimation of linguistic acceptability. *Language* 72(1). 32–68.
- Barðdal, Johanna. 2008. *Productivity: Evidence from Case and Argument Structure in Icelandic* (Constructional Approaches to Language 8). Amsterdam: John Benjamins.
- Barðdal, Johanna. 2011. Lexical vs. structural case: A false dichotomy. *Morphology* 21(1). 619–654.
- Baroni, Marco & Stefan Evert. 2006. Counting Words: LNRE Modelling. Málaga. http://zipfr.r-forge.r-project.org/materials/ESSLLI/03_inre_modeling.handout.pdf (8 February, 2021).
- Baroni, Marco & Stefan Evert. 2014. The zipfR Package for Lexical Statistics: A Tutorial Introduction. <http://zipfr.r-forge.r-project.org/materials/zipfr-tutorial.pdf> (20 October, 2018).
- Barr, Dale J., Roger Levy, Christopher Scheepers & Harry J. Tily. 2013. Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language* 68(3). 255–278.
- Bates, Douglas. 2005. Fitting Linear Mixed Models in R Using the lme4 package. *R News* 5(1). 27–30.
- Bates, Douglas. 2010. *lme4: Mixed-effects Modeling with R*. New York: Springer.
- Bates, Douglas, Martin Mächler, Ben Bolker & Steve Walker. 2015. Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software* 67(1). 1–48.
- Bates, Douglas, Martin Mächler, Ben Bolker & Steve Walker. 2020. Package “lme4”. Reference manual for the package. <http://cran.r-project.org/web/packages/lme4/lme4.pdf>.

- Bauer, Laurie. 2002. *An introduction to international varieties of English* (Edinburgh Textbooks on the English Language). Edinburgh: Edinburgh UP.
- Beck, Sigrid. 1997. On the Semantics of Comparative Conditionals. *Linguistics and Philosophy* 20(3). 229–271.
- Bekker, Ian. 2009. *The vowels of South African English*. North West University South Africa: PhD Thesis.
- Bencini, Giulia M. L. 2013. Psycholinguistics. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 379–396. Oxford: Oxford UP.
- Bergs, Alexander. 2018. Learn the Rules like a Pro, so you can Break them like an Artist (Picasso): Linguistic Aberrancy from a Constructional Perspective. *Zeitschrift für Anglistik und Amerikanistik* 66(4). 277–293.
- Biber, Douglas & Susan Conrad. 2009. *Register, Genre, and Style* (Cambridge Textbooks in Linguistics). Cambridge: Cambridge UP.
- Bickerton, Derek. 1981. *Roots of Language*. Ann Arbor MI: Karoma Publishers.
- Bickerton, Derek. 1984. The language bioprogram hypothesis. *Behavioral and Brain Sciences* 7(2). 173–221.
- Bickerton, Derek. 2008. *Bastard Tongues: A Trailblazing Linguist Finds Clues to our Common Humanity in the World's Lowliest Languages*. New York: Hill & Wang.
- Boas, Hans C. 2010. Comparing constructions across languages. In Hans C. Boas (ed.), *Contrastive Studies in Construction Grammar* (Constructional Approaches to Language 10), 1–20. Amsterdam: John Benjamins.
- Bolton, Kingsley. 2020. World Englishes: Current Debates and Future Directions. In Cecil L. Nelson, Zoya G. Proshina & Daniel R. Davis (eds.), *The Handbook of World Englishes*, 743–760. Second edition. Hoboken, NJ: Wiley Blackwell.
- Borsley, Robert D. 2003. On the Periphery: comparative correlatives in Polish and English. In Piotr Bański & Przepiórkowski (eds.), *Proceedings of Fifth Generative Linguistics in Poland Conference*, 15–28. Warsaw: Polish Academy of Sciences.
- Borsley, Robert D. 2004. An Approach to English Comparative Correlatives. In Stefan Müller (ed.), *Proceedings of the 11th International Conference on Head-Driven Phrase Structure Grammar, Center for Computational Linguistics, Katholieke Universiteit Leuven*, 70–92. Stanford, CA: CSLI Publications.
- Borsley, Robert D. 2011. Constructions, Functional Heads, and Comparative Correlatives. In Olivier Bonami & Patricia Cabredo Hofherr (eds.), *Empirical Issues in Syntax and Semantics*, 7–20.
- Bortz, Jürgen, Gustav A. Lienert & Klaus Boehnke. 1990. *Verteilungsfreie Methoden in der Biostatistik*. Berlin: Springer.
- Bowerman, Sean. 2008. White South African English: morphology and syntax. In Rajend Mesthrie (ed.), *Varieties of English: Africa, South and Southeast Asia* (Varieties of English), vol. 4, 472–487. Berlin; New York: Mouton de Gruyter.
- Brasoveanu, Adrian. 2008. Comparative and equative correlatives as anaphora to differentials. Poster presented at Semantics and Linguistic Theory 18, University of Massachusetts Amherst, and at the 9th Semfest, Stanford.

- Bresnan, Joan. 2007. Is syntactic knowledge probabilistic? Experiments with the English dative alternation. In Sam Featherston & Wolfgang Sternefeld (eds.), *Roots: linguistics in search of its evidential base* (Studies in Generative Grammar 96), 75–96. Berlin: De Gruyter.
- Bresnan, Joan & Marilyn Ford. 2010. Predicting Syntax: Processing Dative Constructions in American and Australian Varieties of English. *Language* 86(1). 168–213.
- Brunner, Thomas & Thomas Hoffmann. 2020. The way-construction in World Englishes. *English World-Wide* 41(1). 1–32.
- Buregeya, Alfred. 2019. *Kenyan English* (Dialects of English). (Ed.) Joan C. Beal, Karen P. Corrigan & Bernd Kortmann. Vol. 14. Boston/Berlin: Walter de Gruyter.
- Buschfeld, Sarah, Thomas Hoffmann, Magnus Huber & Alexander Kautzsch. 2014. Introduction. In *The Evolution of Englishes: The Dynamic Model and beyond* (Varieties of English Around the World: G49), 1–20. Amsterdam/Philadelphia: John Benjamins.
- Bybee, Joan L. 2006. From Usage to Grammar: The Mind's Response to Repetition. *Language* 82(4). 711–733.
- Bybee, Joan L. 2010. *Language, Usage and Cognition*. Cambridge: Cambridge UP.
- Bybee, Joan L. 2012. Domain-general processes as the basis for grammar. In Maggie Tallerman & Kathleen R. Gibson (eds.), *The Oxford Handbook of Language Evolution*, 528–536. Oxford: Oxford UP.
- Bybee, Joan L. 2013. Usage-based theory and exemplar representation. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 49–69. Oxford: Oxford UP.
- Cappelle, Bert. 2011. The *the... the...* construction: Meaning and readings. *Journal of Pragmatics* 43(1). 99–117.
- Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1981. *Lectures on government and binding* (Studies in Generative Grammar 9). Dordrecht, Netherlands: Foris Publications.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A life in language*, 1–52. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2002. *Syntactic Structures*. 2nd ed. Berlin, New York: De Gruyter Mouton.
- Croft, William. 2001. *Radical Construction Grammar: Syntactic Theory in Typological Perspective*. Oxford: Oxford UP.
- Croft, William. 2013. Radical construction grammar. In *The Oxford Handbook of Construction Grammar*, 211–232. Oxford: Oxford UP.
- Croft, William & D. Alan Cruse. 2004. *Cognitive Linguistics*. Cambridge: Cambridge UP.
- Crystal, David. 2003. *English as a Global Language*. Second edition. Cambridge: Cambridge UP.
- Crystal, David. 2008. Two thousand million? *English Today* 93 24(1). 3–6.

- Cuervo, Rufino José. 1954. *Diccionario de construcción y régimen de la lengua castellana*. Bogotá: Instituto Caro y Cuervo.
- Culicover, Peter W. & Ray Jackendoff. 1999. The View from the Periphery: The English Comparative Correlative. *Linguistic Inquiry* 30(4). 543–571.
- Culicover, Peter W. & Ray Jackendoff. 2005. *Simpler syntax*. Oxford: Oxford UP.
- Currie, Oliver. 2000. Word Order Stability and Change from a Sociolinguistic Perspective: The Case of Early Modern Welsh. In Rosanna Sornicola, Erich Poppe & Ariel Shisha-Halevy (eds.), *Stability, Variation and Change of Word-Order Patterns over Time* (Current Issues in Linguistic Theory 213), 203–230. Amsterdam/Philadelphia: John Benjamins.
- Dąbrowska, Ewa & Dagmar Divjak. 2015. *Handbook of Cognitive Linguistics*. Berlin: De Gruyter Mouton.
- Dancygier, Barbara. 2017. *The Cambridge Handbook of Cognitive Linguistics*. Cambridge: Cambridge UP.
- Davies, Mark. 2004. BYU-BNC. (Based on the British National Corpus from Oxford University Press). <https://www.english-corpora.org/bnc/>.
- Davies, Mark. 2008. The Corpus of Contemporary American English (COCA): 520 million words, 1990-present. <https://www.english-corpora.org/coca/>.
- Davies, Mark. 2009. The 385+ million word Corpus of Contemporary American English (1990-2008+): Design, architecture, and linguistic insights. *International Journal of Corpus Linguistics* 14(2). 159–190.
- Davies, Mark. 2010. The Corpus of Contemporary American English as the first reliable monitor corpus of English. *Literary and Linguistic Computing* 25(4). 447–464.
- Davies, Mark. 2013. Corpus of Global Web-based English: 1.9 Billion Words from Speakers in 20 Countries (GloWbE). <https://www.english-corpora.org/glowbe/>.
- Davies, Mark & Robert Fuchs. 2015a. A reply. *English World-Wide* 36(1). 45–47.
- Davies, Mark & Robert Fuchs. 2015b. Expanding horizons in the study of World Englishes with the 1.9 billion word Global Web-based English Corpus (GloWbE). *English World-Wide* 36(1). 1–28.
- Dayal, Veneeta. 1996. *Locality in Wh quantification: Questions and relative clauses in Hindi* (Studies in Linguistics and Philosophy 62). Dordrecht, Netherlands: Kluwer.
- Diessel, Holger. 2013. Construction grammar and first language acquisition. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 347–364. Oxford: Oxford UP.
- Diessel, Holger. 2015. Usage-based Construction Grammar. In Ewa Dąbrowska & Dagmar Divjak (eds.), *Handbook of Cognitive Linguistics*, 295–321. Berlin: De Gruyter Mouton.
- Dikken, Marcel den. 2003. Comparative correlatives and verb second.
- Dikken, Marcel den. 2005. Comparative Correlatives Comparatively. *Linguistic Inquiry* 36(4). 497–532.
- Du Plessis, Deon. 2015. *Regionality in White South African English: an acoustic dialectometric investigation*. North West University South Africa: Master's Thesis.

- Ellis, Nick C. 2013. Construction grammar and second language acquisition. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 365–378. Oxford: Oxford UP.
- Evans, Vyvyan & Melanie Green. 2006. *Cognitive Linguistics: An Introduction*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Evert, Stefan. 2004. A Simple LNRE Model for Random Character Sequences. In Gérard Purnelle, Cédric Fairon & Anne Dister (eds.), *Le poids des mots: Proceedings of the 7th International Conference on Textual Data Statistical Analysis*, 411–422. Louvain-la-Neuve: UCL.
- Evert, Stefan & Marco Baroni. 2007. zipfR: Word frequency distributions in R. In *Proceedings of the 45th Annual Meeting of the Association for Computational Linguistics, Posters and Demonstrations Session*. Prague, Czech Republic. <http://purl.org/stefan.evert/PUB/EvertBaroni2007.pdf> (15 February, 2021).
- Evert, Stefan & Marco Baroni. 2020. zipfR: Statistical Models for Word Frequency Distributions. R package version 0.6-70. <https://cran.r-project.org/package=zipfR>.
- Fanselow, Gisbert. 2007. Carrots – perfect as vegetables, but please not as a main dish. *Theoretical Linguistics* 33(3). 353–367.
- Faraway, Julian J. 2006. *Extending the Linear Model with R* (Texts in Statistical Science). Boca Raton: Chapman & Hall/CRC.
- Featherston, Sam. 2004. Bridge verbs and V2 verbs – the same thing in spades? *Zeitschrift für Sprachwissenschaft* 23. 181–210.
- Featherston, Sam. 2007a. Data in generative grammar: the stick and the carrot. *Theoretical Linguistics* 33(3). 269–318.
- Featherston, Sam. 2007b. Reply. *Theoretical Linguistics* 33(3). 319–333.
- Field, Andy, Jeremy Miles & Zöe Field. 2012. *Discovering Statistics Using R*. London: Sage.
- Fillmore, Charles J. 1987. Varieties of conditional sentences. In *Proceedings of the Eastern States Conference on Linguistics*, vol. 3, 163–182.
- Fillmore, Charles J, Paul Kay, Laura Michaelis & Ivan A. Sag. 2007. Sign-Based Construction Grammar. Unpublished Manuscript.
- Fillmore, Charles J, Paul Kay & Mary Catherine O'Connor. 1988. Regularity and idiomaticity in grammatical constructions: The case of *let alone*. *Language* 64(3). 501–538.
- Firbas, Jan. 1964. From comparative word-order studies : (thoughts on V. Mathesius' conception of the word-order system in English compared with that in Czech). *Brno studies in English* 4. 111–128.
- Firbas, Jan. 1992. *Functional Sentence Perspective in Written and Spoken Communication*. Cambridge: Cambridge UP.
- Floris, Flora Debora. 2014. Idea sharing: Introducing English as an International Language (EIL) to pre-service teachers in a World Englishes course. *PASAA* 47. 215–232.
- Fodor, Janet Dean. 2001. Parameters and the periphery: reflections on Syntactic nuts. *Journal of Linguistics* 37. 367–392.
- Francis, Elaine J. 2015. Review of “Cross-linguistic variation and efficiency” by John A. Hawkins. *Language* 91(1). 253–255.
- Fried, Mirjam. 2017. Construction Grammar in the Service of Slavic Linguistics, and Vice Versa. *Journal of Slavic Linguistics* 25(2). 241–276.

- Friendly, Michael & David Meyer. 2016. *Discrete Data Analysis with R: Visualization and Modeling Techniques for Categorical and Count Data*. Boca Raton: CRC Press, Taylor & Francis Group.
- Garside, Roger & Nicholas Smith. 1997. A hybrid grammatical tagger: CLAWS4. In Roger Garside, Geoffrey Leech & Tony McEnery (eds.), *Corpus Annotation: Linguistic Information from Computer Text Corpora*, 102–121. London: Longman.
- Geeraerts, Dirk & Hubert Cuyckens. 2010. *The Oxford Handbook of Cognitive Linguistics*. Oxford: Oxford UP.
- Gilquin, Gaëtanelle & Stefan Th. Gries. 2009. Corpora and experimental methods: A state-of-the-art review. *Corpus Linguistics and Linguistic Theory* 5(1). 1–26.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: The University of Chicago Press.
- Goldberg, Adele E. 2003. Constructions: a new theoretical approach to language. *TRENDS in Cognitive Sciences* 7(5). 219–224.
- Goldberg, Adele E. 2006. *Constructions at Work: The nature of generalization in language*. Oxford: Oxford UP.
- Goldberg, Adele E. 2013. Argument structure constructions versus lexical rules or derivational verb templates. *Mind & Language* 28(4). 435–465.
- Goldberg, Adele E. 2019. *Explain me this: creativity, competition, and the partial productivity of constructions*. Princeton, Oxford: Princeton UP.
- Goldberg, Adele E., Devin M. Casenhiser & Nitya Sethuraman. 2004. Learning argument structure generalizations. *Cognitive Linguistics* 15(3). 289–316.
- Gordon, Raymond G. & Barbara F. Grimes. 2019. *Ethnologue: languages of the world*. Dallas: SIL International.
- Görlach, Manfred. 1990. *Studies in the history of the English language*. Heidelberg: Carl Winter.
- Greenbaum, Sidney & Gerald Nelson. 1996. The International Corpus of English (ICE) Project. *World Englishes* 15(1). 3–15.
- Gries, Stefan Th. 2004. HCFA 3.2 – A Program for Hierarchical Configurational Frequency Analysis for R for Windows.
- Gries, Stefan Th. 2007. Coll.analysis 3.2a. A program for R for Windows 2.x.
- Gries, Stefan Th. 2008. *Statistik für Sprachwissenschaftler* (Studienbuch Zur Linguistik). Vol. 13. Göttingen: Vandenhoeck and Ruprecht.
- Gries, Stefan Th. 2009. *Statistics for Linguistics with R: A Practical Introduction* (Trends in Linguistics: Studies and Monographs: 208). 1st edition. Berlin: De Gruyter Mouton.
- Gries, Stefan Th. 2011. Corpus data in usage-based linguistics: What's the right degree of granularity for the analysis of argument structure constructions? In Mario Brdar, Stefan Th. Gries & Milena Žic Fuchs (eds.), *Cognitive linguistics: Convergence and expansion*, 237–256. Amsterdam/Philadelphia: John Benjamins.
- Gries, Stefan Th. 2013. Data in construction grammar. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 93–108. Oxford: Oxford UP.

- Gries, Stefan Th. 2015a. Quantitative designs and statistical techniques. In Douglas Biber & Randi Reppen (eds.), *The Cambridge Handbook of English Corpus Linguistics*, 50–71. Cambridge: Cambridge UP.
- Gries, Stefan Th. 2015b. The role of quantitative methods in Cognitive Linguistics: Corpus and experimental data on (relative) frequency and contingency of words and constructions. In Jocelyne Daems, Kris Heylen, Dirk Speelman & Hubert Cuyckens (eds.), *Change of paradigms-new paradoxes: recontextualizing language and linguistics*, 311–325. Berlin; New York: De Gruyter Mouton.
- Gries, Stefan Th. 2017. *Quantitative Corpus Linguistics with R: A Practical Introduction*. 2nd edition. New York and London: Routledge.
- Gries, Stefan Th., Beate Hampe & Doris Schönefeld. 2005. Converging evidence: Bringing together experimental and corpus data on the association of verbs and constructions. *Cognitive Linguistics* 16(4). 635–676.
- Gries, Stefan Th. & Joybrato Mukherjee. 2010. Lexical gravity across varieties of English. An ICE-based study of n-grams in Asian Englishes. *International Journal of Corpus Linguistics* 15(4). 520–548.
- Gries, Stefan Th. & Anatol Stefanowitsch. 2004. Extending collocation analysis. *International Journal of Corpus Linguistics* 9(1). 97–129.
- Gries, Stefan Th. & Anatol Stefanowitsch. 2006. Corpus-based methods and cognitive semantics: The many meanings of to run. In Stefan Th. Gries & Anatol Stefanowitsch (eds.), *Corpora in cognitive linguistics: Corpus-based approaches to syntax and lexis*, 57–99. Berlin: Mouton de Gruyter.
- Gries, Stefan Th. & Anatol Stefanowitsch. 2009. Corpora and grammar. In Anke Lüdeling & Merja Kytö (eds.), *Corpus linguistics: An international handbook* ((Handbücher Zur Sprach- Und Kommunikationswissenschaft), vol. 29, 933–952. Berlin: Mouton de Gruyter.
- Gries, Stefan Th. & Anatol Stefanowitsch. 2010. Cluster analysis and the identification of collexeme classes. In Sally Rice & John Newman (eds.), *Experimental and Empirical Methods in the Study of Conceptual Structure, Discourse, and Language*, 73–90. Stanford, CA: CSLI Publications.
- Gupta, Anthea Fraser. 1994. *The step-tongue: Children's English in Singapore*. Clevedon: Multilingual Matters.
- Gutiérrez-Rexach, Javier. 2009. Correlativization and Degree Quantification in Spanish. In Pascual José Masullo, Erin O'Rourke & Chia-Hui Huang (eds.), *Romance Linguistics 2007: Selected papers from the 37th Linguistic Symposium on Romance Languages (LSRL), Pittsburgh, 15–18 March 2007* (Current Issues in Linguistic Theory IV), vol. 304, 121–142. Amsterdam: John Benjamins.
- Hawkins, John A. 2004. *Efficiency and complexity in grammars*. Oxford: Oxford UP.
- Hawkins, John A. 2014. *Cross-linguistic variation and efficiency*. Oxford: Oxford UP.
- Hickey, Raymond. 2020. English in South Africa: Contact and Change. In Raymond Hickey (ed.), *English in Multilingual South Africa: The Linguistics of Contact and Change* (Studies in English Language), 3–15. Cambridge: Cambridge UP.
- Hilgendorf, Suzanne K. 2020. Euro-Englishes. In Cecil L. Nelson, Zoya G. Proshina & Daniel R. Davis (eds.), *The Handbook of World Englishes*, 215–231. Second edition. Hoboken, NJ: Wiley Blackwell.

- Hilpert, Martin. 2013. *Constructional Change in English: Developments in Allomorphy, Word Formation, and Syntax*. Cambridge: Cambridge UP.
- Hoffmann, Thomas. 2006. Corpora and Introspection as Corroborating Evidence: The Case of Preposition Placement in English Relative Clauses. *Corpus Linguistics and Linguistic Theory* 2(2). 165–195.
- Hoffmann, Thomas. 2011. *Preposition Placement in English: A Usage-based Approach* (Studies in English Language). Cambridge: Cambridge UP.
- Hoffmann, Thomas. 2013a. Abstract Phrasal and Clausal Constructions. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar* (Oxford Handbooks in Linguistics), 307–328. Oxford UP.
- Hoffmann, Thomas. 2013b. Obtaining introspective acceptability judgements. In Manfred Krug & Julia Schlüter (eds.), *Research Methods in Language Variation and Change*, 99–118. Cambridge: Cambridge UP.
- Hoffmann, Thomas. 2014a. Comparing English Comparative Correlatives. Postdoc thesis.
- Hoffmann, Thomas. 2014b. The cognitive evolution of Englishes: The role of constructions in the Dynamic Model. In Sarah Buschfeld, Thomas Hoffmann, Magnus Huber & Alexander Kautzsch (eds.), *The Evolution of Englishes: The Dynamic Model and Beyond* (Varieties of English Around the World: G49), 160–180. Amsterdam: Benjamins.
- Hoffmann, Thomas. 2017a. Construction Grammars. In Barbara Dancygier (ed.), *The Cambridge Handbook of Cognitive Linguistics*, 310–329. Cambridge: Cambridge UP.
- Hoffmann, Thomas. 2017b. Construction Grammar as Cognitive Structuralism: The interaction of constructional networks and processing in the diachronic evolution of English comparative correlatives. *English Language and Linguistics* 21(2). 349–373.
- Hoffmann, Thomas. 2018. Comparing Comparative Correlatives: The German vs. English construction network. In Hans C. Boas & Alexander Ziem (eds.), *Constructional Approaches to Syntactic Structures in German*, 181–203. Berlin: Mouton de Gruyter.
- Hoffmann, Thomas. 2019. *English Comparative Correlatives: Diachronic and Synchronic Variation at the Lexicon-Syntax Interface* (Studies in English Language). Cambridge: Cambridge UP.
- Hoffmann, Thomas, Thomas Brunner & Jakob Horsch. 2020. English Comparative Correlative Constructions: A Usage-based account. *Open Linguistics* 6(1). 196–215.
- Hoffmann, Thomas, Jakob Horsch & Thomas Brunner. 2019. The More Data, The Better: A Usage-based Account of the English Comparative Correlative Construction. *Cognitive Linguistics* 30(1). 1–36.
- Hoffmann, Thomas & Graeme Trousdale. 2011. Variation, Change and Constructions in English [Special Issue]. *Cognitive Linguistics* 22(1). 1–209.
- Hoffmann, Thomas & Graeme Trousdale. 2013a. *The Oxford Handbook of Construction Grammar* (Oxford Handbooks in Linguistics). Oxford: Oxford UP.
- Hoffmann, Thomas & Graeme Trousdale. 2013b. Construction Grammar: Introduction. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 1–15. Oxford: Oxford UP.
- Hornstein, Norbert, Jairo Nunes & Kleantes K. Grohmann. 2005. *Understanding Minimalism* (Cambridge Textbooks in Linguistics). Cambridge: Cambridge UP.

- Horsch, Jakob. 2019. Slovak Comparative Correlatives: New Insights. *Jazykovedný časopis [Journal of Linguistics of the Slovak Academy of Sciences]* 70(2). 180–190.
- Horsch, Jakob. 2020. Vidiš tým lepšie, čím bližšie sa pozeráš: Slovak Comparative Correlative CC' Constructions from a Construction Grammar perspective. *Jazykovedný časopis [Journal of Linguistics of the Slovak Academy of Sciences]* 71(1). 25–40.
- Horsch, Jakob. 2021. Slovak Comparative Correlatives: A Usage-based Construction Grammar Account. *Constructions and Frames* 13(2). 193–229.
- Huddleston, Rodney. 2002. Comparative Constructions. In Rodney Huddleston & Geoffrey K. Pullum (eds.), *The Cambridge Grammar of the English Language*, 1097–1170. Cambridge: Cambridge UP.
- Humboldt, Wilhelm von. 1836. *On Language: The Diversity of Human Language-Structure and its Influence on the Mental Development of Mankind*. (Trans.) Peter Heath. Cambridge: Cambridge UP.
- Hundt, Marianne. 2021. On models and modelling. *World Englishes* 40(3). 298–317.
- Ivanová, Martina. 2016. *Syntax slovenského jazyka*. Second edition. Prešov: Vydav. Prešovskej Univerzity. <http://www.pulib.sk/web/kniznica/elpub/dokument/Ivanova4>.
- Jurafsky, Dan. 1992. An On-Line Computational Model of Human Sentence Interpretation. In *AAAI-92 Proceedings*, 302–308. San Jose, CA.
- Kachru, Braj B. 1988. The sacred cows of English. *English Today* 4(4). 3–8.
- Kachru, Braj B. 1992. *The Other Tongue: English across Cultures*. Second edition. Urbana, Chicago: University of Illinois Press.
- Keller, Frank. 2000. *Gradience in Grammar: Experimental and Computational Aspects of Degrees of Grammaticality*. University of Edinburgh: PhD Thesis.
- Keller, Frank & Theodora Alexopoulou. 2005. A crosslinguistic, experimental study of resumptive pronouns and that-trace effects. In Bruno G. Bara, Lawrence Barsalou & Monica Bucciarelli (eds.), *Proceedings of the 27th Annual Conference of the Cognitive Science Society*, 1120–1125.
- Kennedy, Graeme. 1998. *An Introduction to Corpus Linguistics*. London: Longman.
- Kepser, Stephan & Marga Reis. 2005. *Linguistic Evidence: Empirical, Theoretical and Computational Perspectives*. Berlin: Mouton de Gruyter.
- Kesselová, Jana & Juraj Dolník. 2010. Operátory na rozširovanie a rozvíjanie výpovede [Operators for the augmentation and development of utterances]. In *Morfologické aspekty súčasnej slovenčiny [Morphological aspects of modern Slovak]*, 326–386. Bratislava: Veda, vydavateľstvo Slovenskej akadémie vied.
- Kim, Jong-Bok. 2011. English comparative correlative construction: Interactions between lexicon and constructions. *Korean Journal of Linguistics* 36(2). 307–336.
- Kim, Hyunwoo, Gyu-Ho Shin & Haerim Hwang. 2020. Integration of verbal and constructional information in the second language processing of English dative constructions. *Studies in Second Language Acquisition* 42(4). 1–23.
- Knowles, John. 1978. The Spanish Correlatives of Comparison and Sentence Recursion. *Lingua* 46(4). 205–223.

- Kortmann, Bernd. 2014. How powerful is geography as an explanatory factor of variation? Areal features in the Anglophone world. In Peter Auer, Martin Hilpert, Anja Stukenbrock & Benedikt Szmrecsányi (eds.), *Space in Language and Linguistics: Geographical, Interactional, and Cognitive Perspectives*, 165–194. Berlin: De Gruyter.
- Kuznetsova, Alexandra, Per B. Brockhoff & Rune H. B. Christensen. 2017. lmerTest Package: Tests in Linear Mixed Effects Models. *Journal of Statistical Software* 82(13). 1–26.
- Kuznetsova, Alexandra, Brockhoff, Per B. & Rune H. B. Christensen. 2020. lmerTest: Tests for random and fixed effects for linear mixed effects models (lmer objects of lme4 package). R package version 3.1-3. <https://CRAN.R-project.org/package=lmerTest>.
- Kuznetsova, Alexandra, Rune H. B. Christensen, Cecile Bavay & Per B. Brockhoff. 2015. Automated mixed ANOVA modeling of sensory and consumer data. *Food Quality and Preference* 40. 31–38.
- Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*. Vol. 1. Stanford: Stanford UP.
- Langacker, Ronald W. 2008. *Cognitive Grammar: A Basic Introduction*. New York: Oxford UP.
- Lange, Claudia & Sven Leuckert. 2020. *Corpus linguistics for World Englishes: a guide for research* (Routledge Corpus Linguistics Guides). New York: Taylor and Francis.
- Laporte, Samantha. 2019. *The patterning of the high-frequency verb make in varieties of English: a Construction Grammar approach*. UC Louvain: PhD Thesis.
- Laporte, Samantha, Tove Larsson & Larissa Goulart. 2021. Testing the Principle of No Synonymy across levels of abstraction. *Constructions and Frames* 13(2). 230–262.
- Leech, Geoffrey. 1991. The state of art in corpus linguistics. In Karin Aijmer (ed.), *English Corpus Linguistics*, 8–29. London: Longman.
- Leech, Geoffrey. 1992. Corpora and theories of linguistic performance. In Jan Svartvik (ed.), *Directions in Corpus Linguistics*, 105–122. Berlin: Mouton de Gruyter.
- Leech, Geoffrey. 2013. BNC: A brief user's guide to the grammatical tagging of the British National Corpus. <http://www.natcorp.ox.ac.uk/docs/gramtag.html> (15 March, 2021).
- Lin, Jo-Wang. 2007. On the semantics of comparative correlatives in Mandarin Chinese. *Journal of Semantics* 24(2). 169–213.
- Mair, Christian. 2005. Tracking Ongoing Grammatical Change and Recent Diversification in Present-day Standard English: The Complementary Role of Small and Large Corpora. In Johannes Schwitalla & Werner Wegstein (eds.), *Korpuslinguistik deutsch: synchron - diachron - kontrastiv: Würzburger Kolloquium 2003*, 9–26. Tübingen: Max Niemeyer Verlag.
- Mair, Christian. 2008. *English linguistics: An introduction*. Tübingen: Narr Francke Attempto Verlag.
- Mair, Christian. 2015. Response to Davies and Fuchs. *English World-Wide* 36(1). 29–33.
- Makalela, Leketi. 2013. Black South African English on the radio. *World Englishes* 32(1). 93–107.
- Mantlik, Annette & Hans-Jörg Schmid. 2018. That-complementizer omission in N + BE + that-clauses – register variation or constructional change? In Alex Ho-Cheong Leung

- & Wim van der Wurff (eds.), *The Noun Phrase in English: Past and Present*, 187–222. Amsterdam: John Benjamins.
- McArthur, Tom. 1987. The English languages? *English Today* 3(3). 9–11.
- McCawley, James D. 1988. The Comparative Conditional Construction in English, German, and Chinese. In Shelley Axmaker, Annie Jaisser & Helen Singmaster (eds.), *General Session and Parasession on Grammaticalization: Proceedings of the Fourteenth Annual Meeting, February 13-15, 1988*, 176–187. Berkeley: Berkeley Linguistics Society.
- McEnery, Tony & Andrew Wilson. 2001. *Corpus Linguistics*. Edinburgh: Edinburgh UP.
- McEnery, Tony, Richard Xiao & Yukio Tono. 2006. *Corpus-based Language Studies: An Advanced Resource Book*. London: Routledge.
- Mesthrie, Rajend. 2006. Anti-deletions in an L2 grammar: A study of Black South African English mesolect. *English World-Wide* 27. 111–145.
- Mesthrie, Rajend. 2008a. English circling the globe. *English Today* 24(1). 28–32.
- Mesthrie, Rajend. 2008b. Black South African English: morphology and syntax. In Rajend Mesthrie (ed.), *Varieties of English: Africa, South and Southeast Asia* (Varieties of English), vol. 4, 488–500. Berlin; New York: Mouton de Gruyter.
- Mesthrie, Rajend. 2008c. Indian South African English: morphology and syntax. In Rajend Mesthrie (ed.), *Varieties of English: Africa, South and Southeast Asia* (Varieties of English), vol. 4, 501–520. Berlin; New York: Mouton de Gruyter.
- Mesthrie, Rajend. 2012. Deletions, antideletions and complexity theory, with special reference to Black South African and Singaporean Englishes. In Bernd Kortmann & Benedikt Szmrecsányi (eds.), *Linguistic Complexity: Second Language Acquisition, Indigenization, Contact*, 90–100. Berlin; New York: De Gruyter.
- Mesthrie, Rajend & Rakesh Bhatt. 2008. *World Englishes: The Study of New Linguistic Varieties*. Cambridge: Cambridge UP.
- Mesthrie, Rajend, Alida Chevalier & Timothy Dunne. 2015. A Regional and Social Dialectology of the BATH Vowel in South African English. *Language Variation and Change* 27. 1–30.
- Michaelis, Laura. 1994. A case of constructional polysemy in Latin. *Studies in Language* 18(1). 45–70.
- Mollin, Sandra. 2006. *Euro-English: Assessing Variety Status* (Language in Performance). Tübingen: Narr Francke Attempto Verlag.
- Mpiranya, Fidèle. 2015. *Swahili Grammar and Workbook*. New York: Routledge.
- Mugane, John M. 1997. *A paradigmatic grammar of Gĩkũyũ*. Stanford, CA: CSLI Publications.
- Mukherjee, Joybrato. 2015. Response to Davies and Fuchs. *English World-Wide* 36(1). 34–37.
- Mukherjee, Joybrato & Stefan Th. Gries. 2009. Collostructional nativisation in new Englishes: Verb-construction associations in the International Corpus of English. *English World-Wide* 30(1). 27–51.
- Mukherjee, Joybrato & Sebastian Hoffmann. 2006. Describing verb-complementational profiles of New Englishes. *English World-Wide* 27(2). 147–173.

- Müller, Stefan. 2019. *Grammatical theory: From transformational grammar to constraint-based approaches*. Third revised and extended edition. Berlin: Language Science Press. <https://langsci-press.org/catalog/book/255>.
- Ndukū Kīoko, Angelina. 2019. *A grammar of Kīikamba*. Nairobi: Twaweza Communications Limited.
- Nelson, Gerald. 2015. Response to Davies and Fuchs. *English World-Wide* 36(1). 38–40.
- Newmeyer, Frederick J. 2007. Commentary on Sam Featherston, ‘Data in generative grammar: The stick and the carrot’. *Theoretical Linguistics* 33(3). 395–399.
- Ostler, Nicholas. 2005. *Empires of the Word: A language history of the world*. New York: Harper Perennial.
- Pasch, Bret, Benjamin M. Bolker & Steven M. Phelps. 2013. Interspecific Dominance Via Vocal Interactions Mediates Altitudinal Zonation in Neotropical Singing Mice. *The American Naturalist* 182(5). E161–E173.
- Perek, Florent. 2012. Alternation-based generalizations are stored in the mental grammar: Evidence from a sorting task experiment. *Cognitive Linguistics* 23(3). 601–635.
- Pulvermüller, Friedemann, Yury Shtyrov & Bert Cappelle. 2013. Brain basis of meaning, words, constructions, and grammar. In Thomas Hoffmann & Graeme Trousdale (eds.), *The Oxford Handbook of Construction Grammar*, 397–416. Oxford: Oxford UP.
- Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech & Jan Svartvik. 1985. *A Comprehensive Grammar of the English Language*. New York: Longman.
- R Core Team. 2020a. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.
- R Core Team. 2020b. R Documentation: Model Formulae.
- Roig, Audrey. 2014. Quel mode de liaison dans les corrélatives isomorphes « plus...plus » et « autant...autant »? In *Actes du IVe CMLF*, vol. 8, 2533–2549. Berlin: SHS Web of Conferences.
- Roland, Douglas & Dan Jurafsky. 2002. Verb sense and verb subcategorization probabilities. In Suzanne Stevenson & Paola Merlo (eds.), *The Lexical Basis of Sentence Processing: Formal, Computational, and Experimental Issues*, 325–346. Amsterdam: John Benjamins.
- Rooy, Bertus van. 2014. Convergence and endonormativity at Phase 4 of the Dynamic Model. In Sarah Buschfeld, Thomas Hoffmann, Magnus Huber & Alexander Kautzsch (eds.), *The evolution of Englishes: The Dynamic Model and beyond*, 21–38. Amsterdam/Philadelphia: John Benjamins.
- Rooy, Bertus van & Lize Terblanche. 2010. Complexity in word-formation processes in new varieties of South African English. *Southern African Linguistics and Applied Language Studies* 28(4). 357–374.
- Ross, John Robert. 1967. *Constraints on Variables in Syntax*. MIT: PhD Thesis.
- RStudio Team. 2020. RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL. <http://www.rstudio.com/>.
- Sag, Ivan A. 2010. English Filler-Gap Constructions. *Language* 86(3). 486–545.
- Sánchez López, Cristina. 2009. Las correlaciones comparativas de proporcionalidad en español. *Boletín de la Real Academia Española* LXXXIX(CCXCIX). 161–192.

- Sánchez López, Cristina. 2014. The left periphery of Spanish comparative correlatives. In Andreas Dufter & Álvaro S. Octavio de Toledo (eds.), *Left Sentence Peripheries in Spanish: Diachronic, Variationist and Comparative Perspectives*, vol. 214, 155–183. Amsterdam: John Benjamins.
- Sánchez López, Cristina. 2017. Coordination and correlatives. In Andreas Dufter & Elisabeth Stark (eds.), *Manual of Romance Morphosyntax and Syntax*, 647–690. Berlin: De Gruyter Mouton.
- Saussure, Ferdinand de. 1916. *Cours de linguistique générale*. Paris: Payot.
- Schmid, Hans-Jörg. 2000. *English abstract nouns as conceptual shells: From corpus to cognition*. Berlin: Mouton de Gruyter.
- Schmid, Hans-Jörg. 2016. A Framework for Understanding Linguistic Entrenchment and Its Psychological Foundations. In Hans-Jörg Schmid (ed.), *Entrenchment and the Psychology of Language Learning: How We Reorganize and Adapt Linguistic Knowledge*, 9–35. Berlin, Boston: De Gruyter Mouton.
- Schmid, Hans-Jörg & Helmut Küchenhoff. 2013. Collostructional analysis and other ways of measuring lexicogrammatical attraction: theoretical premises, practical problems and cognitive underpinnings. *Cognitive Linguistics* 24(3). 531–577.
- Schneider, Edgar W. 2003. The Dynamics of New Englishes: From Identity Construction to Dialect Birth. *Language* 79(2). 233–281.
- Schneider, Edgar W. 2007. *Postcolonial English: Varieties of English around the World*. Cambridge: Cambridge UP.
- Schneider, Edgar W. 2011. *English around the world: an introduction* (Cambridge Introductions to the English Language). Cambridge: Cambridge UP.
- Schneider, Edgar W. 2014. New Reflections on the Evolutionary Dynamics of World Englishes. *World Englishes* 33(1). 9–32.
- Schneider, Edgar W. 2020. South Africa in the Linguistic Modeling of World Englishes. In Raymond Hickey (ed.), *English in Multilingual South Africa: The Linguistics of Contact and Change* (Studies in English Language), 16–29. Cambridge: Cambridge UP.
- Schütze, Carson T. 1996. *The Empirical Base of Linguistics: Grammaticality Judgements and Linguistic Methodology*. Chicago: University of Chicago Press.
- Seoane, Elena & Cristina Suárez-Gómez (eds.). 2016. *World Englishes: New Theoretical and Methodological Considerations*. Amsterdam/Philadelphia: Benjamins.
- Sinclair, John. 1996. EAGLES Preliminary Recommendations on Text Typology. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.28.1988&rep=rep1&type=pdf> (31 August, 2020).
- Singapore Ministry of Education. 2010. Dominant Home Language of Chinese Pri-1 Students (1980 to 2009). <https://www.nas.gov.sg/archivesonline/data/pdfdoc/20090324003/smc%20appendix%20-%20dominant%20home%20language%20of%20chinese%20pri-one%20students.pdf> (10 July, 2021).

- Singmann, Henrik, Ben Bolker, Jake Westfall, Frederik Aust & Mattan S. Ben-Shachar. 2016. afex: Analysis of factorial experiments. R package version 0.28-1. <https://CRAN.R-project.org/package=afex>.
- Spencer, Brenda. 2011a. International sporting events in South Africa, identity re-alignment, and Schneider's EVENT X. *African Identities: Ways with Soccer in Africa* 9(3). 267–278.
- Spencer, Brenda. 2011b. Linguistic penetration at Schneider's Phase 4: Acceptability ratings of entrenched features of Black South African English by South Africans outside the originating culture of the variety. *Journal for Language Teaching* 45(2). 133–149.
- Speyer, Augustin. 2011. Je stärker der Fokus, desto geringer die Einbettung? Zum Status des *je*-Satzes in *je-desto*-Gefügen. *Linguistische Berichte* 225. 43–61.
- Stefanowitsch, Anatol & Susanne Flach. 2017. The corpus-based perspective on entrenchment. In Hans-Jörg Schmid (ed.), *Entrenchment and the psychology of language learning: How we reorganize and adapt linguistic knowledge*, 101–127. Berlin: De Gruyter.
- Stefanowitsch, Anatol & Stefan Th. Gries. 2003. Collostructions: Investigating the interaction of words and constructions. *International Journal of Corpus Linguistics* 8(2). 209–243.
- Stefanowitsch, Anatol & Stefan Th. Gries. 2005. Covarying Collexemes. *Corpus Linguistics and Linguistic Theory* 1(1). 1–43.
- Sudhoff, Stefan. 2010. *Focus Particles in German: Syntax, Prosody, and Information Structure* (Linguistik Aktuell/Linguistics Today 151). Amsterdam: John Benjamins.
- Szmrecsányi, Benedikt, Jason Grafmiller, Benedikt Heller & Melanie Röthlisberger. 2016. Around the world in three alternations: Modelling syntactic variation in varieties of English. *English World-Wide* 37. 109–137.
- Taylor, Heather. 2004. Interclausal (co)dependency: the case of the comparative correlative. Unpublished manuscript. University of Michigan – Flint.
- Taylor, Heather. 2009. The syntactically well-behaved comparative correlative. In José M. Brucart, Anna Gavarró & Jaume Solà (eds.), *Merging Features: Computation, Interpretation, and Acquisition*, 254–275. Oxford: Oxford UP.
- Taylor, John R. 2002. *Cognitive Grammar*. Oxford: Oxford UP.
- Traugott, Elizabeth & Graeme Trousdale. 2013. *Constructionalization and Constructional Changes* (Oxford Studies in Diachronic & Historical Linguistics 6). Oxford: Oxford UP.
- Trudgill, Peter. 2000. *Sociolinguistics: An Introduction to Language and Society*. 4th edition. London: Penguin Books.
- Trudgill, Peter. 2003. *A glossary of sociolinguistics*. Oxford: Oxford UP.
- United States Central Intelligence Agency. 2001. North America. Washington, D.C.: Library of Congress Geography and Map Division. <https://www.loc.gov/item/2002622295/> (18 August, 2021).
- Wagenmakers, Eric-Jan & Simon Farrell. 2004. AIC model selection using Akaike weights. *Psychonomic Bulletin & Review* 11(1). 192–196.

- Wee, Lionel. 2008a. Singapore English: phonology. In *Varieties of English: Africa, South and Southeast Asia* (Varieties of English), vol. 4, 259–277. Berlin; New York: Mouton de Gruyter.
- Wee, Lionel. 2008b. Singapore English: morphology and syntax. In Rajend Mesthrie (ed.), *Varieties of English: Africa, South and Southeast Asia* (Varieties of English), vol. 4, 593–609. Berlin; New York: Mouton de Gruyter.
- Whittingham, Mark J., Philip A. Stephens, Richard B. Bradbury & Robert P. Freckleton. 2006. Why Do We Still Use Stepwise Modelling in Ecology and Behaviour? *Journal of Animal Ecology* 75(5). 1182–1189.
- Wickham, Hadley. 2016. *ggplot2: Elegant Graphics for Data Analysis*. New York: Springer. <https://ggplot2.tidyverse.org>.
- Winter, Bodo. 2020. *Statistics for Linguists: An Introduction Using R*. New York and London: Routledge.
- Wit, Frederik de. 1660. *Nova totius Americae descriptio*. Washington, D.C.: Library of Congress Geography and Map Division. <https://www.loc.gov/item/99446136/> (18 August, 2021).
- Woods, Anthony, Paul Fletcher & Arthur Hughes. 1986. *Statistics in Language Studies*. Cambridge: Cambridge UP.
- Zeldes, Amir. 2013. Productive argument selection: Is lexical semantics enough? *Corpus Linguistics and Linguistic Theory* 9(2). 263–291.
- Zhan, Fangqiong & Elizabeth Closs Traugott. 2020. A study of the development of the Chinese comparative correlative construction from the perspective of constructionalization. *Diachronica* 37(1). 83–126.
- Ziem, Alexander & Johanna Flick. 2019. Constructicography at work: implementation and application of the German Constructicon. *Yearbook of the German Cognitive Linguistics Association* 7(1). 201–214.