

DISSERTATION

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Status Dynamics and Their Effects on Individual Cooperation and Performance in Interdependent Teams

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Overview

| | |
|--|------------|
| Table of Contents | V |
| List of Tables..... | VIII |
| List of Figures | XI |
| List of Abbreviations..... | XII |
| List of Symbols | XIV |
| | |
| 1. Introduction | 1 |
| | |
| 2. Paper I – Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance | 12 |
| | |
| 3. Paper II – Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams..... | 71 |
| | |
| 4. Paper III – Status as Insurance against Short-Term Performance Fluctuations and Long-Term Performance Decay | 105 |
| | |
| 5. Overall Concluding Thoughts..... | 144 |
| | |
| References | 151 |
| Appendix | 161 |

Table of Contents

| | |
|--|-------------|
| List of Tables..... | VIII |
| Main Section | VIII |
| Appendix | IX |
| | |
| List of Figures | XI |
| Main Section | XI |
| Appendix | XI |
| | |
| List of Abbreviations..... | XII |
| | |
| List of Symbols | XIV |
| | |
| 1. Introduction | 1 |
| 1.1 Background and Motivation..... | 1 |
| 1.2 Research Questions and Theoretical Relevance..... | 3 |
| 1.3 Research Approach and Dataset..... | 6 |
| 1.4 Outline and Abstracts | 8 |
| 1.4.1 Outline..... | 8 |
| 1.4.2 Paper I – Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance..... | 9 |
| 1.4.3 Paper II – Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams | 10 |
| 1.4.4 Paper III – Status as Insurance against Short-Term Performance Fluctuations and Long-Term Performance Decay..... | 11 |
| | |
| 2. Paper I – Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance | 12 |
| 2.1 Introduction | 12 |
| 2.2 Theoretical Background | 14 |
| 2.2.1 Status and Status Conflicts | 15 |
| 2.2.2 Superstar Entry and Status Conflicts..... | 16 |
| 2.3 Hypotheses | 18 |
| 2.3.1 Cooperation | 18 |

Table of Contents

| | |
|--|-----------|
| 2.3.2 Effort | 22 |
| 2.3.3 Performance | 25 |
| 2.4 Methods | 28 |
| 2.4.1 Research Setting | 28 |
| 2.4.2 Sample | 30 |
| 2.4.3 Dependent Variables | 31 |
| 2.4.4 Independent Variables | 34 |
| 2.4.5 Control Variables | 39 |
| 2.4.6 Model Specification | 40 |
| 2.5 Results | 41 |
| 2.5.1 Cooperation | 42 |
| 2.5.2 Effort | 47 |
| 2.5.3 Performance | 54 |
| 2.6 Discussion | 58 |
| 2.6.1 Theoretical Implications..... | 59 |
| 2.6.2 Limitations | 65 |
| 2.6.3 Practical Implications | 68 |
| 2.7 Conclusion..... | 70 |
| | |
| 3. Paper II – Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams..... | 71 |
| 3.1 Introduction | 71 |
| 3.2 Theoretical Background | 74 |
| 3.2.1 Established Theoretical Perspectives | 75 |
| 3.2.2 Status Theory and Pay Variation..... | 78 |
| 3.3 Hypotheses | 79 |
| 3.4 Methods | 86 |
| 3.4.1 Research Setting and Sample | 86 |
| 3.4.2 Dependent Variables | 87 |
| 3.4.3 Independent Variables..... | 89 |
| 3.4.4 Control Variables and Model Specification | 91 |
| 3.5 Results | 92 |
| 3.6 Discussion | 99 |
| 3.6.1 Theoretical Implications..... | 99 |
| 3.6.2 Limitations | 101 |
| 3.6.3 Practical Implications | 103 |
| 3.7 Conclusion..... | 104 |

| | |
|---|------------|
| 4. Paper III – Status as Insurance against Short-Term Performance Fluctuations and Long-Term Performance Decay | 105 |
| 4.1 Introduction | 105 |
| 4.2 Theoretical Background | 108 |
| 4.2.1 Status | 108 |
| 4.2.2 Status Reinforcement | 109 |
| 4.2.3 Status Loss Aversion | 111 |
| 4.3 Hypotheses | 113 |
| 4.3.1 Short Term..... | 113 |
| 4.3.2 Long Term..... | 116 |
| 4.4 Methods | 119 |
| 4.4.1 Research Setting and Sample | 119 |
| 4.4.2 Dependent Variables | 121 |
| 4.4.3 Independent Variables..... | 123 |
| 4.4.4 Control Variables | 126 |
| 4.4.5 Model Specification | 128 |
| 4.5 Results | 128 |
| 4.5.1 Short Term..... | 128 |
| 4.5.2 Long Term..... | 132 |
| 4.6 Discussion | 137 |
| 4.6.1 Theoretical Implications..... | 138 |
| 4.6.2 Limitations | 139 |
| 4.6.3 Practical Implications..... | 141 |
| 4.7 Conclusion..... | 143 |
| | |
| 5. Overall Concluding Thoughts..... | 144 |
| 5.1 Findings Summary | 144 |
| 5.2 Research Contribution and Future Directions | 148 |
| | |
| References | 151 |
| | |
| Appendix | 161 |
| Appendix A: Additional Analyses | 161 |
| Appendix B: Exemplary Experimental Setup | 172 |

List of Tables

Main Section

| | |
|---|----|
| Table 1: Variable Descriptions..... | 33 |
| Table 2: Dependent Variables in Detail | 34 |
| Table 3: Variable Correlations | 42 |
| Table 4: Results of Regression Analyses Testing Effects of Status on <i>Cooperativeness</i> | 43 |
| Table 5: Results of Regression Analyses Testing Short-Term (30 Days) Effects of Status on <i>Cooperativeness</i> | 44 |
| Table 6: Results of Regression Analyses Testing Effects of Skill Complementarity on <i>Cooperativeness</i> | 45 |
| Table 7: Details on Effects of <i>Position Overlap</i> on <i>Cooperativeness</i> | 47 |
| Table 8: Results of Regression Analyses Testing Short-Term (30/15 Days) Effects of Status on <i>Effort</i> | 48 |
| Table 9: Results of Alternative Regression Analyses Testing Short-Term (30 Days) Effects of Status on <i>Effort</i> | 49 |
| Table 10: Results of Regression Analyses Testing Long-Term (> 30 Days) Effects of Status on <i>Effort</i> | 51 |
| Table 11: Results of Regression Analyses Testing Effects of <i>Position Overlap</i> on <i>Effort</i> | 52 |
| Table 12: Details on Effects of <i>Position Overlap</i> on <i>Effort</i> (Main Effects Only) | 52 |
| Table 13: Results of Regression Analyses Testing Effects of <i>Height Differential</i> on <i>Effort</i> ... | 53 |
| Table 14: Results of Regression Analyses Testing Effects of Status on <i>Efficiency</i> | 54 |
| Table 15: Results of Regression Analyses Testing Effects of Skill Complementarity on <i>Efficiency</i> | 55 |
| Table 16: Details on Effects of Status on <i>Efficiency</i> | 56 |

List of Tables

| | |
|--|-----|
| Table 17: Results of Alternative Regression Analyses Testing Effects of Status on <i>Efficiency</i> | 57 |
| Table 18: Variable Descriptions..... | 88 |
| Table 19: Variable Correlations | 91 |
| Table 20: Results of Regression Analyses Testing Effects of Pay Variation on <i>Assists per Game</i> | 93 |
| Table 21: Results of Regression Analyses Testing Effects of Pay Variation on <i>Efficiency per Game</i> | 95 |
| Table 22: Results of Regression Analyses Testing Effects of <i>Delta Pay Variation</i> on <i>Assists per Game</i> | 97 |
| Table 23: Results of Regression Analyses Testing Effects of <i>Delta Pay Variation</i> on <i>Efficiency per Game</i> | 98 |
| Table 24: Short-Term Variable Descriptions | 122 |
| Table 25: Long-Term Variable Descriptions | 123 |
| Table 26: Short-Term Variable Correlations | 129 |
| Table 27: Results of Regression Analyses Testing Effects of Recent Performance and Status on Opportunities to Perform..... | 130 |
| Table 28: Long-Term Variable Correlations..... | 132 |
| Table 29: Results of Probit Analyses Testing Effects of Performance and Previously Awarded Status on Newly Awarded Status | 133 |
| Table 30: Results of Probit Analyses Testing Effects of Performance and Previously Awarded Status on Newly Awarded Status in Different Age Groups..... | 136 |

Appendix

| | |
|--|-----|
| Table A-1: Additional Variable Descriptions | 161 |
| Table A-2: Results of Additional Regression Analyses Testing Effects of Status on <i>Cooperativeness</i> | 161 |
| Table A-3: Results of Regression Analyses Testing Effects of <i>Relative Pay</i> on <i>Assists</i> | 162 |

List of Tables

| | |
|---|-----|
| Table A-4: Results of Regression Analyses Testing Effects of <i>Relative Pay</i> on <i>Field Goals Missed</i> | 163 |
| Table A-5: Results of Regression Analyses Testing Effects of <i>Relative Pay</i> on <i>Field Goal Attempts</i> | 164 |
| Table A-6: Details on Effects of <i>Position Overlap</i> on <i>Assists</i> | 165 |
| Table A-7: Details on Effects of <i>Position Overlap</i> on <i>Field Goals Missed</i> | 166 |
| Table A-8: Details on Effects of <i>Position Overlap</i> on <i>Field Goal Attempts</i> | 167 |
| Table A-9: Details on Effects of <i>Position Overlap</i> on <i>Shooting Precision</i> | 168 |
| Table A-10: Base Models for Regression Analyses Testing Effects of <i>Position Overlap</i> on <i>Effort</i> | 169 |
| Table A-11: Additional Variable Descriptions | 170 |
| Table A-12: Results of Alternative Regression Analyses Testing Effects of Pay Variation on <i>Assists per Game</i> | 170 |
| Table A-13: Results of Alternative Regression Analyses Testing Effects of Pay Variation on <i>Efficiency per Game</i> | 171 |

List of Figures

Main Section

| | |
|---|-----|
| Figure 1: Structure of the Dissertation | 9 |
| Figure 2: Overview of Hypotheses..... | 28 |
| Figure 3: Exemplary Position Overlap Constellations | 38 |
| Figure 4: Short-Term Fluctuations in <i>Effort</i> as a Function of <i>Relative Pay</i> in the Superstar Entry Scenario | 50 |
| Figure 5. Full-Season Development of <i>Efficiency</i> as a Function of Status | 58 |
| Figure 6: Types of Status Conflicts at Different Levels of Member Status and Skill Complementarity | 62 |
| Figure 7: The Link between <i>Pay Range</i> and <i>Assists per Game</i> | 94 |
| Figure 8: The Link between <i>Pay Range</i> and <i>Efficiency per Game</i> | 96 |
| Figure 9: The Link between Recent Performance and Opportunities to Perform for Different Status Levels | 131 |
| Figure 10: The Link between Performance and Newly Awarded Status for Different Levels of Previously Awarded Status | 135 |
| Figure 11: Summary of Major Findings..... | 147 |

Appendix

| | |
|---|-----|
| Figure A-1: Pay-Off per Player as a Function of Each Player's Choice of Strategy..... | 174 |
| Figure A-2: Exemplary Display of Standings after First Set | 175 |
| Figure A-3: Exemplary Display of Standings before Start of Second Set (Treatment Group) | 176 |

List of Abbreviations

| | |
|--------|--|
| AST | assists |
| BAA | Basketball Association of America |
| BLK | blocks |
| C | center |
| CBA | collective bargaining agreement |
| CEO | chief executive officer |
| cf. | compare (Latin: 'confer') |
| cons. | consecutive |
| CSM | Center for Sports and Management |
| CV | curriculum vitae |
| DID | difference-in-differences |
| e.g. | for example (Latin: 'exempli gratia') |
| et al. | and others (Latin: 'et alii/aliae') |
| FGLS | feasible generalized least squares |
| FGM | field goals missed |
| FTM | free-throws missed |
| HR | human resources |
| i.e. | that is (Latin: 'id est') |
| ibid. | as cited immediately before (Latin: 'ibidem') |
| IT | information technology |
| lin. | linear |
| MLB | Major League Baseball |
| Mn | million(s) |
| Mr. | Mister |
| MVP | Most Valuable Player |
| NASCAR | National Association for Stock Car Auto Racing |
| NBA | National Basketball Association |
| NBL | National Basketball League |

List of Abbreviations

| | |
|-------|--|
| NFL | National Football League |
| NHL | National Hockey League |
| No. | number |
| OLS | ordinary least squares |
| p. | page |
| PG | point guard |
| PF | power forward |
| Pos. | position |
| Pr | probability |
| PT | points scored |
| R^2 | coefficient of determination |
| REB | rebounds (offensive and defensive) |
| SD | standard deviation |
| SF | small forward |
| SG | shooting guard |
| squ. | squared |
| STL | steals |
| TOV | turnovers |
| USD | United States Dollar |
| vs | versus |
| WHU | Wissenschaftliche Hochschule für Unternehmensführung |

List of Symbols

| | |
|----------|--------------------|
| % | percent |
| * | probability < 0.10 |
| ** | probability < 0.05 |
| *** | probability < 0.01 |
| Δ | delta |
| Σ | sum |

1. Introduction

1.1 Background and Motivation

Social hierarchy, i.e. a rank order of individuals based on collectively valued characteristics, is “an unavoidable reality of group life” (Bunderson et al. 2016: p. 1265) – “it is never absent, inevitably emerging both between and within groups” (Magee and Galinsky 2008: p. 352). As a consequence, status, i.e. an individual’s relative position within this explicit or implicit rank order, is a ubiquitous phenomenon and its differential distribution among individuals “a defining feature of organizations” (Fragale et al. 2012: p. 373).

Despite the undisputed relevance of individual status for teams in businesses and other organizations, our theoretical understanding of its drivers and effects remains fragmentary, which I trace back to three main challenges that status research is faced with. First, status is a perceptual and thus inherently complex phenomenon. It is granted to individuals based on their value contributions to the group they belong to as perceived by other members (Bunderson and Reagans 2011, Piazza and Castellucci 2014), who have been argued to emphasize competence and commitment to the team (Anderson and Kilduff 2009a). However, neither of these two criteria is unambiguously defined or objectively assessable, nor are they jointly exhaustive. Instead, evaluations of relative value contributions are collectively construed based on heuristics that rely on a wide array of cues ranging from education backgrounds and awards to the prestige of affiliates and previous employers (Ertug and Castellucci 2013), which renders a description of the drivers of status cumbersome. Likewise, the effects of possessing high status comprise a multitude of both individual – e.g., greater access to resources and freedom to act (Bendersky and Hays 2012, Bothner et al. 2012) – and relational implications – e.g., high-status entities being able to extract higher levels of effort from lower-status affiliates (Castellucci and

Ertug 2010). In sum, status has been found to affect a wide range of organizational issues in a plethora of forms and facets, which complicates the formation of one integrated theory of status.

Second, status is an innately dynamic phenomenon. Even though research has increasingly applied longitudinal approaches to do the topic justice, their full potential has yet to be exploited. Many of the landmark studies that have advanced our understanding of status and its implications for organizational behavior have either solely focused on the end product that a group of individuals delivered without detailed insights into how that end product was developed (e.g., Groysberg et al. 2011) or have relied on experimental laboratory settings that do not allow status dynamics to unfold over extended periods of time (e.g., Bendersky and Shah 2012). As a result, the processes and behaviors that underlie the emergence, reinforcement, and institutionalization of status hierarchies, which “have been among the most hotly debated and problematic issues within this field of research” (Piazza and Castellucci 2014: p. 309) over the last two decades, remain largely obscure.

Finally, status and its behavioral implications are difficult to measure. Not only do multiple, partially conflicting definitions of status exist (Piazza and Castellucci 2014), but rank orders on the inside may also look quite different from what is observable to outsiders (Overbeck et al. 2005). Likewise, individual cooperation, the main lever through which status inequalities affect collective outcomes, has frequently been approximated by overarching measures of individual performance for lack of access to detailed data about actual individual behavior (Fredrickson et al. 2010, Siegel and Hambrick 2005). The resulting different measurement approaches may have contributed to the partially conflicting findings that research has generated and may thus have impeded the development of a unified theoretical understanding of status.

While entirely dispelling these issues within the limits of this dissertation would certainly be presumptuous, my objective is to help extend our understanding of the status phenomenon and

to offer possible avenues to overcome the challenges associated with it for future research. I will do so by focusing on both selected drivers and effects of status in separate empirical analyses. In the process, I will concentrate on incidents and conditions that nurture changes in the social hierarchies of the groups in focus and examine various time horizons ranging from only a few weeks to the entirety of a professional career in order to do justice to the dynamic nature of status. In light of the increasing predominance of interdependent teams, i.e. teams whose members need to coordinate their efforts to complete their respective tasks (Tauer and Harackiewicz 2004), as the manner in which work is distributed and organized in businesses and other organizations (Lazear and Shaw 2007), I will exclusively deal with such teams. What is more, throughout this dissertation the level of analysis will be that of the individual team member, which I believe to provide both the most profound theoretical insights and the most relevant implications for practitioners in leadership positions and HR functions.

Taking all of the above into consideration, by means of this dissertation I hope to contribute to answering the fundamental question: *how do status dynamics emerge and affect individual-level behavior in interdependent teams?*

1.2 Research Questions and Theoretical Relevance

This overarching theme can be divided into three separate research topics, the first two of which deal with the effects of status-related phenomena for individual cooperation and performance: First, I will examine individual behavioral responses to a change in team composition that breaks up the existing social hierarchy and triggers the formation of a new one. Second, I will analyze the effects of horizontal pay variation as a dynamic team characteristic on individual cooperation and performance from a status theory perspective. The third topic focuses on the self-reinforcing nature of status and its insurance-like function against the negative

consequences of underperformance over the short and long terms. The three topics can be described by one research questions each. These are:

Question I: How does an exogenous shock to a team's social hierarchy – the addition of a superstar – affect individual cooperation and performance?

Question II: How does horizontal pay variation affect individual cooperation and performance?

Question III: To what extent does high status protect its possessors from the negative consequences of short-term performance fluctuations and long-term performance decay?

The theoretical relevance of Question I stems from the fact that, to date, status research has almost exclusively focused on collectives whose composition did not change significantly during the observation period. It has either dealt with previously existing teams that already possessed quite a stable hierarchy for lack of unexpected exogenous events (Bothner et al. 2012, Castellucci and Ertug 2010, Fragale et al. 2012); or it was concerned with teams newly established for the purpose of experimental investigation, whose hierarchies were emergent and, thus, subject to a steady development rather than to sudden and major ruptures (Anderson et al. 2012, Askin and Bothner 2016, Bendersky and Hays 2012, Bunderson et al. 2016). Only a few studies have dealt with superstars, i.e. high-income, high-status individuals that “dominate the activities in which they engage” (Rosen 1981: p. 854), migrating from one organizational setting to another (Groysberg et al. 2008, Groysberg and Lee 2009). However, these have mostly focused on the human capital implications of such a transfer for the superstar alone, leaving the wider implications for the receiving collective largely aside. By concentrating on the exogenous shock to the team's social hierarchy caused by such a transfer, this study will

be the first – to my knowledge – to analyze the implications of a significant change in team composition for a team’s social hierarchy and the resulting individual-level immediate reactions and long-term behavioral adaptations. Given how common team composition changes are both in businesses and other organizations, incorporating this element into status research appears essential going forward.

Question II is certainly not new to the scientific community, as pay variation research – based on both equity and expectancy theories as the two dominant behavioral theories (Brown et al. 2003, Cowherd and Levine 1992, Fredrickson et al. 2010), as well as on tournament theory as the dominant economic theory (Becker and Huselid 1992, Bloom and Michel 2002, Lazear and Rosen 1981) – has already created profound insights over the last decades. Despite comprehensive and continued efforts, however, not all conflicting findings both between and within the three theoretical perspectives as to whether pay variation positively or negatively affects cooperation and performance have been reconciled yet (Downes and Choi 2014, Gupta et al. 2012), which makes the issue as theoretically relevant as ever. By complementing the established theoretical perspectives applied in the analysis of horizontal pay variation with the predictions of status theory, which have to the best of my knowledge not been incorporated into the discussion yet, in a comparative empirical study, I hope to make a relevant contribution to resolving some of the contradictions that persist in pay variation research.

Question III is of theoretical relevance to the fundamental issue of why individuals generally strive for high-status positions in the collectives they are members of in the first place (Huberman et al. 2004), for the sake of which they have been found to be even willing to forego material rewards (Frank 1984). A wide range of material and non-material benefits of possessing high status have been discussed in the literature, such as more positive performance expectations and evaluations, better access to resources, higher self-efficacy, enhanced freedom

to act, and the intrinsic value of high status with respect to favorable social comparisons itself (Bendersky and Shah 2012, Bothner et al. 2012, Groysberg et al. 2011, Kilduff and Galinsky 2013, Main et al. 1993). To complete the overall picture, I will focus on the self-reinforcing nature of status (Magee and Galinsky 2008), which I argue can protect individuals from losing status and the benefits associated with it in cases of both short-term performance fluctuations and long-term performance decay. This insurance-like feature of status, which may bear particular relevance to its possessors based on the predictions of Prospect Theory regarding loss aversion (Kahneman and Tversky 1979, 1984, Pettit et al. 2010, Bothner et al. 2007), has not yet been the focus of targeted scientific scrutiny. Thus, by specifically addressing Question III, I hope to further advance our understanding of the benefits associated with possessing high status, of how status is awarded in consideration of both performance developments and previously awarded status, and, ultimately, of why the pursuit of high status appears to be a universal feature of human interactions.

1.3 Research Approach and Dataset

While all three research questions contribute to my overarching objective of enhancing our understanding of the drivers and effects of status dynamics in interdependent teams, each of them is sufficiently delimited to not only justify, but necessitate discrete investigation. Accordingly, they will be addressed in one empirical stand-alone paper each.

All three papers use a unique large-scale dataset that comprises comprehensive demographic and performance-related data on 668,680 game appearances¹ of 2,137 players in the National Basketball Association (NBA) over a thirty-year period between the 1985/86 and 2014/15

¹ Not all three papers, however, make use of the entire dataset, as some analyses required including additional metrics that were not available for all 668,680 observations.

seasons, including both regular-season and playoff games. It was compiled from <http://www.basketball-reference.com/> between July and November 2015 using Stata 13² and includes all performance metrics commonly used in the world's most prestigious basketball league. The data were analyzed with a variety of statistical methods, including descriptive analyses, pairwise correlation analyses, multiple linear regression, unbalanced panel regression, and probit models.

Sports – and basketball in particular – provide three primary benefits that have contributed to their establishment as a fertile research setting for organizational and behavioral issues, as a wide range of influential studies shows (e.g., Berman et al. 2002, Kilduff et al. 2010, Bothner et al. 2007, Bothner et al. 2012, Castellucci and Ertug 2010, Frey et al. 2013, Bloom 1999, Trevor et al. 2012). First, sports teams have been argued to allow drawing implications for a wide range of other organizational settings (Berman et al. 2002), most notably business, with which they share a range of important characteristics, such as “their mutual concern for competing externally, cooperating internally, managing human resources strategically, and developing appropriate systems and structures” (p. 17). Basketball in particular is considered to require the highest level of coordination among players of all globally relevant team sports (Keidel 1987) and thus allows to derive accurate predictions about behaviors and interactions in teams at large, which have become ever more relevant across all organizational settings (Lazear and Shaw 2007).

Second, as opposed to other organizations, sports provide a controlled ‘laboratory-like’ setting: all players are faced with the same collective objectives and must comply with the same rules,

² I would like to again express my gratitude to Ho-Fai Chan, without whose unheard-of IT skills collecting the raw data would not have been possible, let alone within such a short period of time.

which takes away some of the noise associated with observing behavior and measuring performance in other organizations (Frey et al. 2013).

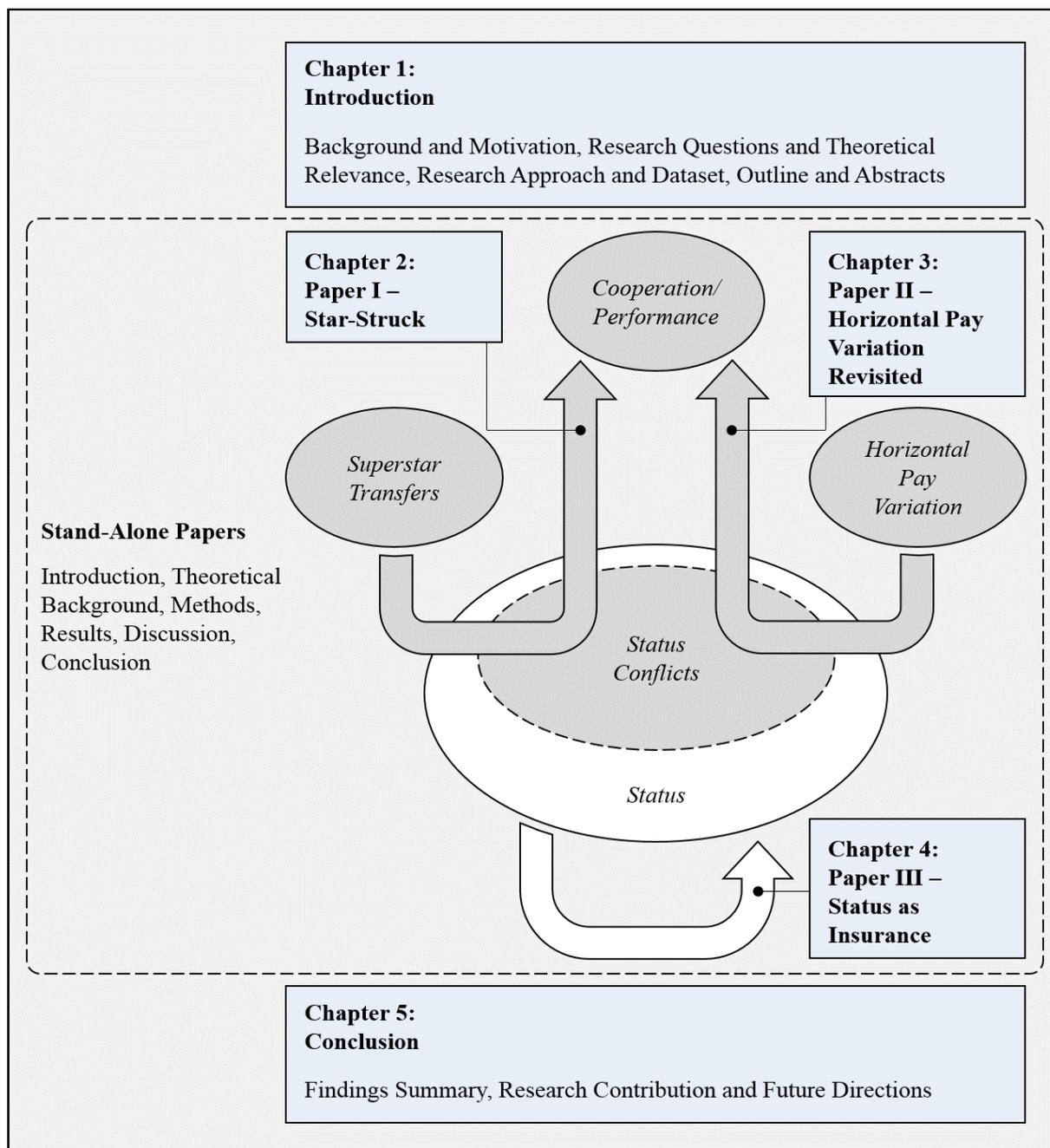
Finally, a wide array of objective and accurate demographic, income- and performance-related data are collected by the media and dedicated sports data enterprises that allow detailed analyses of individual behaviors. In other words, “[t]here is no research setting other than sports where we know the name, face, and life history of every production worker and supervisor in the industry” (Kahn 2000: p. 75) and where “compensation packages and performance statistics for each individual are widely available” (ibid.). In basketball more specifically, the limited field and team sizes of only five a side result in all players on the field being almost continually engaged in either offensive or defensive tasks, allowing virtually seamless coverage of all their actions. In sum, I am therefore convinced that the basketball setting will allow me to generate valuable scientific insights without compromising their external validity for other organizational conditions.

1.4 Outline and Abstracts

1.4.1 Outline

This dissertation comprises five chapters as described in Figure 1. After this introductory section, chapters two, three, and four consist of one empirical stand-alone paper each, of which each addresses one of the research questions outlined above and each is structured according to the principles of academic journals with independent introduction, theory, methods, results, and discussion segments. Chapter five then summarizes the findings of all three papers, highlights the central research contributions of this dissertation, and suggests avenues for further research.

Figure 1: Structure of the Dissertation



While I am the single author of the three papers, all of them build on the constructive feedback and helpful suggestions by my first supervisor, Prof. Dr. Sascha L. Schmidt, my second supervisor, Prof. Dr. Jochen Menges, as well as Prof. Dr. Benno Torgler and Jun.-Prof. Dr. Dominik Schreyer. Below, a short abstract for each of the three stand-alone empirical papers

will provide a summary of their objectives, approaches, and key findings, before Paper I is developed in greater detail in chapter two.

1.4.2 Paper I – Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance

In Paper I, I examine how team members respond to a profound change in team composition – namely, a so-called superstar joining the team – in terms of their cooperation, effort, and performance as a function of their status positions within the group and the complementarity of their skill-sets with that of the newcomer. I find that those teammates who are very similar to the star tend to temporarily engage in overt status conflict and reduce cooperation, while moderately similar teammates increase cooperation to enhance their perceived value to the team in covert status conflicts. Very similar teammates' effort is positively affected, but only in the first few weeks after the transfer, and sustainable performance enhancements are limited to the highest-status individuals. These findings have significant implications for the theories of team composition and status as well as for HR practitioners' hiring and staffing decisions.

1.4.3 Paper II – Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams

In Paper II, I analyze the effects of horizontal pay variation on individual-level cooperation and performance by contrasting established arguments based on equity and expectancy theories with those of status theory, which has not yet been considered in pay variation research. In line with the latter, I find a U-shaped relationship between horizontal pay variation and cooperation as well as performance. Increases in horizontal pay variation positively affect both cooperation and performance. The results suggest that large intra-team pay differentials may facilitate the assignment of resources and responsibilities, and thus enhance organizational outcomes. Future

research must consider status theory along with more traditional theories to do justice to the inherent complexity of the pay variation phenomenon.

1.4.4 Paper III – Status as Insurance against Short-Term Performance Fluctuations and Long-Term Performance Decay

In Paper III, I examine how possessing high status insures individuals in teams against the consequences of short-term performance fluctuations and long-term performance decay. With respect to the short term, I find that the opportunities to perform that high-status individuals receive depend less on their recent performance compared to those that low-status individuals receive, even though the former are not generally given more opportunities to perform than the latter. In the long term, the performance level required to be awarded high status in a given period declines with the number of times that high status has been awarded in previous periods, which becomes a more meaningful predictor of newly awarded high status than performance towards the end of a professional career. My results complement the current research on the benefits of status and bear significant implications for the design of promotion and other HR policies in organizations.

2. Paper I – Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance³

2.1 Introduction

The Avengers, Miracle, or The Lord of the Rings – the stories that Hollywood loves: a team of the best and greatest is assembled to achieve a collectively meaningful objective. As the plot develops, the team falls short of its potential with egos and individual interests making members withdraw or seek single-handed action. Facing defeat, our heroes get a grip of themselves just in time for the grand finale and emerge victorious thanks to paragon joint efforts.

In the real world, too, businesses and other organizations attempt to compose teams of high-performing individuals as a source of competitive advantage in an increasingly information- and knowledge-driven marketplace (Groysberg et al. 2008). Their intuitive reasoning is that the higher the individual performance potentials of the team members are, the higher the team's collective performance output will be.

However, like in the movies, these teams frequently fail to meet expectations. The main reason is that high-status individual performers may have difficulties working productively with others like themselves (Overbeck et al. 2005), particularly when the overall density of high-status individuals in the team is high (Groysberg et al. 2011, Swaab et al. 2014). Rather than sharing resources and making joint decisions towards the common goal, they may tend to focus their

³ Eberhard, K. 2016a. Star-Struck: How Changing the Team Composition by Adding a Superstar Affects Individual-Level Cooperation, Effort, and Performance. Unpublished Working Paper.

efforts on improving their own standing within the team (Piazza and Castellucci 2014, Bendersky and Hays 2012, Bunderson and Reagans 2011).

In this paper, I develop and test hypotheses about individual team members' behavior in situations in which a so-called superstar – a high-income individual with a track record of extraordinary performance – joins the team. Such a change in team composition represents a sizeable shock to the team's social hierarchy and, thus, an extreme scenario of how competition for high positions within it may enflame. In so doing, I hope to contribute to the current state of research in two ways: First, I zero in on each individual team member's response to a superstar joining in terms of their cooperation, effort, and performance and differentiate them by their own individual status and the complementarity of their skill-sets with respect to that of the star. This emphasis adds another decidedly relevant layer to the valuable insights generated by previous studies: these have so far either focused exclusively on the performance of the superstar being transferred, which is found to decline in terms of subjective performance appraisals by both supervisors (Bidwell 2012) and customers (Groysberg et al. 2008) in the financial services industry; or they have examined the relationship between the density of high-status individuals and performance on the team – but not on the individual – level, identifying decreasing, and eventually negative, marginal effects on group effectiveness, both for sell-side equity research analysts (Groysberg et al. 2011) and in sports teams (Swaab et al. 2014).

Second, my longitudinal approach reflects the transient nature of social hierarchies that dynamically emerge over time and are subject to constant change. In so doing, I comply with calls for status research to focus “more explicitly on the consequences of significant status changes” (Askin and Bothner 2016: p. 241) rather than taking a given status distribution as granted. By examining the consequences of a shock to the team's social hierarchy in its immediate aftermath over bi-weekly and monthly time intervals rather than solely at an artificial

static ‘end point’ of team interaction, I add clarity to the nature of the repercussions a superstar entry has on the relationships between and behaviors of individual team members. More specifically, I reconcile two partially conflicting perspectives on how individuals compete for status by identifying and describing two types of status conflicts that involve different individuals. In addition, HR practitioners and managers in leadership positions may benefit from my insights into the extent to which different team members tend to respond to team composition changes in unproductive ways. Realistic predictions about team members’ immediate reactions and sustainable behavior adaptations can help them shape team configuration decisions as well as communication strategies and incentive systems to enhance team performance. Given that virtually all organizations strive to assemble the most talented people – albeit to varying extents – for their respective purposes, the value of these insights is not limited to specific industries, but applicable to all teams in which members interdependently work on tasks in pursuit of a joint objective.

The next section will sketch out the foundations that status theory provides for this piece of research, followed by my demonstrating the reasoning behind its hypotheses. Subsequently, I will provide empirical evidence in support of these hypotheses based on individual- and game-level performance data over a thirty-year period from the NBA, which combines a prime example of teamwork with visible superstars and an unmatched depth of data on individual-level behavior.

2.2 Theoretical Background

Before developing the hypotheses, I will briefly outline the state of research on two aspects to which I will refer back throughout this paper: one is status and status conflicts, the other is superstars.

2.2.1 Status and Status Conflicts

Status theory will be the theoretical lens through which I attempt to explain the disruptions caused by changes to a team's composition. I follow Piazza and Castellucci's (2014) definition of status as a "signal [of] the particular category that an individual or an organization occupies within a well-defined social hierarchy" (p. 287). A social hierarchy, in turn, is "an implicit or explicit rank order of individuals or groups with respect to a valued social dimension" (Magee and Galinsky 2008: p. 354). According to Anderson and Kilduff (2009a), two dimensions are predominantly valued by team members: competence and commitment to the team. It is important to note that "perceptions of value, rather than value itself, determine status" (Kilduff and Galinsky 2013: p. 817). Given that past performance serves as a both observable and reliable signal of these two dimensions in the majority of situations (Groysberg and Lee 2008), there is likely to be a strong link between past performance and status, despite limited agreement within the literature (cf. Ertug and Castellucci 2013).

As team members search for these signals and incorporate them into their behaviors, social hierarchies dynamically emerge in every group of individuals working on an interdependent task, be it through formal assignment of roles or autochthonously (Bendersky and Hays 2012). Hierarchies enhance group effectiveness by facilitating the assignment of resources and responsibilities (Overbeck et al. 2005), clarifying expectations (Halevy et al. 2012), as well as simplifying communication and decision-making (Groysberg et al. 2011).

As the social hierarchy emerges and continually gains rigidity, individuals tend to compete for a high rank in it to reap the associated benefits, including access to resources, more positive performance appraisals, and enhanced self-esteem (Bendersky and Hays 2012, Bendersky and Shah 2012, Bidwell 2012, Bothner et al. 2012). They primarily do so by increasing the apparent value they contribute to the group in terms of both competence and commitment through

generosity and support of others (Anderson and Kilduff 2009a, Bendersky and Shah 2012). On the other hand, Anderson et al. (2012) find that individuals who believe their contribution to the group to be minor infer that they are expected to occupy a low-status rank and tend to comply with that expectation.

When team members' relative positions are unclear, status conflicts, i.e. "disputes over people's relative status positions in their group's social hierarchy" (Bendersky and Hays 2012: p. 323) are likely to occur. Status conflicts may be detrimental to the proper functioning of the group, as status-seeking individuals focus their energy and resources on maintaining or gaining status within the group rather than joining forces to work on a given task (Bendersky and Shah 2012). Bunderson and Reagans (2011) observe that the perceived threat to a team member's status may undermine three processes critical to organizational learning: the anchoring of shared goals, the sharing of knowledge, and risk taking and experimentation. Bothner et al. (2007) find evidence of converse – yet equally detrimental – behavior, showing how NASCAR drivers take excessive risks when challenged in their rank, thereby increasing their probability to be involved in a crash. The disruptions that ensue are likely to be particularly pronounced for conflicts between high-status individuals as opposed to between low-status individuals, given their importance for the group as a whole and the absence of potential facilitators positioned above them in the group's social hierarchy (Groysberg et al. 2011).

2.2.2 Superstar Entry and Status Conflicts

Superstars comprise one subset of such high-status individuals. A phenomenon originally examined in economics, superstars are defined as the "relatively small numbers of people [who] earn enormous amounts of money and dominate the activities in which they engage" (Rosen 1981: p. 845), which they achieve through extraordinary talent (Rosen 1983) or exceptional popularity (Adler 1985).

Whereas the terms ‘high-status individual’ and ‘superstar’ have been used quite interchangeably in previous research (Groysberg et al. 2011, Groysberg and Lee 2008, Malmendier and Tate 2009), I believe that a differentiation is needed. While a significant fraction of individuals in a group command high levels of respect and influence that can be associated with high as opposed to low status (Anderson et al. 2001), only those who “dominate” (Rosen 1981: p. 845) their activities, i.e. those who possess an elevated position that allows them to control the outcome of the group process to some extent, can be considered superstars. Naturally, in competitive situations with multiple teams, the number of superstars must be limited so that not all teams have a superstar in their ranks, allowing the few superstars to use their dominant positions to shape competitive actions and outcomes.

When a superstar joins a new organizational set-up, he⁴ will be expected to bring about significant change for the better in organizational outcomes. Given that this will be associated with perceptions of high value contributions to the team, such a superstar is likely to immediately occupy a high-status position, thereby rendering the existing social hierarchy obsolete with significant implications for how the team works and cooperates, including a high risk of substantial status conflicts.

In the following, I will derive a set of hypotheses as to how individual team members will alter their behavior when a superstar joins the team. I will focus on two team member characteristics: status within the team and complementarity of each individual’s skill-set with that of the superstar. The hypotheses will make predictions about two contextual dimensions of performance, namely cooperation and effort (cf. Koopmans et al. 2011), as well as overall

⁴ For the ease of reading and in line with my all-male sample (cf. chapter 2.4.1), only male pronouns will be used throughout this dissertation. All theoretical considerations are nevertheless meant to apply indifferently from gender.

performance to help develop our understanding of status-induced team dynamics on the individual member level.

2.3 Hypotheses

2.3.1 Cooperation

Cooperation can be defined as “the act of working together to one end” (Mead 1937: p. 8) as opposed to competition, “the act of seeking or endeavoring to gain what another is endeavoring to gain at the same time” (ibid.). Cooperation is particularly important in team situations with high levels of task interdependence. Based on Wageman’s (1995) original construct, Courtright et al. (2015) define task interdependence as “the degree to which taskwork is designed so that members depend upon one another for access to critical resources and create workflows that require coordinated action” (p. 1829). Even in situations of high task interdependence, however, rewards may not be purely collective – i.e., outcome interdependence, defined as “the degree to which the outcomes of taskwork are measured, rewarded, and communicated at the group level so as to emphasize collective outputs rather than individual contributions” (ibid.), may be limited.

Discrepancies between task and outcome interdependence are likely to encourage individuals to compete rather than cooperate with their teammates and they are present in a plethora of collaborative situations, such as: a consulting project, in which complementary roles depend on each other to solve the issue at hand, but promotions and bonuses are allocated individually; a college soccer team that needs extraordinary teamwork to win the championship, but only the members that stand out have a chance to be offered a professional contract; the conservative wing within a political party whose members simultaneously strive for collective success in

decision processes and parliamentary elections, but compete for influence and limited administrative offices amongst themselves.

When a superstar joins a new team, the established social hierarchy is likely to be destabilized and adjusted through a status sorting process. This process may be explicit and transparent: for instance, the superstar may be given a formal role, such as a team captain in sports, that substantiates his claim for leadership. However, it is more likely that status sorting happens implicitly and automatically through intra-group interactions (Overbeck et al. 2005), with formally assigned roles only slowing down or temporarily suppressing the development of a new social hierarchy. In their struggle for high-status positions, team members are likely to adjust their behavior as to enhance others' perceptions of the value they contribute to the team (Anderson and Kilduff 2009a). If the status position a member reaches fails to match his own perception of his relative value contribution, status conflicts may ensue that impede cooperation for extended periods of time (Bendersky and Hays 2012).

Individuals who possessed high-status positions prior to the superstar's joining are likely to display more negative reactions to the newcomer in terms of cooperation compared to lower-status individuals for three reasons. First, given their greater proximity in status to the star, there will be significantly larger potential for their being involved in status conflicts in the first place. For instance, Kilduff et al. (2010) find a strong correlation between status similarity and competitive behavior in their psychological analysis of rivalry in college basketball. For low-status team members, by contrast, nothing much is expected to happen in their immediate vicinity within the social hierarchy, even though they may serve as allies, actively or passively, for their vying high-status peers (Ridgeway and Correll 2006, Podolny and Phillips 1996).

Second, even if status conflicts enflame at different levels of the team's social hierarchy, those individuals at the top are likely to decrease their cooperativeness more significantly and

sustainably, given that there are fewer – if any – team members above them that would be able to help resolve the conflict (Groysberg et al. 2011).

Third, high-status individuals tend to be more concerned with maintaining their positions in a group compared to low-status individuals (Blader and Chen 2011), as they are likely to view their positions in the social hierarchy as a more central and defining part of their selves. As a consequence, they have a harder time continuing to perform at their usual levels when they lose status, which threatens their fundamental self-images (Marr and Thau 2014). Considering the inherently internal process of dealing with such a threat to the self, I argue that it will lead to more inward-oriented behavior and, hence, to reduced cooperation. Taken together, these factors let me expect high-status members to react more negatively to a superstar joining their team in their willingness and ability to cooperate compared to low-status members.

HYPOTHESIS 1 (H1). *The higher an individual's status, the more negatively his cooperation will be affected by a superstar joining the team.*

However, two theoretical arguments contrary to this line of reasoning have been brought forward. First, Anderson et al. (2012) find that individuals differ in their status-seeking behavior and that many of them do not compete for status at all costs. Rather, they tend to accept a position that reflects others' expectations about their value contribution to the group. When a superstar with a proven track record of high performance joins a team, incumbent high-status members may realize that others within and outside the team expect their value contributions to be lower than those of the superstar. Accordingly, they may accept a relatively lower position and, in doing so, pass on decision rights and resources to the superstar to conform to the expectations. This act of cooperation will primarily be observable for high-status individuals, as low-status individuals did not possess significant decision rights and resources to begin with. What is more, once deprived of some of their privileges, these high-status individuals will be

less willing to take the personal risks associated with responsibility and may thus withdraw into a supporting position within the team.

Second, Anderson and Kilduff (2009a) as well as Bendersky and Shah (2012) argue that one way of how individuals pursue status is through excessive displays of generosity and commitment to the team, which can be considered particularly cooperative behavioral patterns. This line of reasoning is diametrically opposed to that of other researchers, who associate more competitive behavior with status conflicts, such as animosity, concealing relevant information, and other counterproductive and even hostile behaviors (Bendersky and Hays 2012, Bunderson and Reagans 2011, Groysberg et al. 2011). If the excessively supportive patterns surpass the competitive patterns in terms of their effect on high-status team members' cooperation, the observed effect will be contrary to H1 as described by H1_{alt}.

HYPOTHESIS 1_{ALT} (H1_{ALT}). *The higher an individual's status, the more positively his cooperation will be affected by a superstar joining the team.*

The impact of a superstar's joining a new team on each team member's cooperation behavior is furthermore likely to vary as a function of the relationship between the superstar's skill-set and that of each other team member. More specifically, I expect team members with skills similar to those of the superstar to react more negatively in terms of their cooperation behavior compared to team members with skills that are complementary to those of the superstar for two reasons. First, one of the primary benefits of social hierarchies has been argued to be the enhancement of group effectiveness through the assignment of roles and responsibilities (Overbeck et al. 2005, Piazza and Castellucci 2014). When there is little or no overlap between the skill-sets of the team members involved, roles can be easily assigned based on task-specific competences. This accelerates the status sorting process, allows for smaller status differentials between team members due to other means of distinguishing oneself, and consequently reduces

the risk of sustained status conflicts. In the case of high or complete skill overlaps, by contrast, status may be the only source of differentiation between team members. When a superstar with a specific skill-set joins a team and makes an incumbent team member with the same skill-set redundant, the latter is likely to doggedly defend his position to avoid slipping into oblivion rather than cooperating in a lower-status role.

Second, similar skill-sets may breed rivalry, i.e. “a subjective competitive relationship [...] that entails increased psychological involvement and perceived stakes of competition for the focal actor, independent of the objective characteristics of the situation” (Kilduff et al. 2010: p. 845), between the superstar and that focal actor. Not only may team members with similar skills focus on each other’s performance as the yardstick for their own behavior, but they may also compete for the same scarce resources – e.g., time in a board meeting to present their ideas – and strive for similar identities – e.g., the company’s number one logistics expert – that only one of them can achieve (Groysberg et al. 2011). As a consequence, team members with skill-sets overlapping with that of the superstar are expected to focus a larger fraction of their energy on internal competition rather than collective task attainment and, hence, display lower levels of cooperation.

HYPOTHESIS 2 (H2). *The more complementary an individual’s skill-set is to that of the superstar, the more positively his cooperation will be affected by a superstar joining the team.*

2.3.2 Effort

I have argued that a superstar joining a team will trigger competition for status among its members and potentially result in status conflicts. With respect to the effects of intra-team competition on individual team members’ effort and motivation, the literature has provided

ambiguous results so far (Kilduff et al. 2010, Scheepers et al. 2009): Both positive (Tauer and Harackiewicz 2004) and negative (Stanne et al. 1999, Deutsch 1949) relationships between competition and effort have been found. Differences in personal dispositions, such as in the level of achievement orientation (Tauer and Harackiewicz 1999), provide the most convincing explanation for these mixed findings (Kilduff et al. 2010). I argue that relative status and skill complementarity as relational aspects, too, moderate this relationship in the case of internal competition for status triggered by a star newcomer. More specifically, I expect high-status individuals to display higher levels of effort as a short-term response, i.e. in the weeks immediately after the change in team composition, but lower levels of effort in the long-term vis-à-vis low-status individuals.

In the short term, high-status individuals' higher relative effort level can be explained by two factors. First, high-status team members are likely to be most concerned with defending their status positions (Blader and Chen 2011) and to be most significantly exposed to the threat of status loss through the incoming superstar (Marr and Thau 2014). They will consequently compete for status, amongst others by displaying extraordinary commitment to the team (Anderson and Kilduff 2009a, Bendersky and Shah 2012), which is likely to precipitate higher levels of effort. Second, high status has been associated with complacency and distraction (Bothner et al. 2012). Being not only a means to accessing critical resources, but also an end in itself, achieving high status “subtly ushers its possessor into nonproductive states and activities” (p. 418) and thus results in lower levels of effort. When this high-status position is challenged through the arrival of a superstar, however, I expect high-status individuals to be ‘shocked into action’ and to make significant efforts to defend their positions.

In the longer term, however, high-status individuals' effort is likely to wane. In light of the superstar's exalted position, other high-status individuals will have less than a fair chance of

winning the intra-team status contest, which is likely to reduce intrinsic motivation to compete (Tauer and Harackiewicz 2004) and, thus, the effort they invest. Even in the rare cases in which an incumbent high-status individual manages to successfully defend his leading position against the incoming superstar, he is likely to sustain higher levels of effort for only limited periods of time, while his victory will reinforce the tendency to become complacent. Low-status individuals, by contrast, are less affected by the ongoing competition for status. However, research on company alliances has shown that high-status partners are able to extract higher levels of effort from their low-status counterparts (Castellucci and Ertug 2010). This may also hold true for individuals in a team: in an attempt to show their being ‘worthy’ of collaborating with the superstar, low-status members will make an additional effort. Yet given that this additional effort is not triggered by perceptions of rivalry or threat, I expect it to be less pronounced, but more sustainable than the effort displayed by high-status individuals, which leads to the following hypotheses.

HYPOTHESIS 3 (H3). *The higher an individual’s status, the more positively his effort will be affected by a superstar joining the team in the short term.*

HYPOTHESIS 4 (H4). *The higher an individual’s status, the more negatively his effort will be affected by a superstar joining the team in the long term.*

I furthermore expect team members whose skill-sets overlap with that of the superstar to display higher levels of effort compared to team members with complementary skill-sets for two reasons. First, similar to the line of reasoning for high-status individuals, a member with overlapping skills will feel more challenged in his status position due to mere proximity and, thus, make a greater effort to defend it. Second, incoming superstars may serve as positive role models that “boost motivation by providing a guide to success; they personify plausible desired selves that people can realistically aspire to become and illustrate the means for achieving these

desired selves” (Lockwood et al. 2002: p. 855). Such role models will be particularly relevant to those individuals who pursue career paths similar to that of the superstar, which will be most attainable for those who possess comparable skill-sets. As a consequence, overlapping skill-sets between the superstar and other team members are likely to result in enhanced effort.

HYPOTHESIS 5 (H5). *The more complementary an individual’s skill-set is to that of the superstar, the more negatively his effort will be affected by a superstar joining the team.*

2.3.3 Performance

Using my lines of reasoning on cooperation and effort as a starting point, I predict high-status individuals to be more negatively affected in their performance by an incoming superstar compared to low-status individuals for three reasons. First, I argued that a superstar’s joining the team will affect high-status individuals’ cooperation more negatively than low-status individuals’ cooperation (H1). A positive relationship has been shown to exist between cooperation and performance on a team level (Lee et al. 2015), which I expect to also be present on the level of the individual team member. Thus, high-status individuals who restrict their cooperation with the newcomer will suffer from deteriorating performance. Even if H1 is rejected and the opposite prediction of H1_{alt} simultaneously finds empirical support – i.e. even if high-status individuals respond to the new set-up by taking a more supportive role in compliance with others’ expectations (Anderson et al. 2012) – the positive effect on team performance is likely to be ascribed to the superstar’s individual performance rather than the now less salient incumbent high-status member. What is more, their eagerness to display commitment to and support for the team may go beyond what is expedient and may actually be detrimental to team performance (Anderson and Kilduff 2009a). As a result, high-status team

members are expected to experience a more negative effect on their individual performance than low-status team members.

Second, I expect high-status individuals to reduce their effort in the long term compared to low-status individuals (H4), which will have a concurrent harmful effect on performance. Even if they increase their relative effort in the short term (H3), they are likely to “overinvest [...] beyond the point where these activities are detrimental to their performance” (Bendersky and Shah 2012: p. 309), resulting in a more negative performance effect in the short and long terms.

Third, compared to their low-status counterparts, who are already acquainted with less privileged positions, high-status individuals will be more affected by factors that immediately reduce their ability to perform a given task: They will be restricted in their access to critical resources and information (Bendersky and Hays 2012, Bothner et al. 2012); they will experience less freedom of action and, thus, will be less inclined to take risks (Bunderson and Reagans 2011); they will lose confidence (Bothner et al. 2012), which may turn the virtuous “efficacy-performance spiral” (Shea and Howell 2000: p. 793) into a vicious circle of damaged self-belief, underperformance, and emotional withdrawal; likewise, the so-called “Pygmalion Effect” (Bendersky and Shah 2012: p. 308), through which high status leads to high performance expectations and, eventually, to the confirmation of these expectations, will wear off and make success more difficult to achieve; and they will benefit less from learning from and sharing knowledge with their superstar colleague than their low-status peers (Groysberg and Lee 2008).

Taking these aspects together, I expect low-status individuals’ performance to suffer less from a superstar joining the team than that of high-status individuals.

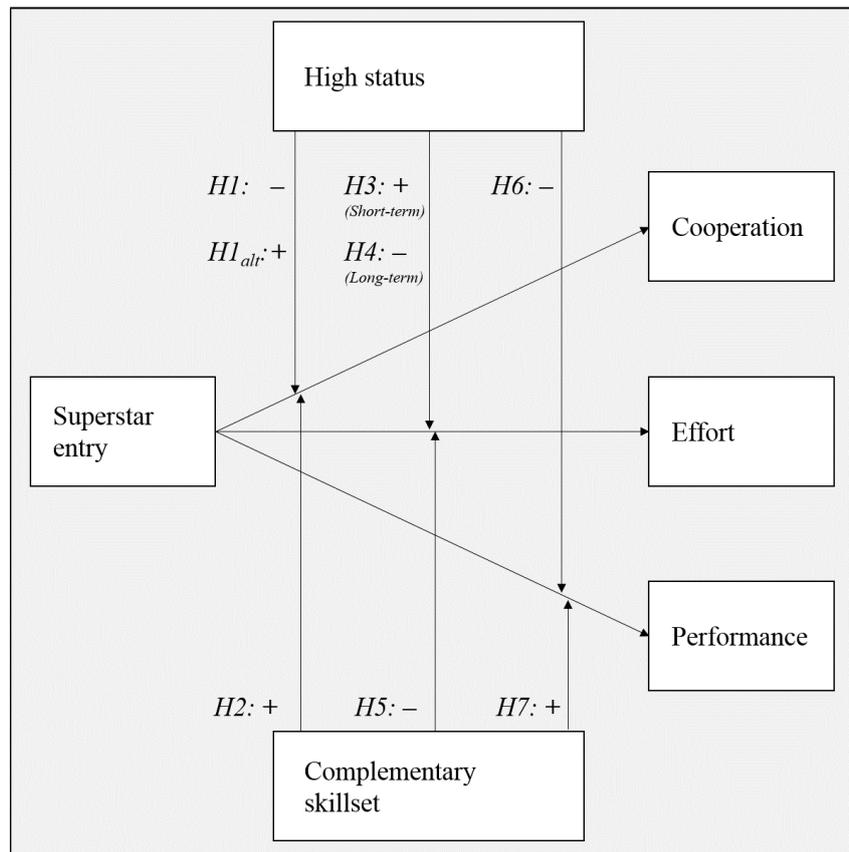
HYPOTHESIS 6 (H6). *The higher an individual's status, the more negatively his performance will be affected by a superstar joining the team.*

Furthermore, I expect team members with skill-sets that are complementary to that of the superstar to display higher levels of cooperation (H2), but lower levels of effort (H5) compared to those with overlapping skill-sets. While these two interpersonal effects will to some degree cancel each other out with respect to individual performance, I hypothesize that team members with skills complementary to the superstar's skills will perform better due to superior access to other team members' knowledge and capacities. Perretti and Negro (2006) argue that, given that teams are more than the sum of their members, the focus of team composition shifts "from choosing from a given set of members to choosing from a set of interdependent combinations" (p. 761). Accordingly, the value that a team can possibly create is defined by "the nature of entire portfolios of skills rather than any single skill in isolation" (Campbell et al. 2012: p. 379), particularly for high levels of task interdependence. Team members with skills complementary to those of the superstar will consequently profit most from the star's high-quality contributions in his area of expertise that promote the entire team's performance, while those with overlapping skills run into danger of becoming obsolete. The findings of Thomas-Hunt et al. (2003) support this perspective: they show how team members who gain expert status through unique knowledge benefit from extensive knowledge sharing, while their peers lacking exclusive expertise do not. In sum, I expect the performance of team members with skills complementary to those of the incoming superstar to be more positively affected by the new team set-up than that of team members whose skills overlap with those of the superstar.

HYPOTHESIS 7 (H7). *The more complementary an individual's skill-set is to that of the superstar, the more positively his performance will be affected by a superstar joining the team.*

Figure 2 summarizes the hypotheses on how a superstar’s joining a new team will affect individual team-member level cooperation, effort, and performance as a function of individual status and skill complementarity.

Figure 2: Overview of Hypotheses



2.4 Methods

2.4.1 Research Setting

To test my hypotheses, I analyze superstar transfers in the NBA over a thirty-year time period. Team sports, and basketball in particular, have a long tradition as the setting for organizational research (Day et al. 2012, Berman et al. 2002). In his landmark paper, Deutsch (1949) already used sport as an intuitive application of his conceptualizations of cooperation and competition, explaining how “the members of a basketball team may be co-operatively interrelated with

respect to winning the game, but competitively interrelated with respect to being the ‘star’ of the team” (p. 132). Basketball games as ‘natural laboratories’ for organization and management research have gained relevance over the last decades (e.g., Pfeffer and Davis-Blake 1986, Staw and Hoang 1995) and have become ever more prevalent in recent years (e.g., Ertug and Castellucci 2013, Halevy et al. 2012, Kilduff et al. 2010).

Three primary advantages of professional basketball as a research setting explain this phenomenon. To begin with, the NBA offers comprehensive and objective performance data (Berman et al. 2002, Ertug and Castellucci 2013) both on the individual and team levels as well as enormous transparency concerning aspects such as inter-team mobility and remuneration. Given the limited roster and team sizes and the fact that every player on the field is permanently involved in both offensive and defensive play as opposed to the norms in other team sports, such as soccer or baseball, the NBA as a research setting is likely to be unmatched in terms of data density and intelligibility.

Second, basketball provides a ‘laboratory-like’ controlled setting, in which all players are required to comply with the same set of clearly defined rules and pursue the same collective objectives (Frey et al. 2013). As a consequence, there are agreed-upon criteria that distinguish good performances on the field from disappointing ones, legitimizing the performance metrics described above as meaningful for individual performance appraisals.

Finally, findings from basketball can be expected to be applicable to multiple other organizational contexts, including business organizations (Kilduff et al. 2010). Sports teams share important characteristics with companies, such as “their mutual concern for competing externally, cooperating internally, managing human resources strategically, and developing appropriate systems and structures” (Berman et al. 2002: p. 17) as well as hierarchies (Kilduff et al. 2010). While task interdependence is high in basketball – arguably the highest among all

globally relevant team sports (Berman et al. 2002) – outcome interdependence is limited in that player salaries vary widely and individual performance is rewarded separately from team performance “through awards (e.g., the Most Valuable Player award) or selection for special teams (e.g., for the NBA All-Star Game or All-NBA Teams), whose composition is voted on by coaches, sportswriters, broadcasters, and fans” (Ertug and Castellucci 2013: p. 413). Furthermore, there is no doubt about the NBA being the predominant basketball league in the world, attracting the most talented and renowned players of the planet, which is likely to result in a high density of ambitious, high-performing individuals. These factors are likely to result in players both cooperating and competing with each other simultaneously and to provide fertile soil for interpersonal conflicts (Courtright et al. 2015, Deutsch 1949).

2.4.2 Sample

My sample consists of player-game combinations in the National Basketball Association from the 1985/86 to the 2014/15 season, data on which have been collected from <http://www.basketball-reference.com/> between July and November 2015 using Stata 13. I restrict my analysis to these thirty seasons to account for the fact that many per-game data items are only available from 1985 on, as are salary information due to the salary cap regulation that has come into effect at the beginning of that season. Incomplete data points and the superstars migrating from one team to another excluded, a total of 2,137 players were active in the league during this period, participating in an average of 322 games – ranging from Kalin Lucas’s single appearance to Karl Malone’s 1,476 games⁵ on the pitch – which results in a total of 688,680 unique player-game combinations.

⁵ The all-time NBA record for games played is currently held by Robert Parish with 1,611 appearances between 1976 and 1997 – however, he had already played nine seasons in the NBA prior to the beginning of our observation period, which are thus not included in the sample. Mr. Parish is one of only three players to have

2.4.3 Dependent Variables

Cooperation. Assists have been used as the primary measure of cooperation in basketball research settings (Berman et al. 2002, Halevy et al. 2012). The NBA (2002) defines an assist as “a pass that directly leads to a basket”, whereby it is at the statistician’s discretion to evaluate whether the last pass contributed immediately to the basket scored or not. An assist describes a player’s tendency to cooperate as it represents his decision to pass the ball to a teammate in a good position to score rather than taking the shot himself. As such, he forgoes the personal benefit associated with scoring for the good of the whole team’s higher probability to score.

However, assists are an incomplete measure of cooperation, as they only cover positive cooperation decisions with positive outcomes, i.e. passes followed by scored baskets. I therefore subtract negative cooperation decisions with negative outcomes, i.e. missed field goal attempts, from assists to create a more comprehensive cooperation measure that I will call *cooperativeness*. In so doing, I build on the line of reasoning of Swaab et al. (2014), who use field goal percentage, the ratio of the number of field goals scored divided by the number of field goals attempted, as a measure of team-level collaboration, arguing that a well-coordinated squad will create better scoring chances and, thus, achieve a higher field goal percentage. Reversely, missed field goals can serve as a measure of the absence of cooperative behavior. Even though the other two possible cases – positive cooperation decisions with negative outcomes, i.e. well-intended passes followed by missed throw attempts, and negative cooperation decisions with positive outcomes, i.e. scored baskets despite availability of a better positioned teammate – cannot be included for lack of corresponding data, I believe

appeared in more than 1,500 games during their NBA careers. The other two are Kareem Abdul-Jabbar (1969-1989) and John Stockton (1984-2003), the latter of whom spent his entire NBA career with the Utah Jazz and thus holds the record for the number of games played for a single club.

cooperativeness to accurately represent the ‘heat-of-the-moment’ choice between cooperative and egoistic action. Another advantage of this variable is that it does not measure cooperation for its own sake, but takes the eventual purpose of collaborating – in this case: scoring – into account by omitting cooperative behavior that is unrelated to scoring outcomes. Finally, the numbers of assists and missed field goal attempts tend to cancel each other out on average in the course of a game, making *cooperativeness* largely independent from minutes played per game.

Effort. An aggregate comprising the number of three actions performed on the pitch will be used to describe individual effort: offensive rebounds, i.e. retrieving the ball after a missed scoring attempt by the own team, thereby thwarting the opponent’s counter-attack; shot blocks, i.e. preventing an opponent’s shot from reaching the basket; and steals, i.e. intercepting passes or otherwise taking possession of the ball from the opponent team.

In doing so, I follow the proposition of Kilduff et al. (2010) that defensive actions⁶ are primarily associated with effort, while fluctuations in the success of offensive actions, above all scoring, depend more strongly on a variety of factors, including cooperation, form on the match day, and luck. I restrict myself to these three actions for two reasons. One is data availability: unlike other studies, in which individual games were observed and actions like sprints down the field to restore the defensive formation could be coded (Emich 2014), my sample does not include as many measures for the sake of covering a 30-year timespan instead. The other is delimitating effort from cooperation: I consider offensive rebounds, blocks, and steals to be actions that

⁶ As the name implies, offensive rebounds are broadly considered an offensive action. I argue, however, that any form of regaining possession of the ball for one’s own team, including steals, blocks, and rebounds, is primarily a defensive action as opposed to offensive actions that exploit such a possession, including passes, dribbling, and throws.

Methods

players can largely execute at their discretion and that do not require coordination with teammates to lead to the desired outcome. Other defensive actions, by contrast, such as defensive rebounds, more strongly depend on the players' coordinating their movements within the defensive formation (Swaab et al. 2014) and may thus be affected by changes in cooperation behavior due to a change in team composition. To account for fluctuations in playing time caused by team composition changes, the total amount of these three actions will be divided by the number of minutes played in each game to calculate the *effort* measure. On average, one such action is performed once every nine and a half minutes (cf. Table 1).

Table 1: Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|-----|-------------|---------------------------------|---------|--------|--------|-------|--------|
| 1 | Dependent | <i>Cooperativeness</i> | 688,680 | -2.200 | 3.323 | -26 | 24 |
| 2 | Dependent | <i>Effort</i> | 688,680 | 0.106 | 0.113 | 0 | 20 |
| 3 | Dependent | <i>Efficiency</i> | 688,680 | 0.417 | 0.410 | -60 | 120 |
| 4 | Control | <i>Position: center</i> | 688,680 | 0.330 | 0.470 | 0 | 1 |
| 5 | Control | <i>Position: power forward</i> | 688,680 | 0.353 | 0.478 | 0 | 1 |
| 6 | Control | <i>Position: small forward</i> | 688,680 | 0.336 | 0.472 | 0 | 1 |
| 7 | Control | <i>Position: shooting guard</i> | 688,680 | 0.339 | 0.473 | 0 | 1 |
| 8 | Control | <i>Position: point guard</i> | 688,680 | 0.259 | 0.438 | 0 | 1 |
| 9 | Control | <i>Team tenure</i> | 688,680 | 114 | 166 | 1 | 1,489 |
| 10 | Control | <i>Age (days)</i> | 688,680 | 9,966 | 1,467 | 6,581 | 15,769 |
| 11 | Independent | <i>Days</i> | 688,680 | 82.912 | 54.386 | 1 | 234 |
| 12 | Independent | <i>Superstar entry</i> | 688,680 | 0.028 | 0.166 | 0 | 1 |
| 13 | Independent | <i>Relative pay</i> | 688,680 | 1.112 | 1.004 | 0.002 | 10.927 |
| 14 | Independent | <i>All-NBA team</i> | 688,680 | 0.067 | 0.250 | 0 | 1 |
| 15 | Independent | <i>Position overlap</i> | 55,217 | 1.858 | 1.045 | 1 | 4 |
| 16 | Independent | <i>Height differential</i> | 55,217 | 0.018 | 0.026 | 0 | 0.285 |

Note: Superstars transferred (8,435 observations) excluded from sample.

Performance. I use *efficiency*, a commonly used statistic to summarize players' accomplishments on the field, divided by minutes played to measure each player's game performance. Simply described, *efficiency* is the sum of the number of actions that contribute to a positive team outcome – points, rebounds, assists, steals, and blocks – from which the number of actions that undermine a positive team outcome – missed field goals, missed free-throws, and turnovers – is subtracted. As a result, *efficiency* provides an accurate description of

each player’s contribution to the team’s winning or losing a game. I apply *efficiency* on a per-minute basis to avoid distortions caused by the fact that positive actions typically outweigh negative ones substantially and changes in team composition may have an impact on playing times. Table 2 summarizes how the three dependent variables are calculated.

Table 2: Dependent Variables in Detail

| Variable | Formula |
|-----------------|---|
| Cooperativeness | $Assists - Field\ goals\ missed$ |
| Effort | $(Offensive\ rebounds + Blocks + Steals) / Minutes\ played$ |
| Efficiency | $((Points + Rebounds + Assists + Steals + Blocks) - (Field\ goals\ missed + Free\ throws\ missed + Turnovers)) / Minutes\ played$ |

2.4.4 Independent Variables

Time. The data panel is structured along the time variable *days*, which represents the calendar days since the first game in a given season for each player-game combination, including both regular season and playoffs.

Superstar entry. The binary variable *superstar entry* indicates whether or not a superstar has joined a team at the beginning of a given season. I consider those players superstars that have been awarded the NBA Most Valuable Player (MVP) award or the Bill Russell NBA Finals Most Valuable Player (Finals MVP) award at the end of any previous season. Both titles are awarded by panels of media representatives to the players that are considered to have contributed the most to their team’s success during the regular season or the NBA Finals championship series, respectively. Out of more than a dozen individual-player awards in the NBA, I believe that these two are most suitable to identifying superstars that “dominate the activities in which they engage” (Rosen 1981: p. 845). Being either proclaimed the best player over the 82-game regular season – usually by unanimous vote – or the player that contributed the most to winning the championship for his team are signals of outstanding performance and

can be expected to grant these players special status far beyond the subsequent seasons. In the time period examined, a total of 35 MVP transfers within the NBA have occurred.

Status. Two alternative variables will be used to measure status: *relative pay* as a discrete variable and *All-NBA alumnus* as a binary variable.

I define *relative pay* as each player's annual salary compared to all NBA players' salaries in the same season. To increase the robustness of my analysis, I will also employ each player's annual salary compared to all his teammates as well as compared to all players occupying the same position(s) on the field in the same season.

I am convinced that salaries accurately reflect players' status positions within the team for the following reasons. To begin with, status and performance re-inforce each other (Magee and Galinsky 2008): past performance serves as a powerful signal of expectable future value contribution to the team (Kilduff and Galinsky 2013), resulting in high status. High status, in turn, drives performance enhancements through a number of mechanisms described above, including access to valuable resources and freedom of action (Bendersky and Hays 2012, Bendersky and Shah 2012, Bunderson and Reagans 2011). Given that increased performance improves a player's relevance to and, hence, negotiation power vis-à-vis his employer, I conclude that it will ultimately lead to higher income. What is more, other players on the team will use the publicly available income information as indication of what their employer believes the players' relative contributions to the team's success to be (Brown et al. 2003) and align their own assessments of perceived value contributions and, eventually, status accordingly. Even if income information were not publicly available, team members would use other indicators, such as private cars, housing, and vacation destinations, to get a basic understanding of their relative income positions. Finally, income naturally incorporates the time lag that is likely to exist in the performance-status relationship: While a single demonstration of extraordinary

talent at an early career stage is unlikely to significantly enhance either status or income, sustained outstanding performance will. Likewise, if a star's performance begins to deteriorate toward the end of his career, both income and status can be expected to remain 'sticky' at high levels for extended periods of time (Magee and Galinsky 2008).

In addition, *All-NBA team alumnus* is included as a binary variable to measure status. At the end of each season since 1946, media representatives have elected two line-ups of five players each to represent the best players of that season. A third line-up, which I exclude from my analysis to ensure longitudinal consistency, has been added from 1988 on. Being considered among the top ten players of any season represents a strong status signal to teammates, even though it does not necessarily entail being a superstar, given that there are nine other players that equally stand out. A total of 99 players that had been elected as members of the All-NBA teams in the first or second line-up at least once have been active in the time period from the 1985/86 to 2014/15 seasons.

Skill complementarity. I include two variables to measure the degree to which a player's skills are complementary or redundant with those of the superstar joining the team. These are: *position overlap* and *height differential*.

Traditionally, there have been five positions a player can take on the field: point guard (PG), shooting guard (SG), small forward (SF), power forward (PF), and center (C). Although modern basketball has seen players become more and more flexible in the positions they take over the course of any given game, players will nevertheless be limited in the number of roles they are able to occupy on the field, which are still associated with one or several of these positions. Each of these roles requires a specific skill-set. For example, center and power forward players need to possess sufficient physical presence and robustness in direct proximity to the basket, while the guards primarily need excellent acceleration and shooting precision from the three-

point line. Given the extreme talent density in the NBA as the unquestionably world's best basketball league on the one hand and the partially conflicting skill requirements of the different roles on the other hand – for instance, a big body will help with controlling the ball close to the opponent's basket, but will take its toll on speed and sprint ability – the majority of players will only perform one or two roles in any given game. In fact, my data do not identify a single player who consistently occupied more than 3 roles in any given season. The set of roles a player can take on the field is therefore an accurate reflection of the breadth of that player's skill-set.

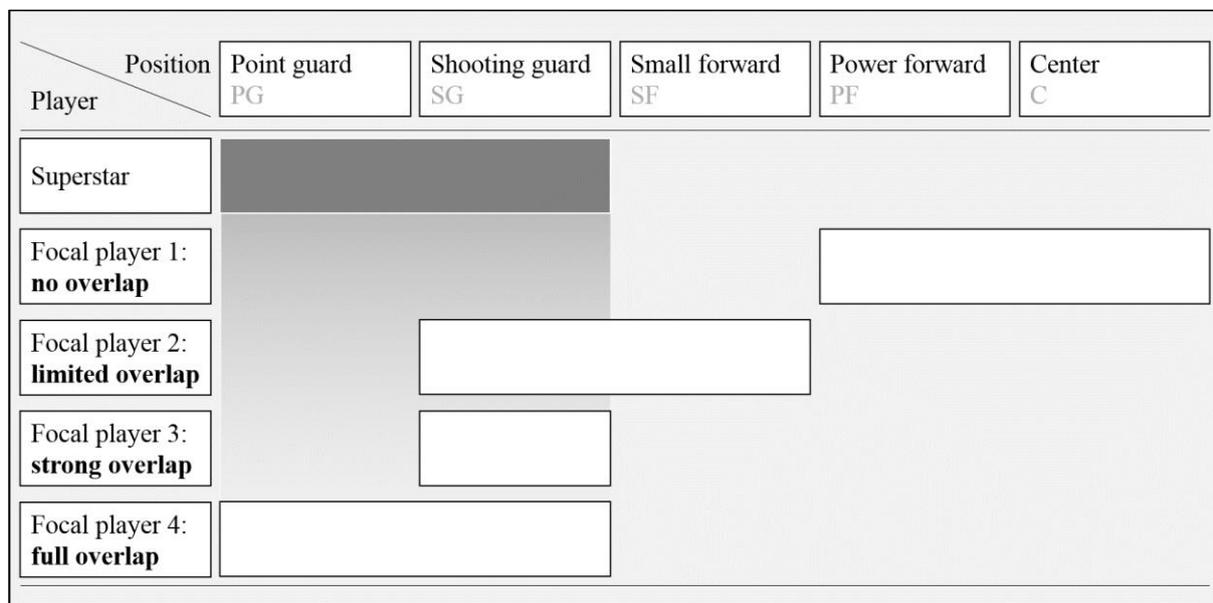
Based on those roles, I developed the variable *position overlap* as an ordinal measure that can take on 4 different states: first, 'no overlap' describes a situation in which the observed player and the incoming superstar do not occupy the same positions on the field at all and thus possess fully complementary skills; second, 'limited overlap' describes a situation in which both players can occupy at least one position each that the respective other cannot or in which one of the two has multiple alternative positions; third, 'strong overlap' implies that one player can take only one alternative position while the other cannot take any alternative position; finally, 'full overlap' corresponds to a situation in which both the focal player and the superstar joining the team can only occupy the exact same position(s), which represents skill-sets that are mostly redundant. Figure 3 provides a fictitious example of a superstar guard joining a team and of how his skill-set overlaps with those of four teammates⁷. This ordinal measurement of skill

⁷ Note that player 4 is considered to have a stronger skill overlap with the superstar than player 3 in this example, even though the former has an additional alternative position compared to the latter: if the superstar takes the SG position, player 4 can take the PG position and vice versa. By contrast, player 3 does not have the opportunity to get out of the way, if the superstar takes the SG position. Even if not entirely intuitive, this is intended: my main interest is the complementarity of *skill-sets*, not that of positions, within the team. Even though player 4 may have an additional alternative compared to player 3, the latter has a higher likelihood of being perceived as different from the superstar due to an even more specialized skill-set. He may, thus, find his new role within the team's hierarchy more easily than player 4, who may be considered a 'not quite as good' version of the superstar.

Methods

complementarity will facilitate a differentiated analysis that also accounts for potential non-linear effects.

Figure 3: Exemplary Position Overlap Constellations



I define *height differential* as the squared difference between the superstar’s body height and the focal player’s body height in centimeters as a continuous measure of skill complementarity. Like above, the reasoning is that the unmatched talent density in the NBA entails that only those with the most valuable skills specific to each position on the field will be able to secure a spot in a team. Body height is among the factors that most significantly determine the partially conflicting skills a player possesses, such as agility and acceleration for short players as opposed to robustness and reach for tall players. As a result, a short player is highly likely to possess particular strengths in the realms of agility and acceleration given his individual physique – if he did not, he would not have been drafted into the world’s most prestigious basketball league – while lacking the robustness and reach of taller players, who in turn would not have been selected to play in the NBA without excelling at those skills that their physical build predefines. In sum, body height predetermines at what skills any given player can

distinguish himself enough to make it to the NBA. As a result, the difference in body height between two players serves as a feasible approximation of how complementary they are in terms of their skill-sets.

2.4.5 Control Variables

Multiple individual- and team-level control variables have been considered for incorporation into the analysis. The following three individual-level controls are included due to their expected significance for the results of the analysis.

Player position. First, one binary control variable is included for each of the five positions on the field. Given that players' different roles are likely to have an effect on how they collaborate, they may also influence a player's response to a change in the social hierarchy caused by a superstar joining the team.

Age. Second, I include each player's age in days at the beginning of each season. This is to account for the fact that basketball players, like any other high-performance athletes, go through a professional life-cycle, in which they first improve their performance as they gather experience until the ageing process incrementally limits their potential. Their likely capacity to improve as determined by their age may have a strong influence on players' responses to a newcomer superstar claiming the top spot in the team's social hierarchy and is thus included as a control variable.

Team tenure. Finally, I include the number of matches that a player has played for a specific club without playing for another club in between at the beginning of each season. The reasoning is that, given the dynamic nature of the status sorting process (Bendersky and Hays 2012), the higher the tenure with one specific team, the more stable that individual's position within the team is likely to be. As a consequence, I expect stronger defensive responses from those players

that have established a certain position in the team's social hierarchy over time compared to players who are relatively new to the team and yet have to find their rank.

A number of additional control variables both on the individual and team levels were taken into consideration, but were excluded in the actual data analysis, as they were consistently insignificant. On the individual level, these comprise: each player's previous experience with superstar transfers; the number of years since the superstar received the MVP award that made me consider him a superstar⁸; and each player's position in the NBA entry draft that served as an indication of a player's inherent quality in previous studies (Berman et al. 2002). On the team level, the following variables were suggested by the literature (Halevy et al. 2012, Ertug and Castellucci 2013), but were not included for lack of significance: winning and losing streaks as indicated by game results over multiple games; team positions and championships in previous years; average team salary; and pay dispersion in the team.

2.4.6 Model Specification

Base function. I employ FGLS regression to test the hypotheses using the unbalanced panel dataset described above. I use the random-effects specification to account for the fact that both time-variant and time-invariant variables are employed in the model, and my approach is supported by the lack of a significant result that a Hausman test provides⁹. Each of the time periods that define the panel represents one full season, which includes both the regular season

⁸ In their analysis of the impact of status on hiring and team performance in the NBA, Ertug and Castellucci (2013) limit the player's assumed status enhancement of an award to three seasons after winning it. However, they find significant effects over and beyond a 7-year time period. My observation that the years since the award do not seem to have an effect on the findings and the decision to therefore exclude the control variable is hence in line with their findings.

⁹ Even though not all individual analyses exploit time-variant variables – i.e., some analyses zero in on specific time intervals without examining changes over time within or between time intervals, which would allow for simpler OLS regression models – I apply random-effects time series models throughout, which are structurally different but lead to equivalent results, in order to ensure methodical consistency.

and the playoffs and spans up to 234 days or roughly eight months. For that approach, eight superstar transfers were excluded from the dataset, since they occurred in the course of a season as opposed to between seasons. I use a difference-in-differences (DID) approach to compare players whose teams were complemented by a superstar at the beginning of a given season with those whose teams did not based on the dummy variable *superstar entry*. I apply this to the independent variables related to status, namely *relative pay* and *All-NBA alumnus*. Since the independent variables related to skill complementarity, i.e. *position overlap* and *height differential*, can by definition only be measured in cases in which a superstar joins the team, I restrict my analysis to within-team comparisons for the corresponding hypotheses.

Short vs long term. Compared to other research in organizational behavior, I zero in on relatively short time intervals. My understanding of the *short term* is each player's immediate reaction within the first 30 days – or even shorter periods within the first month – after the superstar's first appearance with the new team. By contrast, I define what I consider a sustainable behavioral adaptation over the course of one full season of up to eight months as the *long term*.

2.5 Results

Table 3 summarizes the correlations between the dependent, independent, and control variables. While the large sample size contributes to high significance levels, correlations are consistently below 0.5 for all measures meant to represent different constructs and below 0.25 for all combinations including dependent variables.

Table 3: Variable Correlations

| No. | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|-----|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|
| 1 | <i>Cooperativen.</i> | 1.000 | | | | | | | | | | | | | | | |
| 2 | <i>Effort</i> | -0.064 | 1.000 | | | | | | | | | | | | | | |
| 3 | <i>Efficiency</i> | 0.078 | 0.211 | 1.000 | | | | | | | | | | | | | |
| 4 | <i>Pos.: C</i> | -0.030 | 0.244 | 0.051 | 1.000 | | | | | | | | | | | | |
| 5 | <i>Pos.: PF</i> | -0.077 | 0.182 | 0.052 | 0.433 | 1.000 | | | | | | | | | | | |
| 6 | <i>Pos.: SF</i> | -0.151 | -0.059 | -0.019 | -0.280 | 0.002 | 1.000 | | | | | | | | | | |
| 7 | <i>Pos.: SG</i> | -0.065 | -0.202 | -0.046 | -0.486 | -0.505 | 0.094 | 1.000 | | | | | | | | | |
| 8 | <i>Pos.: PG</i> | 0.239 | -0.183 | -0.027 | -0.417 | -0.468 | -0.370 | 0.255 | 1.000 | | | | | | | | |
| 9 | <i>Team tenure</i> | -0.087 | 0.016 | 0.066 | -0.013 | -0.064 | -0.042 | -0.002 | 0.002 | 1.000 | | | | | | | |
| 10 | <i>Age (days)</i> | 0.019 | -0.044 | 0.000 | 0.043 | 0.017 | 0.079 | 0.059 | -0.072 | 0.151 | 1.000 | | | | | | |
| 11 | <i>Days</i> | -0.017 | -0.016 | 0.006 | -0.004 | 0.001 | -0.009 | 0.003 | 0.005 | 0.066 | 0.005 | 1.000 | | | | | |
| 12 | <i>Superstar entry</i> | 0.001 | -0.005 | -0.004 | 0.005 | -0.015 | -0.015 | 0.037 | 0.002 | -0.064 | -0.011 | 0.031 | 1.000 | | | | |
| 13 | <i>Relative pay</i> | -0.185 | 0.032 | 0.099 | 0.058 | 0.056 | 0.031 | -0.006 | -0.092 | 0.388 | 0.301 | 0.039 | 0.005 | 1.000 | | | |
| 14 | <i>All-NBA alumnus</i> | -0.153 | 0.030 | 0.077 | -0.030 | -0.056 | -0.012 | 0.068 | -0.035 | 0.253 | 0.274 | 0.037 | -0.016 | 0.557 | 1.000 | | |
| 15 | <i>Pos. overlap</i> | -0.034 | 0.078 | 0.006 | 0.323 | 0.242 | 0.033 | -0.124 | -0.214 | -0.002 | 0.051 | 0.006 | -0.019 | -0.035 | -0.049 | 1.000 | |
| 16 | <i>Height diff.</i> | 0.154 | -0.074 | -0.005 | -0.167 | -0.253 | -0.233 | 0.039 | 0.419 | -0.018 | -0.123 | 0.003 | 0.042 | -0.064 | -0.038 | -0.440 | 1.000 |

Notes: Correlations in bold are significant at $p < 0.05$. Superstars transferred (8,435 observations) excluded from sample.

2.5.1 Cooperation

Table 4 provides an overview of the regression models testing the effects of status on *cooperativeness*. The base model including only control variables and the binary *superstar entry* variable provides weak evidence ($p < 0.10$) for an improvement in *cooperativeness* when a superstar joins the team and for significant ($p < 0.01$) differences among positions on the pitch, the point guard being the most cooperative in his playmaker role.

Model 1 examines the effect of *relative pay* as an indicator of status on individual player *cooperativeness* in the superstar entry scenario. While *relative pay* is revealed to be significantly ($p < 0.01$) and negatively related to *cooperativeness* in general, a significant ($p < 0.01$) positive effect of *relative pay* is found when a superstar joins the team. The effect persists

Results

when income is compared to players of the same position or team instead of all players in the league (cf. Appendix A, Tables A-1 and A-2). This observation – the negative link between *relative pay* and *cooperativeness* in the absence of a new superstar being mitigated by a superstar’s joining – offers strong support for H1_{alt}, but not for H1. A break-down of *cooperativeness* furthermore shows that this effect is driven by a simultaneous increase in assists ($p < 0.01$; cf. Appendix A, Table A-3) and a decrease in missed field goals ($p < 0.05$; cf. Appendix A, Table A-4) due to fewer throw attempts ($p < 0.10$, cf. Appendix A, Table A-5). Likewise, Model 2 shows a significant negative ($p < 0.01$) effect of *All-NBA alumnus* on *cooperativeness*, which is, albeit not significantly, mitigated in the case of superstar entry.

Table 4: Results of Regression Analyses Testing Effects of Status on *Cooperativeness*

| Variable | Base model | Model 1: <i>Relative pay</i> | Model 2: <i>All-NBA alumnus</i> |
|--|-------------|---------------------------------|------------------------------------|
| <i>Superstar entry</i> | 0.146 * | - 0.129 | 0.125 |
| <i>Relative pay</i> | | - 0.757 *** | |
| <i>Superstar entry x relative pay</i> | | 0.249 *** | |
| <i>All-NBA alumnus</i> | | | - 1.062 *** |
| <i>Superstar entry x All-NBA alumnus</i> | | | 0.394 |
| <i>Pos.: C</i> | - 0.226 *** | 0.001 | - 0.232 *** |
| <i>Pos.: PF</i> | - 0.371 *** | - 0.264 *** | - 0.369 *** |
| <i>Pos.: SF</i> | - 0.650 *** | - 0.492 *** | - 0.656 *** |
| <i>Pos.: SG</i> | - 0.698 *** | - 0.656 *** | - 0.697 *** |
| <i>Pos.: PG</i> | 1.353 *** | 1.439 *** | 1.351 *** |
| <i>Team tenure</i> | - 0.003 *** | - 0.001 *** | - 0.002 *** |
| <i>Age (days)</i> | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Constant</i> | - 2.848 *** | - 3.453 *** | - 3.075 *** |
| <i>No. of observations</i> | 688,680 | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 3,679.14 | 5,210.15 | 3,963.82 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.225 | 0.328 | 0.237 |
| <i>R² (overall)</i> | 0.096 | 0.131 | 0.101 |
| <i>Δ R² vs base model</i> | | 0.035 | 0.005 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Results

Table 5: Results of Regression Analyses Testing Short-Term (30 Days) Effects of Status on Cooperativeness

| Variable | Short-term base model (30 days) | Model 1a: Relative pay | Model 2a: All-NBA alumn. | Model 2b: Top 1% pay | Model 2c: Top 5% pay |
|--|---------------------------------|------------------------|--------------------------|----------------------|----------------------|
| <i>Superstar entry</i> | 0.277 *** | 0.159 | 0.349 *** | 0.275 *** | 0.263 *** |
| <i>Relative pay</i> | | - 0.778 *** | | | |
| <i>Superstar entry x relative pay</i> | | 0.094 | | | |
| <i>All-NBA alumnus</i> | | | - 0.932 *** | | |
| <i>Superstar entry x All-NBA alumnus</i> | | | - 0.562 * | | |
| <i>Top 1% pay</i> | | | | - 1.535 *** | |
| <i>Superstar entry x top 1% pay</i> | | | | - 0.423 * | |
| <i>Top 5% pay</i> | | | | | - 1.775 *** |
| <i>Superstar entry x top 5% pay</i> | | | | | 0.237 |
| <i>Pos.: C</i> | - 0.259 *** | - 0.023 | - 0.266 *** | - 0.242 *** | - 0.214 *** |
| <i>Pos.: PF</i> | - 0.369 *** | - 0.259 *** | - 0.368 *** | - 0.363 *** | - 0.347 *** |
| <i>Pos.: SF</i> | - 0.723 *** | - 0.560 *** | - 0.729 *** | - 0.715 *** | - 0.712 *** |
| <i>Pos.: SG</i> | - 0.714 *** | - 0.670 *** | - 0.712 *** | - 0.714 *** | - 0.700 *** |
| <i>Pos.: PG</i> | 1.342 *** | 1.429 *** | 1.337 *** | 1.348 *** | 1.342 *** |
| <i>Team tenure</i> | - 0.003 *** | - 0.001 *** | - 0.002 *** | - 0.003 *** | - 0.002 *** |
| <i>Age (days)</i> | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Constant</i> | - 2.637 *** | - 3.272 *** | - 2.847 *** | - 2.658 *** | - 2.737 *** |
| <i>No. of observations</i> | 150,452 | 150,452 | 150,452 | 150,452 | 150,452 |
| <i>Gaussian Wald chi²</i> | 3,202.13 | 4,616.26 | 3,389.03 | 26,528.77 | 3,541.02 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.205 | 0.305 | 0.215 | 0.209 | 0.227 |
| <i>R² (overall)</i> | 0.098 | 0.139 | 0.103 | 0.100 | 0.109 |
| <i>Δ R² vs base model</i> | | 0.041 | 0.005 | 0.002 | 0.011 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

To deepen my findings, I replicate the regression analyses with *cooperativeness* as the dependent variable for the short term, i.e. the first 30 days of each season, the results of which are shown in Table 5. I find the positive effect ($p < 0.01$) of *superstar entry* on *cooperativeness* to be even more pronounced as an immediate response, as the short-term base model shows. The positive relationship between *relative pay* and *cooperativeness* in the case of a superstar joining the team is less pronounced and not significant in the short term (Model 1a). However,

Results

Model 2a provides support for a slightly significant ($p < 0.10$) short-term negative effect of *All-NBA alumnus* on *cooperativeness* in line with H1. Given that *All-NBA alumnus* as a binary variable demarcates only those few players with particularly high status – 99 of 2,137 players in the sample – I replicate the analysis of Model 2a using income brackets to increase the robustness of my findings. In Model 2b, I again find a marginally significant ($p < 0.10$) negative short-term effect on *cooperativeness* in the case of superstar entry for those players who were among the NBA’s top 1% earners by salary for any given season. This effect turns positive, but insignificant, when I examine the top 5% earners (Model 2c). In conclusion, I find limited support for H1, if only in the short term and for a small group of highest-status individuals.

Table 6: Results of Regression Analyses Testing Effects of Skill Complementarity on Cooperativeness

| Variable | Base model | Model 3: <i>Position overlap</i> | Model 4: <i>Height diff.</i> |
|--------------------------------------|-------------|-------------------------------------|---------------------------------|
| <i>Position overlap</i> | | | |
| Limited overlap | | 0.150 | |
| Strong overlap | | 0.310 ** | |
| Full overlap | | - 0.065 | |
| <i>Height differential</i> | | | 4.714 ** |
| <i>Pos.: C</i> | - 0.045 | - 0.076 | - 0.027 |
| <i>Pos.: PF</i> | - 0.322 *** | - 0.384 *** | - 0.290 ** |
| <i>Pos.: SF</i> | - 0.523 *** | - 0.565 *** | - 0.494 *** |
| <i>Pos.: SG</i> | - 0.859 *** | - 0.883 *** | - 0.828 *** |
| <i>Pos.: PG</i> | 1.374 *** | 1.383 *** | 1.294 *** |
| <i>Team tenure</i> | - 0.002 *** | - 0.002 *** | - 0.002 *** |
| <i>Age (days)</i> | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Constant</i> | - 2.583 *** | - 2.605 *** | - 2.727 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 |
| <i>Gaussian Wald chi²</i> | 234.61 | 245.77 | 237.70 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.208 | 0.213 | 0.211 |
| <i>R² (overall)</i> | 0.088 | 0.090 | 0.090 |
| <i>Δ R² vs base model</i> | | 0.002 | 0.002 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

In Models 3 and 4 in Table 6, I examine the effects of *position overlap* and *height differential*, respectively, as indicators of skill complementarity on *cooperativeness*. In line with H2 predicting a positive relationship between complementarity and cooperation, I find a significant ($p < 0.05$) positive effect of *height differential* on *cooperativeness*. For the effects of *position overlap*, the findings are somewhat mixed: while full overlap appears to have a negative, yet insignificant effect, I find a significant ($p < 0.05$) positive effect of strong overlap.

To obtain a clearer perspective, the four values of *position overlap* were recoded as binary variables and analyzed individually as shown in Table 7. I find a marginally significant ($p < 0.10$) negative effect of no overlap (Model 3a) and, again, a significant ($p < 0.05$) positive effect of strong overlap (Model 3c). Neither the positive effect of limited overlap (Model 3b) nor the negative effect of full overlap (Model 3d) are found to be significant. Examining the degrees of position overlap and their effects on the individual components of *cooperativeness* (cf. Appendix A, Tables A-6, A-7, A-8, and A-9), I find that the negative effect of no overlap is driven by those players taking and missing significantly ($p < 0.01$) more shots, which overcompensates their also contributing a significantly ($p < 0.05$) higher number of assists. Players with limited position overlap with the superstar contribute significantly ($p < 0.01$) fewer assists, but also take and miss significantly ($p < 0.01$) fewer shots, which results in the insignificant effect on *cooperativeness*. Players with strong overlap miss slightly significantly ($p < 0.10$) fewer shots without a significant change in the number of assists they contribute, resulting in an overall positive effect on *cooperativeness*. Players with full overlap, finally, do not respond to the superstar joining by giving significantly fewer or more assists or attempting significantly fewer or more shots; however, I observe a significant ($p < 0.05$) negative effect on shooting precision, i.e. field goals scored divided by field goal attempts, indicating that players with full overlap tend to take more risky shots when a superstar joins the team.

*Results***Table 7: Details on Effects of *Position Overlap* on *Cooperativeness***

| Variable | Model 3a: <i>No overlap</i> | Model 3b: <i>Limited overlap</i> | Model 3c: <i>Strong overlap</i> | Model 3d: <i>Full overlap</i> |
|--------------------------------------|--------------------------------|-------------------------------------|------------------------------------|----------------------------------|
| <i>Position overlap</i> | | | | |
| No overlap | - 0.178 * | | | |
| Limited overlap | | 0.068 | | |
| Strong overlap | | | 0.284 ** | |
| Full overlap | | | | - 0.173 |
| <i>Pos.: C</i> | - 0.102 | - 0.048 | - 0.156 | - 0.017 |
| <i>Pos.: PF</i> | - 0.368 *** | - 0.333 *** | - 0.354 *** | - 0.326 *** |
| <i>Pos.: SF</i> | - 0.554 *** | - 0.530 *** | - 0.546 *** | - 0.525 *** |
| <i>Pos.: SG</i> | - 0.896 *** | - 0.871 *** | - 0.857 *** | - 0.854 *** |
| <i>Pos.: PG</i> | 1.361 *** | 1.369 *** | 1.389 *** | 1.383 *** |
| <i>Team tenure</i> | - 0.002 *** | - 0.002 *** | - 0.002 *** | - 0.002 *** |
| <i>Age (days)</i> | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Constant</i> | - 2.419 *** | - 2.578 *** | - 2.616 *** | - 2.577 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 | 55,217 |
| <i>Gaussian Wald chi²</i> | 236.15 | 234.85 | 239.68 | 241.33 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.210 | 0.208 | 0.212 | 0.208 |
| <i>R² (overall)</i> | 0.089 | 0.088 | 0.089 | 0.089 |
| <i>Δ R² vs base model</i> | 0.001 | < 0.001 | 0.001 | 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

In sum, I find support for H2 based on *height differential*, whereas the implications of *position overlap* for cooperativeness require differentiated consideration.

2.5.2 Effort

To test H3, I examine the short-term effect of status on *effort* using *relative pay* and *All-NBA alumnus* as independent variables in Models 5 and 6, respectively, as described in Table 8. Since I do not find a significant effect in either of the two models for the 30-day period following superstar entry, I further shorten the time period to only cover 15 days in Model 5a. As predicted by H3, *relative pay* significantly ($p < 0.05$) and positively affects *effort* as an immediate response to a superstar joining the team. The positive effect of *All-NBA alumnus*, however, is still not significant.

*Results***Table 8: Results of Regression Analyses Testing Short-Term (30/15 Days) Effects of Status on *Effort***

| Variable | Short-term base model (30 days) | Model 5: <i>Relative pay</i> | Model 6: <i>All-NBA alumnus</i> | Short-term base model (15 days) | Model 5a: <i>Relative pay</i> | Model 6a: <i>All-NBA alumnus</i> |
|--|---------------------------------------|---------------------------------|--|---------------------------------------|----------------------------------|---|
| <i>Superstar entry</i> | - 0.005 ** | - 0.008 ** | - 0.007 *** | - 0.006 ** | - 0.011 *** | - 0.008 *** |
| <i>Relative pay</i> | | - 0.001 * | | | 0.001 | |
| <i>Superstar entry x relative pay</i> | | 0.003 | | | 0.005 ** | |
| <i>All-NBA alumnus</i> | | | 0.011 *** | | | 0.011 *** |
| <i>Superstar entry x All-NBA alumnus</i> | | | 0.011 | | | 0.015 |
| <i>Pos.: C</i> | 0.035 *** | 0.034 *** | 0.035 *** | 0.034 *** | 0.034 *** | 0.034 *** |
| <i>Pos.: PF</i> | 0.006 *** | 0.006 *** | 0.006 *** | 0.005 *** | 0.005 *** | 0.005 *** |
| <i>Pos.: SF</i> | - 0.011 *** | - 0.011 *** | - 0.011 *** | - 0.011 *** | - 0.011 *** | - 0.011 *** |
| <i>Pos.: SG</i> | - 0.018 *** | - 0.018 *** | - 0.018 *** | - 0.019 *** | - 0.019 *** | - 0.019 *** |
| <i>Pos.: PG</i> | - 0.033 *** | - 0.033 *** | - 0.033 *** | - 0.034 *** | - 0.034 *** | - 0.034 *** |
| <i>Team tenure</i> | 0.000 ** | 0.000 | 0.000 | 0.000 * | 0.000 | 0.000 |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 0.161 *** | 0.162 *** | 0.164 *** | 0.163 *** | 0.163 *** | 0.165 *** |
| <i>No. of observations</i> | 150,452 | 150,452 | 150,452 | 81,600 | 81,600 | 81,600 |
| <i>Gaussian Wald chi²</i> | 5,600.17 | 5,771.77 | 5,646.43 | 3,817.62 | 4,023.91 | 3,851.44 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.219 | 0.219 | 0.220 | 0.159 | 0.160 | 0.160 |
| <i>R² (overall)</i> | 0.071 | 0.071 | 0.072 | 0.062 | 0.062 | 0.062 |
| <i>Δ R² vs base m.</i> | | < 0.001 | 0.001 | | < 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

To build a more profound understanding of how *effort* develops over the course of the first weeks after superstar entry, I include *days* as a time variable and compare two different income groups of individuals – the top 1% earners, on the one hand, and all others, on the other hand – in terms of their *effort* over the first 30 days of a season. I leave all observations outside of the superstar entry scenario aside to avoid unmanageable complexity. Given that both the theory and our initial results indicate *effort* levels to experience a short burst followed by a return to

Results

lower levels, I include the linear, squared and cubic terms for *days* to accommodate for the expected non-linear development. The results of the analysis are described in Table 9.

Table 9: Results of Alternative Regression Analyses Testing Short-Term (30 Days) Effects of Status on *Effort*

| Variable | Short-term base model (30 days, time-variant) | Model 7: <i>Top 1% pay</i> |
|--|--|---------------------------------------|
| <i>Days</i> | 0.003 * | 0.003 * |
| <i>Days</i> ² | - 0.000 * | - 0.000 * |
| <i>Days</i> ³ | 0.000 | 0.000 |
| <i>Top 1% pay</i> | | 0.062 *** |
| <i>Days x top 1% pay</i> | | 0.008 *** |
| <i>Days</i> ² <i>x top 1% pay</i> | | - 0.001 *** |
| <i>Days</i> ³ <i>x top 1% pay</i> | | 0.000 *** |
| <i>Pos.: C</i> | 0.027 *** | 0.026 *** |
| <i>Pos.: PF</i> | 0.014 ** | 0.015 ** |
| <i>Pos.: SF</i> | - 0.024 *** | - 0.024 *** |
| <i>Pos.: SG</i> | - 0.013 ** | - 0.013 ** |
| <i>Pos.: PG</i> | - 0.032 *** | - 0.032 *** |
| <i>Team tenure</i> | 0.000 | 0.000 |
| <i>Age (days)</i> | - 0.000 | - 0.000 |
| <i>Constant</i> | 0.116 *** | 0.117 *** |
| <i>No. of observations</i> | 3,912 | 3,912 |
| <i>Gaussian Wald chi</i> ² | 181.30 | 202.65 |
| <i>R</i> ² (<i>within</i>) | 0.001 | 0.001 |
| <i>R</i> ² (<i>between</i>) | 0.286 | 0.289 |
| <i>R</i> ² (<i>overall</i>) | 0.094 | 0.095 |
| ΔR^2 vs base m. | | 0.001 |

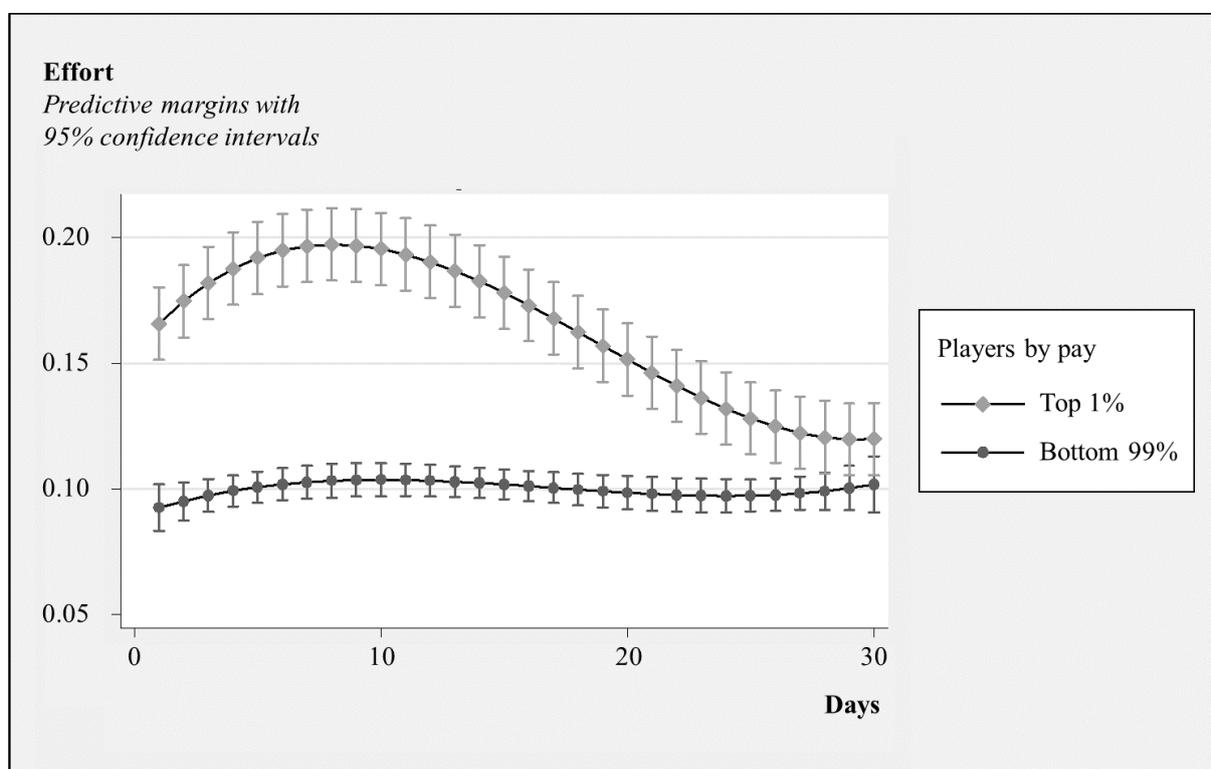
Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

As Model 7 shows, the interaction terms of the pay brackets with the linear, squared, and cubic terms of *days* are all significant ($p < 0.01$), even though including them only very moderately increases the explanatory power of Model 7 compared to the base model. Figure 4 graphically summarizes the resulting development of *effort* in the two pay brackets over time: While most members do not appear to adjust their *effort* levels as a consequence of a superstar's joining the

Results

team, the top earners in elevated status positions start off the new season with significantly enhanced drive that peaks at around seven to ten days into the season at around twice as many *effort*-related actions per minute compared to lower-status teammates, before it decreases and approaches the level of the other team members after as little as a month. In sum, I thus find some, yet not particularly robust, empirical evidence of a short-term positive effect of status on *effort* in the superstar entry scenario in line with H3.

Figure 4: Short-Term Fluctuations in *Effort* as a Function of *Relative Pay* in the Superstar Entry Scenario



The results of my testing the hypothesized negative relationship between status and *effort* in the longer term after superstar entry according to H4 are described in Table 10. Both for *relative pay* (Model 8) and *All-NBA alumnus* (Model 9) as independent variables, I do not find the observed negative effects to be significant, leading to the rejection of H4.

*Results***Table 10: Results of Regression Analyses Testing Long-Term (> 30 Days) Effects of Status on *Effort***

| Variable | Long-term base model | Model 8: <i>Relative pay</i> | Model 9: <i>All-NBA alumnus</i> |
|--|----------------------|---------------------------------|------------------------------------|
| <i>Superstar entry</i> | - 0.001 | 0.001 | - 0.001 |
| <i>Relative pay</i> | | 0.000 | |
| <i>Superstar entry x relative pay</i> | | - 0.002 | |
| <i>All-NBA alumnus</i> | | | 0.012 *** |
| <i>Superstar entry x All-NBA alumnus</i> | | | - 0.002 |
| <i>Pos.: C</i> | 0.033 *** | 0.032 *** | 0.033 *** |
| <i>Pos.: PF</i> | - 0.006 *** | 0.006 *** | 0.006 *** |
| <i>Pos.: SF</i> | - 0.012 *** | - 0.012 *** | - 0.011 *** |
| <i>Pos.: SG</i> | - 0.018 *** | - 0.018 *** | - 0.018 *** |
| <i>Pos.: PG</i> | - 0.033 *** | - 0.033 *** | - 0.033 *** |
| <i>Team tenure</i> | 0.000 | 0.000 | - 0.000 |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 0.155 *** | 0.155 *** | 0.158 *** |
| <i>No. of observations</i> | 538,228 | 538,228 | 538,228 |
| <i>Gaussian Wald chi²</i> | 8,207.01 | 8,212.74 | 8,293.74 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.289 | 0.289 | 0.291 |
| <i>R² (overall)</i> | 0.090 | 0.090 | 0.090 |
| <i>Δ R² vs base model</i> | | < 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 11 summarizes the results of the regressions testing the effects of *position overlap* as an ordinal measure of skill complementarity on *effort*. Over the course of a full season, I only find weak evidence of a significant ($p < 0.10$) negative effect of full overlap (Model 10). To develop a better understanding of this observation, I extend my analysis to also separately cover the short-term periods of 15 and 30 days (Models 10a and 10b, respectively), which have proven useful in previous analyses. In addition, I rerun the analysis applying the four values of *position overlap* recoded as binary variables, the results of which are shown in Table 12.

*Results***Table 11: Results of Regression Analyses Testing Effects of *Position Overlap* on *Effort***

| Variable | Model 10: <i>Position overlap (season)</i> | Model 10a: <i>Position overlap (30 days)</i> | Model 10b: <i>Position overlap (15 days)</i> |
|---|---|---|---|
| <i>Position overlap</i> | | | |
| Limited overlap | 0.004 | 0.009 * | 0.016 ** |
| Strong overlap | 0.001 | 0.000 | 0.001 |
| Full overlap | - 0.007 * | - 0.011 ** | - 0.007 |
| <i>Pos.: C</i> | 0.031 *** | 0.037 *** | 0.031 *** |
| <i>Pos.: PF</i> | 0.010 *** | 0.007 * | 0.006 |
| <i>Pos.: SF</i> | - 0.015 *** | - 0.016 *** | - 0.016 *** |
| <i>Pos.: SG</i> | - 0.019 *** | - 0.019 *** | - 0.026 *** |
| <i>Pos.: PG</i> | - 0.028 *** | - 0.029 *** | - 0.031 *** |
| <i>Team tenure</i> | 0.000 ** | 0.000 | 0.000 |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 ** |
| <i>Constant</i> | 0.148 *** | 0.136 *** | 0.138 *** |
| <i>No. of observations</i> | 55,217 | 11,328 | 6,171 |
| <i>Gaussian Wald chi²</i> | 795.00 | 463.57 | 364.93 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.362 | 0.263 | 0.205 |
| <i>R² (overall)</i> | 0.081 | 0.094 | 0.088 |
| <i>Δ R² vs base model¹⁰</i> | < 0.001 | 0.002 | 0.002 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

The findings I obtain are somewhat mixed. In line with H5, I find evidence of significant positive effects of limited overlap for the 30-day ($p < 0.05$) and 15-day ($p < 0.01$) periods. However, contrary to H5, strong position overlap does not have a significant effect. What is more, full overlap appears to have a significant ($p < 0.05$) and negative effect on *effort*, both over the course of an entire season and particularly within the first 30 days after superstar entry.

Table 12: Details on Effects of *Position Overlap* on *Effort* (Main Effects Only)

| Time horizon | <i>No overlap</i> | <i>Limited overlap</i> | <i>Strong overlap</i> | <i>Full overlap</i> |
|----------------------|--------------------------|-------------------------------|------------------------------|----------------------------|
| Season | - 0.000 | 0.003 | 0.001 | - 0.008 ** |
| Short term (30 days) | - 0.001 | 0.011 ** | - 0.000 | - 0.012 ** |
| Short term (15 days) | - 0.005 | 0.017 *** | - 0.001 | - 0.010 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

¹⁰Please find the corresponding base models in Appendix A, Table A-10.

Results

The results are equally mixed for the second operationalization of skill complementarity, *height differential*, and its effect on *effort*. Again, I do not find the hypothesized effect to be significant over the course of a full season, as Model 11 in Table 13 shows. When examining shorter time periods, however, the effect becomes more pronounced (Model 11a) and is marginally significant ($p < 0.10$) for the 15-day period (Model 11b). Taking everything into consideration, there is some evidence for H5 to hold in the very short term immediately after the superstar transfer, which, however, needs to be treated with caution given the partially contradicting findings for full position overlap.

Table 13: Results of Regression Analyses Testing Effects of Height Differential on Effort

| Variable | Model 11: <i>Height differential (season)</i> | Model 11a: <i>Height differential (30 days)</i> | Model 11b: <i>Height differential (15 days)</i> |
|---|--|--|--|
| <i>Height differential</i> | - 0.036 | - 0.056 | - 0.123 * |
| <i>Pos.: C</i> | 0.030 *** | 0.036 *** | 0.030 *** |
| <i>Pos.: PF</i> | 0.011 *** | 0.008 * | 0.009 |
| <i>Pos.: SF</i> | - 0.015 *** | - 0.015 *** | - 0.015 *** |
| <i>Pos.: SG</i> | - 0.019 *** | - 0.018 *** | - 0.024 *** |
| <i>Pos.: PG</i> | - 0.028 *** | - 0.028 *** | - 0.027 *** |
| <i>Team tenure</i> | 0.000 *** | 0.000 | 0.000 |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 ** |
| <i>Constant</i> | 0.149 *** | 0.137 *** | 0.140 *** |
| <i>No. of observations</i> | 55,217 | 11,328 | 6,171 |
| <i>Gaussian Wald chi²</i> | 865.88 | 469.69 | 362.60 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.359 | 0.256 | 0.197 |
| <i>R² (overall)</i> | 0.081 | 0.093 | 0.086 |
| <i>Δ R² vs base model¹¹</i> | < 0.001 | 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

¹¹Please find the corresponding base models in Appendix A, Table A-10.

2.5.3 Performance

Tables 14 and 15 display the results of the regression analyses using *efficiency* as the dependent variable to measure individual player performance. I neither find a significant effect for status, operationalized through *relative income* (Model 12) and *All-NBA alumnus* (Model 13), nor for skill complementarity, operationalized through *position overlap* (Model 14) and *height differential* (Model 15), in the superstar entry scenario, resulting in the rejection of H6 and H7.

Table 14: Results of Regression Analyses Testing Effects of Status on *Efficiency*

| Variable | Base model | Model 12: <i>Relative pay</i> | Model 13: <i>All-NBA team</i> |
|--|-------------|----------------------------------|----------------------------------|
| <i>Superstar entry</i> | - 0.005 | - 0.011 | - 0.008 |
| <i>Relative pay</i> | | 0.051 *** | |
| <i>Superstar entry x relative pay</i> | | 0.007 | |
| <i>All-NBA alumnus</i> | | | 0.132 *** |
| <i>Superstar entry x All-NBA alumnus</i> | | | 0.014 |
| <i>Position overlap</i> | | | |
| Limited overlap | | | |
| Strong overlap | | | |
| Full overlap | | | |
| <i>Height differential</i> | | | |
| <i>Pos.: C</i> | 0.048 *** | 0.033 *** | 0.049 *** |
| <i>Pos.: PF</i> | 0.033 *** | 0.026 *** | 0.033 *** |
| <i>Pos.: SF</i> | - 0.005 | - 0.015 *** | - 0.004 |
| <i>Pos.: SG</i> | - 0.019 *** | - 0.022 *** | - 0.019 *** |
| <i>Pos.: PG</i> | 0.011 *** | 0.006 * | 0.011 *** |
| <i>Team tenure</i> | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Age (days)</i> | - 0.000 *** | 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 0.449 *** | 0.490 *** | 0.478 *** |
| <i>No. of observations</i> | 688,680 | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 1,206.27 | 3,602.68 | 2,424.66 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.092 | 0.145 | 0.113 |
| <i>R² (overall)</i> | 0.018 | 0.030 | 0.024 |
| <i>Δ R² vs base model</i> | | 0.012 | 0.006 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

*Results***Table 15: Results of Regression Analyses Testing Effects of Skill Complementarity on Efficiency**

| Variable | Base model | Model 14: <i>Position overlap</i> | Model 15: <i>Height diff.</i> |
|--------------------------------------|------------|--------------------------------------|----------------------------------|
| <i>Position overlap</i> | | | |
| Limited overlap | | 0.042 | |
| Strong overlap | | - 0.017 | |
| Full overlap | | - 0.010 | |
| <i>Height differential</i> | | | - 0.046 |
| <i>Pos.: C</i> | 0.071 *** | 0.072 *** | 0.071 *** |
| <i>Pos.: PF</i> | 0.074 *** | 0.069 *** | 0.074 *** |
| <i>Pos.: SF</i> | - 0.007 | - 0.011 | - 0.008 |
| <i>Pos.: SG</i> | - 0.007 | - 0.014 | - 0.007 |
| <i>Pos.: PG</i> | 0.026 * | 0.023 * | 0.027 * |
| <i>Team tenure</i> | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Age (days)</i> | - 0.000 | - 0.000 | - 0.000 |
| <i>Constant</i> | 0.333 *** | 0.338 *** | 0.334 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 |
| <i>Gaussian Wald chi²</i> | 39.42 | 113.48 | 50.93 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.061 | 0.065 | 0.061 |
| <i>R² (overall)</i> | 0.009 | 0.009 | 0.009 |
| <i>Δ R² vs base model</i> | | < 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

When I focus on individual pay brackets rather than *relative pay* as a continuous measure of status (Table 16), however, I observe a significant ($p < 0.01$) positive effect for players in the top income percentile without a significant effect for the rest of the team (Model 13a), when a superstar is added to the roster. This effect loses both significance and amplitude when I broaden the cluster of high-status players to include the top 5% ($p < 0.10$, Model 13b) and top 10% ($p < 0.05$, Model 13c) of the league's players by income and turns insignificant when the top quartile is considered. Contrary to H6, I thus find that those players with the highest status by income show significant performance improvements when a superstar joins the team, even though this effect is limited to those players at the top of the team's pay and social hierarchies.

*Results***Table 16: Details on Effects of Status on *Efficiency***

| Variable | Model 13a: <i>Top 1% pay</i> | Model 13b: <i>Top 5% pay</i> | Model 13c: <i>Top 10% pay</i> | Model 13d: <i>Top 25% pay</i> |
|--|---|---|--|--|
| <i>Superstar entry</i> | - 0.005 | - 0.006 | - 0.008 | - 0.005 |
| <i>Top 1% pay</i> | 0.115 *** | | | |
| <i>Superstar entry x top 1% pay</i> | 0.105 *** | | | |
| <i>Top 5% pay</i> | | 0.109 *** | | |
| <i>Superstar entry x top 5% pay</i> | | 0.078 * | | |
| <i>Top 10% pay</i> | | | 0.103 *** | |
| <i>Superstar entry x top 10% pay</i> | | | 0.040 ** | |
| <i>Top 25% income</i> | | | | 0.082 *** |
| <i>Superstar entry x top 25% pay</i> | | | | 0.012 |
| <i>Pos.: C</i> | 0.047 *** | 0.045 *** | 0.044 *** | 0.042 *** |
| <i>Pos.: PF</i> | 0.033 *** | 0.032 *** | 0.031 *** | 0.030 *** |
| <i>Pos.: SF</i> | - 0.005 * | - 0.006 * | - 0.006 ** | - 0.009 *** |
| <i>Pos.: SG</i> | - 0.019 *** | - 0.020 *** | - 0.020 *** | - 0.019 *** |
| <i>Pos.: PG</i> | 0.010 *** | 0.011 *** | 0.011 *** | 0.010 *** |
| <i>Team tenure</i> | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 0.451 *** | 0.455 *** | 0.458 *** | 0.467 *** |
| <i>No. of observations</i> | 688,680 | 688,680 | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | > 100,000 | 1,935.91 | 2,513.17 | 3,169.98 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.094 | 0.102 | 0.109 | 0.117 |
| <i>R² (overall)</i> | 0.019 | 0.021 | 0.023 | 0.024 |
| <i>Δ R² vs base model</i> | 0.001 | 0.003 | 0.004 | 0.005 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

This positive effect of a superstar's joining the team on highest-status players' performance receives further empirical support, when *days* as a time variable is included in the analysis in Table 17. While the base model without differentiation by income brackets does not yield significant effects in the superstar entry scenario, this changes considerably when the binary variable to distinguish the highest earning percent of all players as well as its interaction terms with *superstar entry* and *days* is included in Model 16: The best paid individuals in the sample

Results

do not only perform significantly better compared to their lower-pay peers, but the difference almost doubles in the superstar entry scenario as described by the interaction term between *superstar entry* and the pay bracket dummy variable.

Table 17: Results of Alternative Regression Analyses Testing Effects of Status on Efficiency

| Variable | Base model (time variant) | Model 16: Top 1% pay |
|--|--------------------------------------|---------------------------------|
| <i>Superstar entry</i> | 0.001 | 0.000 |
| <i>Days</i> | 0.000 ** | 0.000 *** |
| <i>Superstar entry x days</i> | - 0.000 | - 0.000 |
| <i>Top 1% pay</i> | | 0.115 *** |
| <i>Superstar entry x top 1% pay</i> | | 0.114 *** |
| <i>Days x top 1% pay</i> | | 0.000 |
| <i>Superstar entry x days x top 1% pay</i> | | - 0.000 *** |
| <i>Pos.: C</i> | 0.048 *** | 0.047 *** |
| <i>Pos.: PF</i> | 0.033 *** | 0.035 *** |
| <i>Pos.: SF</i> | - 0.005 * | - 0.005 * |
| <i>Pos.: SG</i> | - 0.019 *** | - 0.017 *** |
| <i>Pos.: PG</i> | 0.011 *** | 0.010 *** |
| <i>Team tenure</i> | 0.000 *** | 0.000 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 0.448 *** | 0.448 *** |
| <i>No. of observations</i> | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 1,219.53 | 2,465.60 |
| <i>R² (within)</i> | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.093 | 0.089 |
| <i>R² (overall)</i> | 0.018 | 0.019 |
| <i>Δ R² vs base model</i> | | 0.001 |

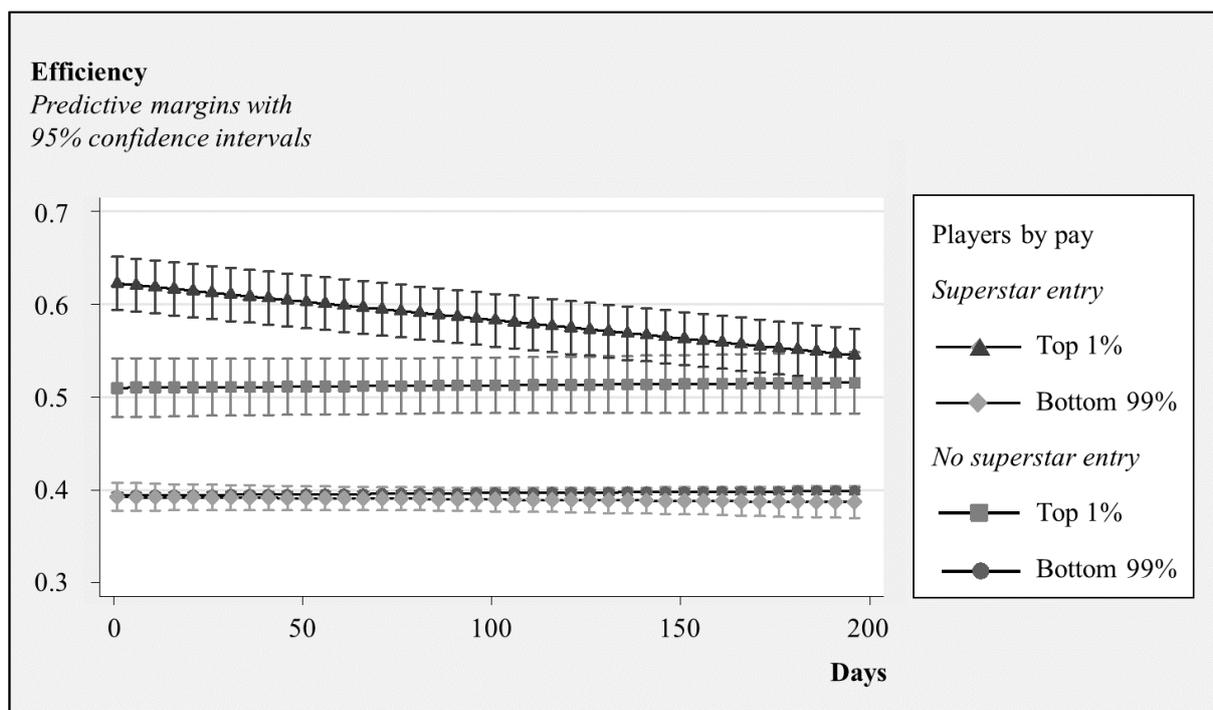
Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

However, this additional effect in the superstar entry scenario slightly declines over time, as the significant ($p < 0.01$) and negative triple interaction term of *superstar entry*, *days*, and pay bracket shows. This also becomes evident in Figure 5, which graphically describes the

Results

relationship between *superstar entry*, *days*, pay brackets, and *efficiency* over the course of an entire season. While lower-pay team members’ performance is not significantly affected by *superstar entry*, the highest-pay individuals perform considerably better at the beginning of the season when a superstar joins the team than without such a change to team composition. However, this performance differential declines over time and appears to lose significance towards the final third of the season. Nevertheless, contrary to H6, the highest-status incumbent team members tend to experience a prolonged performance enhancement over most of a given season when a superstar joins their team.

Figure 5. Full-Season Development of *Efficiency* as a Function of Status



2.6 Discussion

This study developed and tested hypotheses to examine the effects of a superstar joining a team on each incumbent team member’s cooperation, effort, and performance as a function of their

individual characteristics in terms of status and skill complementarity with the superstar. I used a comprehensive panel dataset from the NBA to detect even short-period variations covering as little as a few weeks and to simultaneously exploit the manifoldness of the available performance measures, allowing me to isolate the main effects by controlling for potential confounding factors.

I found that high-status individuals respond to a superstar joining their team with sustainably higher levels of cooperation and a short burst of effort that disappears after two weeks in the new team set-up. Those few individuals at the absolute pinnacle of the team's social hierarchy, however, tend to reduce their cooperation as an immediate reaction in the very short term, but show higher performance levels for extended periods of time after that, which demonstrates some of the facets of how status sorting occurs and of how status conflicts emerge and develop. Furthermore, I find skill complementarity to positively and sustainably influence cooperation after a superstar's joining, while stronger skill overlap leads to higher effort as an immediate reaction to the transfer. However, both these effects appear to be slightly curvilinear, with medium levels of overlap leading to the most positive outcomes. Finally, skill complementarity does not appear to significantly influence how a superstar joining the team affects individual-level performance.

2.6.1 Theoretical Implications

H1 and H1_{alt} reflected two different theoretical perspectives on how status conflicts manifest in teams. On the one hand, it has been argued that status conflicts undermine the sharing of information and other resources (Bendersky and Hays 2012, Bunderson and Reagans 2011), which I will call overt status conflict and which I expected to lead to lower levels of cooperation.

On the other hand, Anderson and Kilduff (2009a) argue that individuals attempt to come out on top in the status sorting process by enhancing their perceived value contribution to the team through displays of excessive commitment and support. While the authors have not used the term ‘status conflict’ to describe this rather serene process, I believe that it represents a more subtle form of “disputes over people’s relative status positions in their group’s social hierarchy” (Bendersky and Hays 2012: p. 323), which I will consequentially call covert status conflict. In addition, Anderson et al. (2012) find that members infer what status position they are expected to occupy in the team in accordance with their perceived value contributions and that they tend to comply with these expectations. The arguments brought forward by both Anderson and Kilduff (2009a) and Anderson et al. (2012) let me expect status to be associated with more positive reactions in terms of cooperation, as high-status individuals move into more supportive roles as a reaction to the superstar joining the team, while low-status individuals do not adapt their behavior significantly.

Based on my detailed analysis of the status sorting process following a superstar transfer, rather than just of its ultimate outcome, I argue that both overt and covert manifestations of status conflict become visible, albeit in the behavioral patterns of different categories of high-status individuals: only those individuals in direct proximity to the incoming superstar – in my case, current and former All-NBA players and the top 1% earners – engage in overt status conflicts in that they more strongly engage in uncooperative actions, such as taking more risky shots on the court. However, these overt status conflicts are temporary and appear to be resolved after as little as two weeks. For all other team members, the status differential to the superstar seems to be too high to begin with – they do not visibly compete for status with the superstar, but rather defer to a permanently more supportive role, resulting in higher levels of cooperation. However, I believe they do so, to some extent, in an attempt to defend their relative positions

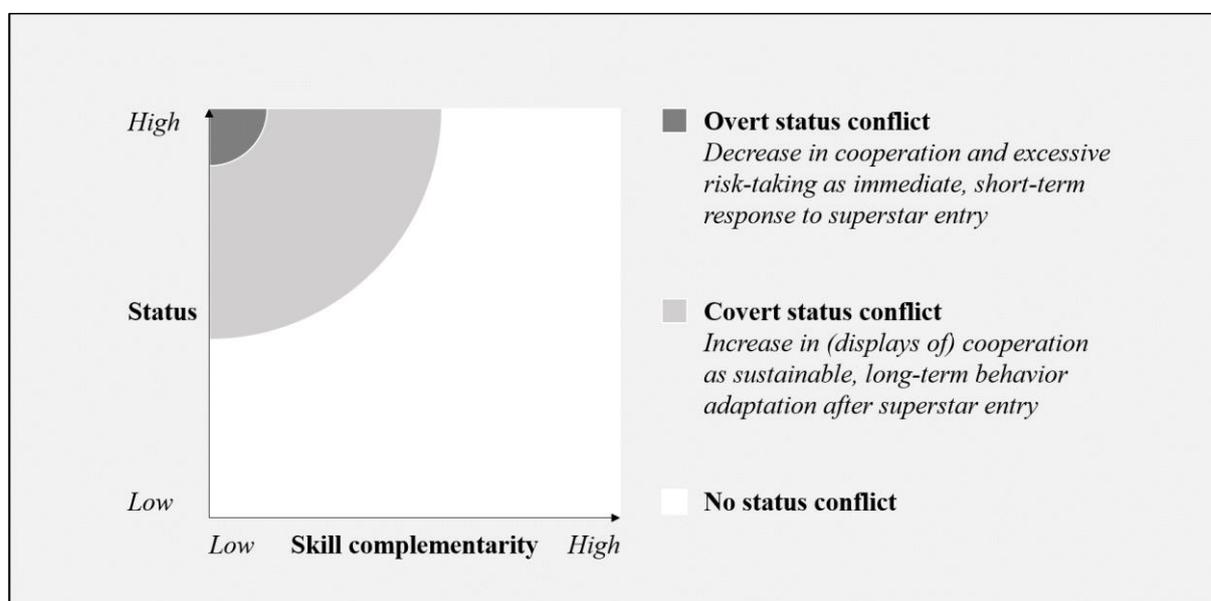
vis-à-vis other incumbent team members: once a high-status individual is forced out of his status position by a new superstar and no longer possesses a clear role in the team, lower-status teammates may try to exploit the opportunity and climb past them in the social hierarchy. To protect his relative position, the high-status individual must show that his relative value contribution is still higher than that of his lower-status peers even in the new, more supportive role, and he does so by displaying high – and potentially even excessive – levels of cooperation.

Similarly, I observe a positive link between skill complementarity and cooperation, albeit with an apparently non-linear effect of different degrees of overlap. I infer that only team members whose skills completely overlap with those of the superstar engage in overt status conflict, resulting in reduced cooperation as indicated by their seemingly taking riskier shots. For team members with strong overlap, by contrast, I find a significant positive effect on cooperation, which I classify as a sign of covert status conflict. The lack of a significant effect for individuals with limited overlap, finally, shows that these team members do not tend to fundamentally adapt their cooperation behavior given that their position in the team's hierarchy is not threatened due to their specialized role vis-à-vis the superstar.

Figure 6 conceptually summarizes the relationship between the types of status conflicts I observe and team member characteristics in terms of their status positions in the team's social hierarchy and the complementarity of their skills compared to the superstar. Only individuals who are very close in terms of status and/or skills will engage in overt status conflict with the superstar, but will do so only for short periods of time. I believe that the brevity of the overt reaction is primarily driven by implicit and explicit feedback mechanisms, such as teammates siding with the superstar whose value contribution they perceive to be higher, which makes the focal individual withdraw from the conflict in a 'like it or not' manner. Individuals with some distance to the incoming superstar in terms of status and skill-set, by contrast, will only engage

in covert status conflicts. Being aware of the expectations of their environment concerning their relative value contributions (Anderson et al. 2012), they accept a subordinate role and leave the top spot in the social hierarchy to the superstar. Nevertheless, they will attempt to provide evidence of high value contributions in their new roles in order to defend their relative positions compared to other incumbent team members and potential non-star newcomers, resulting in sustainably higher levels of cooperation.

Figure 6: Types of Status Conflicts at Different Levels of Member Status and Skill Complementarity



Individual players’ effort is found to be significantly affected by *superstar entry* only in the very short term up to half a month following the transfer, and this effect is positively associated with player status, but negatively associated with skill complementarity with the superstar. This reflects the group-level observation made by Scheepers et al. (2009) who state that threat to status has been found to lead to either enhanced effort or emotional withdrawal. Following Tauer and Harackiewicz (2004), who argue that only “appropriate competition” (p. 850) enhances intrinsic motivation and that a realistic chance of winning is a vital prerequisite for

that, I interpret from my findings that only players with status similar to that of the superstar have a realistic chance of defending their positions against the newcomer no matter what their role on the court is, whereas lower-status individuals occupying the same position do not. As a consequence, the former are intrinsically motivated to defend their positions with enhanced effort, whereas the latter perceive the challenge as unfair, given their vanishingly small chance of coming out on top, and abate their efforts.

What is more, the temporary nature of these fluctuations in effort gives a strong indication that, by and large, individuals in my research setting continuously perform at the highest effort level that is sustainable for them in the long term and from which they are unable or unwilling to deviate for extended periods of time. Even though players may be able to push themselves to higher effort levels for a few games, physical and mental barriers will gradually make them regress to their long-term means. Likewise, players who reduce their effort in response to their status position being threatened by a superstar with whom they can simply not cope will soon be induced by their own drive as well as feedback by teammates, coaches, and other stakeholders to ‘make the best out of it’ and display their usual levels of effort. I believe this observation to be equally valid for other high-performance organizations outside the realm of sports, such as professional service firms.

An individual player’s performance development in the superstar entry scenario appears to be largely independent from his status and skill-set complementarity – none of my independent variables led to a significant effect on performance, be it in the short or long term. If anything, I find that players in the highest income brackets benefit from a superstar newcomer in their long-term performance. Rather than status-based considerations, however, I believe that human capital theory provides the best explanation for this result. Several studies have shown that a group of highly talented individuals is able to produce outcomes that exceed what would be

expected from their aggregate individual performances alone and that high-ability members perform better in teams with other homogeneously high-ability members than with low-ability members (Elberse 2007, Tziner and Eden 1985, Egerbladh 1976). The reasoning is that a significant part of what constitutes an individual's performance resides not within that individual itself but, amongst others, in interpersonal relations with colleagues (Groysberg and Lee 2010, 2008). Accordingly, a superstar joining the team will provide highly valuable interpersonal relations to incumbent players and those with the highest ability will benefit most from these relations. Assuming that ability is among the predominant determinants of income, this consideration explains why only the performance of those players in the highest income brackets sustainably increases after a superstar transfer.

Even though this finding is not new with respect to team composition, the context adds relevant insights to the study of superstar transfers. Up to this point, there has been considerable agreement that hiring outside superstars tends to destroy value, because the hiring firm is likely to overpay and the superstar consistently and permanently fails to live up to his former performance levels due to a significant fraction of the human capital attributed to him being firm-specific to his previous employer (Bidwell 2012, Groysberg and Lee 2009, Groysberg et al. 2008). My results suggest that future research into the value implications of superstar transfers should include their effects on the performance of all members of the organization beyond the superstar himself. Even though I do not question the performance decline the superstar is likely to experience, I believe that this negative effect may be compensated by a corresponding positive effect on the performance of colleagues in the star's direct environment, which may in sum result in a positive net effect on organizational value. For example, Kevin Garnett, who was honored as the MVP of the 2003/04 regular season, experienced a significant decline in his average numbers of points, assists, rebounds, and blocks per game when he joined

the Boston Celtics for the 2007/08 season. Nevertheless, he is broadly considered one of the key players contributing to his club's winning the NBA championship in that year for the first time since 1986¹². Therefore, I strongly advocate taking the performance developments of all team members – rather than just of the superstar himself – into consideration when analyzing the human capital implications of superstar transfers from one organization to another.

My contribution to the literature is hence threefold. First and foremost, I add clarity to the research into team compositions and their performance implications as well as into status theory by classifying two types of status conflicts, overt and covert status conflict, by describing under what circumstances they occur, and by providing insights into their consequences. Second, I characterize the motivational implications of status conflicts in terms of effort and show their extreme transience by means of my unique longitudinal dataset. Finally, I show how research into the portability of human capital and talent may benefit from taking not only the performance implications for the star being transferred into account, but also the wider consequences for the surrounding work environment.

2.6.2 Limitations

A number of limitations to this study should be addressed in future research. First, the advantage of a large-scale longitudinal sample from a real-life sporting competition brings with it the issue of indirect measures for a number of constructs. For example, cooperation – or, more specifically, an individual's tendency to choose cooperative action that benefits the team rather than the individual over egoistic action – cannot be measured directly and exhaustively. Rather,

¹²However, out of the 35 MVP transfers in the observation period, this was the only example of a club's hiring a superstar being followed by that club's winning the NBA championship in the same season. On average, clubs tended to – at best – maintain their league positions when being joined by a superstar.

my analysis builds on the measurable performance outcomes that stem from such choices. Likewise, I rely on public measures of status, namely awards and income, to reconstruct the internal social hierarchy of the team, which is likely to “be determined by group needs, and as such the individual’s status may look very different when observed from within the group” (Overbeck et al. 2005: p. 170). While I am confident that the observed effects substantiate my theoretical conclusions, replicating them in the controlled environment of a laboratory study may prove valuable.

Second, one could argue that an exhaustive difference-in-differences approach ought to compare the superstar entry scenario not only with one, but with two other scenarios: one in which a non-superstar player joins the team and one in which the team composition remains unchanged. This would allow to more clearly differentiate between the effects of team composition changes in general and the effects of a superstar joining the team in particular. However, due to the structural characteristics of the NBA, such as the draft and trade systems, no team has stayed entirely unchanged between any two seasons within the observation period. As a result, the latter scenario could not be included in the analysis for the lack of corresponding data. I am convinced, however, that the resulting constellation with only two scenarios – superstar entry and no superstar entry – does not undermine the accuracy and validity of my findings. Rather, it further stresses their relevance, given that – even in an environment in which actors are accustomed to continuous changes in team composition – a superstar’s joining a new team provokes observable and unique behavioral responses.

Third, a club’s decision to hire a superstar may coincide with – or even result from – other fundamental strategic decisions, such as replacing the head coach, relocating to another city, or drastically increasing the budgeted payroll. Each of these decisions has the potential to significantly affect a team’s game plan and to eventually trickle down into each individual team

member's performance metrics. Even though I cannot entirely rule out the possibility of systematic errors as a result of other strategic decisions that may or may not disproportionately often coincide with superstar transfers, I am convinced that their effects will be dwarfed by the more immediate impact of the superstar's joining the team. This notion is supported by the fact that none of the team-level control variables that were considered for incorporation in the analyses was found to significantly affect the results.

Fourth, my research design did not allow me to collect personality-related data on the individuals in my sample, which are nevertheless likely to influence how teammates respond to superstar entry. For example, promotion-focused individuals are likely to be inspired and motivated by a superstar that constitutes a positive role model for them (Lockwood et al. 2002), whereas prevention-focused individuals will at worst be paralyzed in the face of a superstar threatening their position in the team's established social hierarchy. An experimental set-up, as already indicated above, may thus contribute to our understanding of what personal characteristics have an effect on how individuals react to changes in team composition.

Fifth, the NBA represents a highly specific research setting: all players are male, they are predominantly from the United States, almost three quarters of them have an African American background (Lapchick and Guaio 2015), and presumably all of them are ambitious enough to have worked hard and purposefully in their early careers to be drafted into the world's most prestigious and well-paying basketball league by far. While I am confident that my results hold indifferently from gender, nationality, and race, there is reason to believe that individuals in other organizational contexts will react differently. More specifically, in settings with less performance pressure, public interest, and transparency about any kind of misbehavior, I believe that overt status conflicts may smolder for more extended periods of time. While a professional basketball player is likely to receive immediate and vigorous feedback from

teammates, coaches, fans, and the media when he acts too selfishly on the court, this may not be the case in less high-performing organizational set-ups. Likewise, a reduction of effort over extended periods of time – even mental resignation – appears possible in such organizations. Even though I am convinced that my findings are applicable to other high-performance contexts, such as professional service firms, adopting my research design to less performance-driven organizations, such as not-for-profit institutions, may hence further enhance their external validity.

Finally, the amplitudes of the observed effects are limited and not all of them are significant at the highest levels. What is more, adding the independent variables to the respective base models increases the overall coefficients of determination by only up to four percentage points – and in several cases significantly less than that. However, given that those effects are the result of the players' spontaneous decisions that happen within split seconds in the proverbial 'heat of the moment' and given that, at the performance level of the NBA, small details bear the potential to shape the outcome of games, seasons, and entire championships, I argue that they are nevertheless relevant both to research and for HR practitioners.

2.6.3 Practical Implications

The main implications that my research has for practitioners' hiring and internal staffing decisions are threefold. First and most fundamentally, HR specialists should be aware of the threat of status conflicts and of the two forms – overt and covert – in which they appear. It is likely that overt status conflicts have already been in HR practitioners' spotlights. My analysis indicates, however, that overt status conflicts tend to be short-lived, be it due to implicit mechanisms of feedback from colleagues and other stakeholders, or be it through HR practitioners' and supervisors' measures that contain the conflict quickly when it breaks out. As a consequence, little additional action has to be taken other than attempting to be even faster

in resolving such conflicts so that they elicit fewer behavioral consequences or no consequences at all. This could be done through a thorough and systematic analysis of the expectations of all stakeholders involved and the clear definition and communication of the roles expected from all team members prior to changing how the team is staffed, as well as through the modification of incentive schemes and other systems to reflect these revised role expectations. HR practitioners should, however, sharpen their senses concerning covert status conflicts. The fact that the observed long-term increase in some individuals' cooperation does not result in enhanced performance indicates that at least some of the cooperative behavior may be aimed at increasing one's perceived value to the team through displays of excessive support rather than at the objectives that are relevant to the organization (Anderson and Kilduff 2009a). Unambiguous role descriptions and individual goals paired with short-cycled feedback are required to ensure that all individuals involved work towards the collective goal.

Second, contrary to the common assumption that increasing internal competition will generally make everyone work harder, changes in team composition alone do not appear to bear the potential to enhance effort for extended periods of time. Rather, as the superstar entry scenario shows, it leads to both positive and negative immediate reactions that disappear after as little as two weeks. Organizational complacency can thus not be tackled by triggering competition for status through a superstar newcomer alone, but requires other means, such as changes to leadership behaviors as well as organizational structures and systems.

Finally, when hiring a superstar, HR practitioners should bear in mind that the main benefit of that decision may not be the star's performance itself, as he may struggle to replicate it in the new organizational set-up (Groysberg et al. 2008), but rather his positive and lasting effect on incumbent high-output team members' performance. Accordingly, while providing the best possible work environment for the incoming superstar is a critical task, taking measures to

ensure interactions and knowledge exchange between the newcomer and his new peers may prove even more essential. Rather than only familiarizing the newcomer with ‘the way we do things here’, HR practitioners should thus systematically codify the star’s unique knowledge and capabilities and make them accessible to a broader audience within the new organization.

2.7 Conclusion

The findings of this study suggest that status conflicts come in two distinct forms when a superstar joins a team. Those individuals that are the most similar to the star in terms of status and/or skills act more selfishly in overt status conflicts for a very limited period of time. Individuals with some similarity to the superstar engage in covert status conflicts, displaying higher – if not excessive – cooperative behavior over the long term. Furthermore, effort is only affected by a superstar joining the team for a few weeks following the transfer, and more positively so for high-status individuals and individuals whose skill-sets overlap considerably with that of the superstar. Finally, only the performance of the highest-status individuals on the team increases as a result of an incoming superstar, and does so for extended periods of time.

3. Paper II – Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams¹³

3.1 Introduction

Pay variation¹⁴, which can be defined as “the extent to which pay varies within a collective” (Gupta et al. 2012: p. 100), has been subject to extensive scientific research, given its relevance for multiple outcomes on the individual, team, and organizational levels. These include: individual performance (Becker and Huselid 1992, Bloom 1999, DeVaro 2006, Frey et al. 2013, Shaw et al. 2002); job satisfaction (Pfeffer and Langton 1993); turnover (Bloom and Michel 2002, Pfeffer and Davis-Blake 1992, Messersmith et al. 2011, Shaw and Gupta 2007); team performance (Bloom 1999, Trevor et al. 2012); product quality (Cowherd and Levine 1992); workforce productivity (Kepes et al. 2009); organizational performance (Brown et al. 2003, Fredrickson et al. 2010, Grund and Westergaard-Nielsen 2008, Henderson and Fredrickson 2001, Siegel and Hambrick 2005); innovation (Yanadori and Cui 2013); and growth (Ding et al. 2009).

Despite a comprehensive body of research, there is still little agreement on whether pay variation is positively or negatively related to individual performance in particular (Gupta et al. 2012, Downes and Choi 2014). While some researchers emphasize the positive motivational impact of incentivizing and rewarding higher-than-average performance financially (Becker

¹³Eberhard, K. 2016b. Horizontal Pay Variation Revisited: The Role of Status in Interdependent Teams. Unpublished Working Paper.

¹⁴In accordance with Gupta et al. (2012), I use the more comprehensive term ‘pay variation’ rather than the less comprehensive, but more frequently used term ‘pay dispersion’, which may be confounded with a specific measurement approach to pay variation (cf. chapter 3.4.3 Independent Variables).

and Huselid 1992, Kepes et al. 2009, Trevor et al. 2012, Ding et al. 2009), others argue that pay differentials may be perceived as unfair and thus undermine collaboration in teams, as individuals try to “outshine” (Lazear and Shaw 2007: p. 101) their peers (Bloom 1999, Brown et al. 2003, Fredrickson et al. 2010, Siegel and Hambrick 2005).

I trace this continuing disagreement back to three factors. First, the relationship between pay variation and organizational outcomes is inherently complex (Kepes et al. 2009, Shaw et al. 2002). It may be contingent on a plethora of moderating factors, such as team coordination needs (Henderson and Fredrickson 2001), work interdependence (Trevor et al. 2012) and the public accessibility of salary information (Pfeffer and Davis-Blake 1992, Shaw and Gupta 2007). What is more, subjective perceptions may not accurately reflect actual pay variation (Downes and Choi 2014). Consequently, there is likely to be a non-linear relationship between pay variation and performance outcomes: there may be a tipping point in the extent of pay variation that individuals still perceive as motivating and fair. In spite of calls for an empirical emphasis on non-linear effects (Downes and Choi 2014, Trevor et al. 2012), this potential has yet to be fully exploited.

Second, most of the research on the topic has been cross-sectional rather than longitudinal and thus unable to unequivocally establish causal relationships between pay variation and performance outcomes (Downes and Choi 2014, Cowherd and Levine 1992).

Finally, the majority of studies have argued that the main lever through which pay variation affects individual performance is its intermediate influence on cooperation as a central sub-dimension of performance (Bloom 1999, Bloom and Michel 2002, Brown et al. 2003, Fredrickson et al. 2010, Kepes et al. 2009, Siegel and Hambrick 2005). However, hardly any of them have actually measured cooperation directly. In fact, the only study I am aware of was conducted by Pfeffer and Langton (1993), who relied on self-reported survey data to establish

a link between pay variation and collaborative research in academic departments. Accordingly, Fredrickson et al. (2010) propose that “the intervening processes are yet to be documented, measured, and modeled” (p. 1049). Likewise, Siegel and Hambrick (2005), who analyze how pay variation in top management groups affects the corporate performance of high-technology firms, state: “We do not have behavioral data to measure executive interactions, nor do we have the measures to assess our explanation for these underlying processes. Hence, there is an important need for field research that directly examines the effects of pay allocations on executive group dynamics” (p. 271).

In this paper, I review the propositions developed by other studies on the relationship between horizontal pay variation, i.e. “the degree that pay varies for employees within a given job or hierarchical level” (Downes and Choi 2014: p. 57), and individual-level cooperation as well as performance. These propositions are based on the three predominant theories in the ongoing discussion: equity theory, expectancy theory, and tournament theory. I then contrast these propositions with my own hypotheses based on status theory, which has, to my knowledge, not yet been considered in the analysis of pay variation. I then empirically test both sets of hypotheses using a large sample that covers 30 years of professional basketball in the NBA. The NBA provides transparent data on income, cooperation, and performance in highly interdependent team settings and thus serves as an opportune ‘laboratory’ to draw inferences for a variety of team situations. I exclusively focus on horizontal pay variation and leave aside vertical pay variation, defined as the degree by which pay varies for employees between hierarchical levels, as the former has been theorized to evoke stronger reactions from employees than the latter (Shaw et al. 2002, Gupta et al. 2012) and thus to bear higher relevance for organizational outcomes.

In doing so, I hope to contribute to the current state of research in three ways: first, I complement the understanding of the pay variation phenomenon by providing evidence of the role of status theory and pay as a powerful signal of status, which may help explain some of the contradictory findings in earlier studies. Second, I comply with calls for longitudinal research by including changes in pay variation rather than just pay variation itself as the independent variable in my analysis with particular attention to potential curvilinear effects. Finally, through my unique sample I am able to measure cooperation directly, thus shedding light into the hitherto obscure processes through which pay variation ultimately affects performance.

This study will be structured as follows: in the next section, I will review theories of equity and expectancy as the dominant behavioral theories used to explain the effects of pay variation as well as tournament theory as the dominant economic theory and contrast them with the propositions of status theory. Subsequently, hypotheses will be developed based on these theories and tested empirically. Finally, I will discuss the implications of my findings for theory and practice.

3.2 Theoretical Background

As Brown et al. (2003) conclude, "no single theory can fully explain how compensation relates to organizational performance" (p. 759-760). In this section, I thus first provide an overview of the three well-established, dominantly used theories in pay variation research, namely equity theory and expectancy theory as behavioral and perceptual theories as well as tournament theory as the most relevant economic theory. Subsequently, status theory and the role of pay as an indicator of organizational status will be discussed.

3.2.1 Established Theoretical Perspectives

Equity theory. As its integral element, equity theory (Adams 1963) – the most widely applied and tested theory in pay variation research (Downes and Choi 2014) – posits that individuals continually make social comparisons between the ratio of the inputs they provide and the outcomes they receive on the one hand and the ratio of inputs provided and outcomes received by members of a relevant reference group of individuals that they are similar to or frequently interact with (Frank 1984, Gupta et al. 2012) on the other hand. These social comparisons may result in feelings of unfairness and trigger according behavioral responses (Gupta et al. 2012). Specifically, individuals that perceive being treated unfairly will try to align their input-outcome ratios with those of the reference group members by (a) reducing inputs (i.e. effort), by attempting to (b) secure a larger share of outcomes, (c) to extract higher levels of input by others, or (d) to undermine others' outcomes, by (e) changing the reference group, or, ultimately, by (f) ending inequitable relationships (Adams 1963, Cowherd and Levine 1992).

It is important to note that perceptions of equity may deviate considerably from actual equity (Grund and Westergaard-Nielsen 2008, Kepes et al. 2009). Inputs in particular “are subject to strong self-enhancing perceptual biases that cause people to give themselves more credit than is deserved, and others less” (Cowherd and Levine 1992: p. 307), especially in situations with multiple input dimensions to which individuals may assign different values (Cook and Yamagishi 1983). That is, “individuals routinely overestimate their abilities and contributions relative to those of others” (Fredrickson et al. 2010: p. 1034). What is more, relative deprivation theory as an alternative notion to equity theory suggests that individuals may only compare outcomes regardless of input differentials. Therefore, any – or at least any large – pay difference, even if driven by real productivity differences, may be perceived as unfair

(Henderson and Fredrickson 2001). As a consequence, perceived inequity is likely to be ubiquitous, even in settings with objective pay equity.

Nevertheless, pay equity must not be confounded with pay equality. If individuals' inputs vary, and if this variation in inputs is transparent to these individuals, some degree of pay variation to reflect this variation in inputs is necessary to comply with fairness expectations, particularly of those individuals providing above-average inputs (Brown et al. 2003, Pfeffer and Davis-Blake 1992). However, beyond a certain tipping point, even pay differentials explained by input differentials will be perceived as too large and, thus, violate equity perceptions (Trevor et al. 2012, Shaw et al. 2002, Torgler and Schmidt 2007). As a result, equity theory postulates that pay should vary with inputs, but not as much as standard economic theory would predict based on individuals' marginal products, which has found empirical support (Frank 1984).

Expectancy theory. As the foundation of expectancy theory, the second dominant perceptual theory used to examine the effects of pay variation, Vroom (1964) suggests that three conditions must be in place for individuals to be motivated by pay differences: first, individuals must value the outcome in prospect, i.e. high levels of pay (*valence*); second, they must believe that higher levels of effort will result in higher levels of performance (*expectancy*); finally, they must perceive that higher levels of performance will in turn increase the value of the outcome they obtain (*instrumentality*).

In general, high levels of pay variation should affect performance positively, as they are associated with high valence – a valuable outcome in prospect for high levels of effort. If, however, the second or third of the three – likely additive (van Eerde and Thierry 1996) – elements are lacking, i.e., if higher effort does not lead to higher performance or if higher performance is not rewarded accordingly, individuals can be expected to act in a manner

consistent with their expectations (Bell et al. 2006) and, thus, to limit their effort as well as their support for other team members, resulting in lower individual performance.

Tournament theory. Tournament theory (Lazear and Rosen 1981), which is sometimes subsumed under the term efficiency wage theory (Brown et al. 2003, Ding et al. 2009), has been the third major theoretical approach to analyzing aspects of pay variation (Downes and Choi 2014, Gupta et al. 2012). As opposed to the two previous behavioral theories that fit Grund's and Westergaard-Nielsen's (2008) overarching term "fairness approaches" (p. 488) and focus on individual perceptions and behaviors, tournament theory represents a purely economic approach. It posits that, in situations where absolute performance is difficult to assess, rewards are distributed among individuals – typically executives in a corporate setting – in a rank-order tournament based on relative performance. The larger the pay gaps between hierarchical levels are, the higher the motivational effect for the individual should be, the theory argues (Becker and Huselid 1992, Conyon et al. 2001). Thus, the pay gap between the CEO of an organization and the other members of the executive board may well exceed the gap justified by productivity differentials in order to incentivize the board members to compete for the CEO position by means of performance levels that positively stand out from those of their peers (Lazear and Rosen 1981, Henderson and Fredrickson 2001). Those who lose the competition, however, are expected to leave, resulting in a steady renewal of managerial talent at the top of the organization (Bloom and Michel 2002).

Even though tournament theory has been widely used in pay variation research, I will focus on the fairness approaches presented before for two reasons. First, even though tournament theory has been applied to all types of pay variation, its primary focus is vertical pay variation between hierarchical levels within an organization (Downes and Choi 2014, Gupta et al. 2012). Given my focus on horizontal pay variation, I decide to exclude tournament theory from my analysis.

Second, I believe that for the initial comparison of the predictions of established theories on the one hand and those of status theory on the other hand, it is worthwhile to stay within the realm of behaviorist theories to avoid exuberant complexity. An introduction to the implications of status theory for pay variation research will be provided subsequently.

3.2.2 Status Theory and Pay Variation

Pay has been shown to be not only an end in itself, but also to affect an individual's status position within the organization (Bloom 1999, Brown et al. 2003, Frank 1984). In fact, some authors argue that the status implications of high monetary rewards may be even more important than these rewards themselves (Fredrickson et al. 2010, Main et al. 1993). Status can be defined as a “signal [of] the particular category that an individual [...] occupies within a well-defined social hierarchy” (Piazza and Castellucci 2014: p. 287), i.e. in an “implicit or explicit rank order of individuals or groups with respect to a valued social dimension” (Magee and Galinsky 2008: p. 354). As pay may serve as a means of signaling an individual's value for the organization (Bloom 1999, Brown et al. 2003) as well as desired and appropriate behaviors (DeVaro 2006), there is likely to be a very strong relationship between individuals' relative pay and status positions within a team.

Status hierarchies inevitably emerge and develop in any collective working on a joint task either through formal assignment of roles or through informal power struggles and strategic maneuvering (Bendersky and Hays 2012). Once these hierarchies become stable, they provide the collective with multiple benefits: they facilitate the assignment of responsibilities and resources and, thus, augment group effectiveness (Overbeck et al. 2005); they enhance the quality of communication and simplify decision-making (Groysberg et al. 2011); and they support a common understanding of what is expected from each individual team member (Halevy et al. 2012). Given the pivotal role that pay plays in defining status, higher levels of

pay variation may facilitate and accelerate the formation of a stable status hierarchy within a collective and, thus, contribute to group collaboration and effectiveness.

Taking everything into consideration, the established behavioral theories primarily stress the potentially negative effects of excessive levels of pay variation that individuals do not perceive as justified on collaboration, whereas status theory provides insights into how high levels of pay variation may simplify the formation of a status hierarchy and, thus, positively contribute to collective task attainment. The subsequent section will develop hypotheses based on both fairness approaches and status theory to be tested empirically.

3.3 Hypotheses

Based on equity and expectancy considerations alone, I would expect an inverted U-shaped relationship between horizontal pay variation and both cooperation and performance.

Equity theory, on the one hand, posits that individuals use social comparisons to assess the fairness of their input/outcome ratios relative to relevant others. While a certain degree of horizontal pay variation is needed to account for visible and intelligible differences in effort and human capital, such as education, experience, and skills (Brown et al. 2003), larger extents of horizontal pay variation will go beyond what is justified by productivity differentials – or at least beyond what is perceived as justified due to self-enhancing tendencies – given similar or even identical job descriptions and requirements (Trevor et al. 2012). While horizontal pay variation up to that tipping point will be considered fair and, thus, motivating, anything beyond that point will be perceived as unfair, resulting in frustration, reduced effort, and dysfunctional or even sabotaging behaviors targeted at those with more favorable input/outcome ratios. As a result, equity theory predicts performance and cooperation to increase with horizontal pay

variation at low levels, but to decrease with horizontal pay variation at high levels, particularly in settings in which tasks are performed interdependently by teams (Shaw et al. 2002).

Expectancy theory, on the other hand, argues that some degree of pay variation may positively affect performance by providing a financial incentive for higher-than-average performance (Becker and Huselid 1992, Shaw et al. 2002). However, when the link between performance and outcome is unclear, e.g. because political behaviors undermine instrumentality (Kepes et al. 2009), or if success is improbable given the natural limits to one's personal performance potential (Becker and Huselid 1992, Bell et al. 2006), the opposite effect is likely: particularly those individuals at the lower end of the pay hierarchy will envy their peers (Frey et al. 2013), develop increasingly antagonistic relationships within their teams (Bloom and Michel 2002), and gradually disengage from the task (Bell et al. 2006). In consequence, there will be a limit to the extent of horizontal pay variation that has a positive effect on individual performance and cooperation, resulting in an inverted U-shaped relationship.

This hypothesized non-linear relationship may explain why empirical studies have found contradictory results on the effect of pay variation on performance and, explicitly or implicitly, on cooperation. As one of the first studies in the field, Becker and Huselid (1992) found a positive relationship between prize money spread and both performance and risk-taking among NASCAR drivers. The authors argue that the performance-enhancing effect of the spread has an upper limit, while risk-taking only increased at very high levels of spread. It can be expected that this tendency to behave recklessly in the face of highly differentiated individual outcomes would have detrimental effects on performance and, in particular, on cooperation in more interdependent team settings.

Kepes et al. (2009) in their analysis of truck drivers' individual performance as well as Trevor et al. (2012) in their analysis of National Hockey League (NHL) teams' collective performance

support the notion of a positive effect of horizontal pay variation. More specifically, they find that performance-based and explained pay variation, respectively, positively contribute to performance. By contrast, political and unexplained pay variation, respectively, are identified to have a negative effect on organizational outcomes. Trevor et al. (2012) even find that the positive effect of explained variation diminishes and eventually turns negative at high levels of pay variation, thus providing evidence for the notion that even pay variation that is objectively justified by individual differences in productivity may be perceived as unfair in support of a hypothesized inverted U-shaped relationship between horizontal pay variation and performance as well as cooperation.

While the studies described above support the notion of potential positive implications of horizontal pay variation, the majority of studies have found evidence for the contrary. Pfeffer and Langton (1993) were among the first to find a negative impact of pay variation on job satisfaction, collaboration, and research productivity among academic faculty. Bloom (1999) was one of few scholars to investigate and find a negative effect on individual-level performance, arguing that high levels of pay variation provided disincentives for cooperation in Major League Baseball (MLB), while other researchers primarily focused on the negative effects on other organizational outcomes on the individual level, such as managerial tenure (Bloom and Michel 2002, Messersmith et al. 2011, Pfeffer and Davis-Blake 1992), or on performance on the organizational level (Ding et al. 2009, Fredrickson et al. 2010, Grund and Westergaard-Nielsen 2008, Henderson and Fredrickson 2001).

Based on these findings, I hypothesize that there is an incentivizing effect of horizontal pay variation in interdependent team settings, which, however, wanes at limited extents of pay variation and gives way to perceptions of unfairness that result in frustration, reduced effort, withdrawal of support for teammates, and, ultimately, lower performance.

HYPOTHESIS 1_A (H1_A). *In an interdependent team setting, there will be an inverted U-shaped relationship between horizontal pay variation and individual cooperation.*

HYPOTHESIS 2_A (H2_A). *In an interdependent team setting, there will be an inverted U-shaped relationship between horizontal pay variation and individual performance.*

Based on considerations of status theory, however, I expect that very high levels of horizontal pay variation may have a positive effect on cooperation and, ultimately, performance. Differences in pay between members of a collective as a presumed indicator of task competence (Bunderson and Reagans 2011) are likely to directly translate into status differences (Fredrickson et al. 2010, Main et al. 1993). These status differences, in turn, facilitate the emergence of an unambiguous, stable, and self-reinforcing status hierarchy within the collective (Kilduff and Galinsky 2013) and help avoid status conflicts, i.e. “disputes over people’s relative status positions in their group’s social hierarchy” (Bendersky and Hays 2012: p. 323), that may potentially undermine collaboration in and commitment to the collective (Groysberg et al. 2011). In addition, while high-status individuals will benefit from decision rights, freedom to act, and access to resources (Bothner et al. 2007), low-status individuals will tend to adapt to the actions and goals of their higher-ranking peers (Bunderson and Reagans 2011), both of which are expected to enhance collaboration. Furthermore, at very large extents of pay variation in particular, the success potential of actions geared to gaining status is low, which makes such unproductive activities less attractive and should, thus, result in all members of the collective focusing their energies on the collective task at hand rather than on enhancing their own status positions (Bendersky and Shah 2012).

Taking all aspects into consideration, I expect the threat of status conflicts to increase with horizontal pay variation at low and medium levels of variation, while high levels of horizontal pay variation will contribute to clarifying status positions and thus enhance collaboration, resulting in a U-shaped overall relationship between horizontal pay variation and cooperation as well as performance.

HYPOTHESIS 1_B (H1_B). *In an interdependent team setting, there will be a U-shaped relationship between horizontal pay variation and individual cooperation.*

HYPOTHESIS 2_B (H2_B). *In an interdependent team setting, there will be a U-shaped relationship between horizontal pay variation and individual performance.*

In addition to my analysis of absolute levels of horizontal pay variation, I will also examine *changes* in horizontal pay variation to overcome some of the issues associated with establishing causal relationships in pay variation research (Cowherd and Levine 1992, Downes and Choi 2014).

From the perspectives of equity and expectancy theories, an increase in pay variation is likely to have a negative effect on cooperation and performance. An increase in horizontal pay variation must logically be the result of either (a) a relative increase of pay for individuals at the top of the pay hierarchy compared to those lower in the pay hierarchy or (b) a structural change in the composition of the group through which members from the middle of the pay hierarchy are effectively substituted with individuals at either end of the pay hierarchy.

In the former scenario, approaching the tipping point beyond which any pay variation is no longer perceived as justified (Shaw et al. 2002) and the self-enhancement tendencies of those

toward the lower end of the pay hierarchy (Fredrickson et al. 2010) will lead them to perceive their disproportionately lower pay increases as unfair. As a result, they may antagonize, rather than cooperate with, those who have received larger raises despite their already higher incomes, provoking the corresponding responses from those higher up in the pay hierarchy. Accordingly, as one of the very few studies that analyzed pay variation dynamically, Grund and Westergaard-Nielsen (2008) found a U-shaped relationship between the variation of pay *increases* and firm-level performance, in which, however, 98% of the firms analyzed were found in the downward-sloping part of the curve, thus representing a de facto negative relationship.

In the latter scenario, the newcomers toward the upper end of the pay hierarchy will first have to strengthen their status positions within the new environment, which is unlikely to go unchallenged by incumbent members and, thus, may bring about status conflicts that disrupt cooperation and performance. As a consequence, equity and expectancy theories jointly suggest a negative relationship between increases in horizontal pay variation and individual cooperation and performance.

HYPOTHESIS 3_A (H3_A). *In an interdependent team setting, an increase in horizontal pay variation will have a negative effect on individual cooperation.*

HYPOTHESIS 4_A (H4_A). *In an interdependent team setting, an increase in horizontal pay variation will have a negative effect on individual performance.*

By contrast, considerations of status theory suggest a positive relationship between changes in horizontal pay variation and cooperation as well as performance. Disproportionately higher pay increases at the top of the pay hierarchy can be expected to reinforce the existing status hierarchy that goes along with it, as it provides an unambiguous signal to all members as to which contributions the organization values most (Kilduff and Galinsky 2013, DeVaro 2006,

Brown et al. 2003). As a result, increasing pay variation will add clarity to roles, responsibilities, and social interactions, mitigate the threat of status conflicts, and reduce the group members' focus on non-productive, but status-enhancing activities (Overbeck et al. 2005, Groysberg et al. 2011, Bothner et al. 2012). Even if increases in horizontal pay variation caused by addition or replacement of individual team members may destabilize the group's status hierarchy temporarily and stir up status conflicts (Bendersky and Hays 2012), I expect that these conflicts will be short-lived and, thus, outweighed by the positive reinforcement of the status hierarchy through higher levels of horizontal pay variation.

HYPOTHESIS 3_B (H3_B). *In an interdependent team setting, an increase in horizontal pay variation will have a positive effect on individual cooperation.*

HYPOTHESIS 4_B (H4_B). *In an interdependent team setting, an increase in horizontal pay variation will have a positive effect on individual performance.*

Taking everything into consideration, the theoretical arguments provided by equity and expectancy theories on the one hand and by status theory on the other hand result in contradictory predictions concerning the effects of horizontal pay variation on individual cooperation and performance. While equity and expectancy theories suggest a tipping point in pay variation, beyond which the motivational aspect of income differentials disappears and is outweighed by perceptions of unfairness and frustration, status theory suggests that significant levels of horizontal pay variation facilitate the emergence of a clear and stable status hierarchy. Likewise, increases in horizontal pay variation are associated with a decrease in cooperation and performance according to equity and expectancy theories, while a positive effect is hypothesized based on status considerations.

3.4 Methods

3.4.1 Research Setting and Sample

In order to test my hypotheses, I analyze horizontal pay variation, cooperation, and performance in the NBA over a thirty-year time period. Sports settings, which have been frequently used to assess aspects of pay variation (Becker and Huselid 1992, Berri and Jewell 2004, Bloom 1999, Schmidt et al. 2009, Trevor et al. 2012), provide a number of unique advantages over corporate settings (Frey et al. 2013, Berman et al. 2002): First, observable and accurate measures of performance and cooperation exist not only on the team and season levels, but on the player and game levels. As a result, the database features more breadth, depth, and accuracy than, for instance, self-reported survey data of executive behaviors. Second, salary information is not only publicly available, further enhancing the accuracy of the analysis, but also widely discussed in the media, thus sharpening the senses of the involved individuals for the topic. Finally, much like in a field experiment, sports provide controlled settings in which all teams and team members have to abide by the same rules and pursue the same collective objectives, dampening some of the noise associated with performance assessments in interdependent team settings. Despite the specificities of the sports setting, I am convinced that the implications of my research are relevant for wide range of team situations in businesses and other organizations, given the archetypical interplay between cooperation to achieve collectively meaningful objectives and competition for individual rewards, such as promotions, raises, and other forms of special recognition (Deutsch 1949, Berman et al. 2002).

Basketball, in particular, possesses some unique features that are valuable for my research objectives. First, interdependence between players is higher than in most other team sports, making cooperation particularly important for collective success: “cooperation, teamwork, in

basketball is voluntary and discretionary. Players repeatedly face situations in which they can elect whether or not to cooperate” (Keidel 1987: p. 593). As such, basketball can be considered the sport that is most comparable to the apportionment of work in modern business organizations, which increasingly emphasize creatively working in teams (Lazear and Shaw 2007). Second, given the limited team and field sizes in basketball, all players are continually active in either offense or defense and, hence, almost seamlessly tracked in their performance-relevant behaviors.

Data were collected on all NBA players between the 1985/86 and 2014/15 seasons, including regular seasons and playoffs, from <http://www.basketball-reference.com/>. This timeframe represents all seasons in which salary cap regulations have been in place and, thus, salary information for each player is available. Excluding incomplete observations, a total of 646,956 player-game combinations have been incorporated.

3.4.2 Dependent Variables

Individual cooperation – the proposed mechanism through which horizontal pay variation affects performance according to most researchers – as well as individual performance itself will serve as dependent variables in my analysis.

Cooperation. I use *assists per game* as a measure of individual cooperation. Assists have so far been applied as the primary measure of cooperation in studies using professional basketball as their settings (Berman et al. 2002, Halevy et al. 2012). An assist can be defined as “a pass that directly leads to a basket” (NBA 2002), which provides statisticians with some degrees of freedom in assessing whether or not a pass and a scoring throw are immediately linked. Assists represent the level of cooperation both on the team and individual levels: On the team level, it shows how well individual players’ actions are harmonized by giving an indication of whether

Methods

baskets are scored through well-choreographed team plays or single-handed actions by individual players. Even more importantly, on the individual level, assists entail the spur-of-the-moment decision to forgo one’s own scoring opportunity, and, thus, an opportunity to outshine one’s teammates, in favor of a potentially better chance to score – and, ultimately, to win the game – for the entire team. As a result, assists allow me to accurately assess intra-team dynamics and individual cooperation decisions on the field.

To account for the fact that playing time per game varies between players, I extrapolate the number of assists to full games of 48 minutes of regular time each. I do so by multiplying the number of assists per game with 48 divided by the minutes actually played to calculate my cooperation measure *assists per game*. On average, players contribute a little more than four assists per game (cf. Table 18) or one assist every 11 minutes and 40 seconds.

Table 18: Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|-----|-------------|---------------------------------|---------|--------|--------|--------|--------|
| 1 | Dependent | <i>Assists per game</i> | 646,956 | 4.076 | 4.854 | 0 | 960 |
| 2 | Dependent | <i>Efficiency per game</i> | 646,956 | 20.158 | 21.061 | -2,880 | 5,760 |
| 3 | Control | <i>Relative pay</i> | 646,956 | 1.145 | 1.012 | 0.003 | 8.105 |
| 4 | Control | <i>Position: center</i> | 646,956 | 0.329 | 0.470 | 0 | 1 |
| 5 | Control | <i>Position: power forward</i> | 646,956 | 0.357 | 0.479 | 0 | 1 |
| 6 | Control | <i>Position: small forward</i> | 646,956 | 0.339 | 0.474 | 0 | 1 |
| 7 | Control | <i>Position: shooting guard</i> | 646,956 | 0.343 | 0.475 | 0 | 1 |
| 8 | Control | <i>Position: point guard</i> | 646,956 | 0.255 | 0.436 | 0 | 1 |
| 9 | Control | <i>Team tenure</i> | 646,956 | 120 | 176 | 1 | 1,489 |
| 10 | Control | <i>Age (days)</i> | 646,956 | 9,969 | 1,495 | 6,581 | 15,769 |
| 11 | Independent | <i>Pay range</i> | 646,956 | 10.034 | 6.449 | 0.426 | 32.868 |
| 12 | Independent | <i>Pay cap</i> | 646,956 | 10.300 | 6.523 | 0.600 | 33.140 |
| 13 | Independent | <i>Pay dispersion</i> | 646,956 | 0.977 | 0.244 | 0.411 | 2.001 |
| 14 | Independent | <i>Delta pay range</i> | 504,198 | 1.195 | 0.623 | 0.099 | 8.177 |

Performance. I use *efficiency per game*, i.e. each player’s efficiency score extrapolated to 48 minutes of regular playing time, in order to measure individual performance. Efficiency is the most commonly used indicator of overall on-the-field performance due to its simplicity and

comprehensiveness. Simply put, efficiency is the unweighted sum of actions that positively affect the game outcome for the player's team – points scored, assists, offensive and defensive rebounds, steals, and blocks – from which the equally unweighted sum of actions that negatively affect the game outcome – field goals missed, free-throws missed, and turnovers – is subtracted. Other actions that are documented statistically are not included, as they cannot unequivocally be attributed to either side. For example, fouls may be considered negative, because they cause additional scoring opportunities for the opposing team. However, they are frequently exploited as a tactical instrument by losing teams to stop the clock, force the least proficient shooter of the other team to take the free-throws that ensue, and regain possession quickly, which may enhance the winning chances for the own team. As the number of positive actions usually exceeds that of negative ones, I multiply efficiency with 48 minutes of regular playing time divided by actual minutes played to account for playing time variations among players.

$$\text{Efficiency per game} = 48 * ((\text{Points} + \text{Assists} + \text{Rebounds} + \text{Steals} + \text{Blocks}) - (\text{Field goals missed} + \text{Free-throws missed} + \text{Turnovers})) / \text{Minutes played}$$

3.4.3 Independent Variables

Horizontal pay variation. Two primary categories of pay variation measures have been used in empirical research (Gupta et al. 2012): *pay range*, which can be defined as “the difference between the highest and lowest pay level for individuals in a job” (p. 111), on the one hand, and measures of pay dispersion on the other hand, which also take the income distribution in between the upper and lower limits into account, most notably the coefficient of variation (Bloom 1999, Ding et al. 2009, Fredrickson et al. 2010, Pfeffer and Davis-Blake 1992, Pfeffer and Langton 1993) and the Gini coefficient (Bloom and Michel 2002, Bloom 1999, Brown et al. 2003, Messersmith et al. 2011). Even though measures of dispersion appear to be more

Methods

frequently used in pay variation research, I focus on *pay range* in USD Mn as my primary measure of horizontal pay variation. In so doing, I follow Kepes et al. (2009) and Gupta et al. (2012), who argue that individuals are neither willing nor able to process the entire team payroll to assess pay dispersion. Rather, they will be aware of their own pay and the pay of the highest-earning individual, as social comparisons tend to focus on those higher up in the pay hierarchy (Bloom 1999, Frey et al. 2013), making *pay range* much more relevant to individual team members' perceptions than pay dispersion.

Kepes et al. (2009) even suggest taking this simplification one step further by only including *pay cap*, i.e. the pay of the highest-earning individual, and excluding the pay floor. As upward comparisons are more relevant than downward comparisons and lower pay limits are typically set by regulatory and market conditions – in my research setting, the NBA Collective Bargaining Agreement (CBA) clearly defines the salary and permissible raises for each newly drafted player based on draft position – both measures are hypothesized to lead to similar, if not identical results (Gupta et al. 2012). The extremely high correlation of 0.999 between *pay range* and *pay cap* (cf. Table 19) supports this perspective. Even though using both *pay range* and *pay cap* will hardly increase the robustness of my results given the near equivalence of both measures, I will do so to further establish the adequacy of *pay cap* as a simple, yet accurate measure of horizontal pay variation. In addition, I will also include the coefficient of variation, i.e. the standard deviation divided by the sample mean, as *pay dispersion* to validate the relative value of range and dispersion measures.

Changes in horizontal pay variation. I use *delta pay range*, which I define as the *pay range* in a player's team in the current season divided by the *pay range* in the player's team in the previous season, to measure changes in horizontal pay variation dynamically. Given my focus on the individual player level, it is important to note that changes in pay variation always refer

Methods

to the individual rather than to the team. This implies that players that transfer from one club to another may experience significant changes in *pay range* that are captured by *delta pay range*, even though horizontal pay variation at either of the two clubs does not change.

Table 19: Variable Correlations

| No. | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|-----|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|
| 1 | <i>Assists p. g.</i> | 1.000 | | | | | | | | | | | | | |
| 2 | <i>Effic. p. g.</i> | 0.177 | 1.000 | | | | | | | | | | | | |
| 3 | <i>Relative pay</i> | 0.084 | 0.139 | 1.000 | | | | | | | | | | | |
| 4 | <i>Pos.: C</i> | -0.280 | 0.074 | 0.142 | 1.000 | | | | | | | | | | |
| 5 | <i>Pos.: PF</i> | -0.245 | 0.058 | 0.096 | 0.410 | 1.000 | | | | | | | | | |
| 6 | <i>Pos.: SF</i> | -0.111 | -0.040 | -0.003 | -0.345 | 0.045 | 1.000 | | | | | | | | |
| 7 | <i>Pos.: SG</i> | 0.121 | -0.068 | -0.080 | -0.511 | -0.473 | 0.169 | 1.000 | | | | | | | |
| 8 | <i>Pos.: PG</i> | 0.444 | -0.032 | -0.094 | -0.415 | -0.447 | -0.360 | 0.224 | 1.000 | | | | | | |
| 9 | <i>Team tenure</i> | 0.092 | 0.100 | 0.416 | 0.029 | -0.012 | -0.057 | -0.047 | -0.017 | 1.000 | | | | | |
| 10 | <i>Age (days)</i> | 0.016 | -0.027 | 0.194 | 0.065 | 0.008 | -0.016 | 0.008 | 0.005 | 0.180 | 1.000 | | | | |
| 11 | <i>Pay range</i> | -0.034 | -0.012 | 0.023 | -0.045 | 0.024 | 0.030 | 0.063 | 0.006 | 0.029 | 0.047 | 1.000 | | | |
| 12 | <i>Pay cap</i> | -0.035 | -0.012 | 0.020 | -0.045 | 0.025 | 0.029 | 0.063 | -0.006 | 0.028 | 0.044 | 0.999 | 1.000 | | |
| 13 | <i>Pay dispers.</i> | -0.018 | -0.005 | 0.074 | -0.018 | 0.009 | 0.022 | 0.026 | -0.001 | 0.021 | 0.085 | 0.705 | 0.692 | 1.000 | |
| 14 | <i>Δ pay range</i> | 0.001 | -0.003 | -0.055 | 0.003 | -0.009 | 0.007 | -0.017 | 0.004 | -0.020 | 0.042 | 0.178 | 0.174 | 0.343 | 1.000 |

Note: Correlations in bold are significant at $p < 0.05$.

3.4.4 Control Variables and Model Specification

I control for each individual's relative pay position within the team, position on the field, age, and tenure with his current team in my analysis.

Relative pay. Each player's pay in any given year is divided by the team's average pay in that year to calculate *relative pay*. Individuals toward the top of the pay hierarchy have consistently been shown to be more favorably inclined to high levels of pay variation, as they benefit from them, whereas those lower in the pay hierarchy perceive them as even less fair (Bloom 1999, Trevor and Wazeter 2006).

Methods

Player position. A binary control variable is included for each of the five positions on the field, of which each player can take between one and three due to the specificities of each of the roles. Given that guards tend to generally contribute more assists, while forwards benefit from generally higher pay levels (cf. Table 19), positions are controlled for to avoid distortions in the empirical analysis.

Age. Like in any other profession, basketball players start their careers with relatively low pay levels that continually increase as their talent unfolds and as they gain experience. Knowing that their times are yet to come, young players may perceive higher levels of pay variation as less unfair compared to older players who may have already hit their performance – and hence pay – ceilings. Thus, I control for player *age* in days at the beginning of each regular season.

Team tenure. The number of matches a player has played for a specific club are counted by the control variable *team tenure*. Tenure with a specific team can enhance a player's knowledgeability of the pay structure, his teammates, and their individual contributions to collective success. Thus they may affect perceptions of equity and status.

I employ OLS regression to test my hypotheses, the results of which are described in the following section.

3.5 Results

Table 19 summarizes the variable correlations in my analysis. Two aspects are noteworthy: first, correlations between variables other than between the alternative independent variables measuring pay variation and between field positions are consistently below 0.5. Particularly, the correlation between *assists per game* and *efficiency per game* is below 0.2, clearly establishing the differentness of cooperation and performance as empirical constructs that have frequently been blended, or have at least been interpreted as closely related, in pay variation

Results

research. Second, almost all correlations are statistically significant ($p < 0.05$), which is mainly the result of the extraordinarily large sample size. As a consequence, all effects observed should be interpreted with caution and particular attention to their amplitudes and explanatory power.

Table 20: Results of Regression Analyses Testing Effects of Pay Variation on Assists per Game

| Variable | Base Model: Controls only | Model 1a: Pay range (lin.) | Model 1b: Pay range (squ.) | Model 2: Pay cap (squ.) | Model 3: Pay disp. (squ.) |
|---------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|--------------------------------------|
| <i>Pay range</i> | | - 0.045 *** | - 0.127 *** | | |
| <i>Pay range</i> ² | | | 0.004 *** | | |
| <i>Pay cap</i> | | | | - 0.127 *** | |
| <i>Pay cap</i> ² | | | | 0.004 *** | |
| <i>Pay dispersion</i> | | | | | - 2.521 *** |
| <i>Pay dispersion</i> ² | | | | | 0.856 *** |
| <i>Relative pay</i> | 0.527 *** | 0.523 *** | 0.531 *** | 0.531 *** | 0.534 *** |
| <i>Pos.: C</i> | - 1.460 *** | - 1.481 *** | - 1.472 *** | - 1.472 *** | - 1.474 *** |
| <i>Pos.: PF</i> | - 0.427 *** | - 0.374 *** | - 0.351 *** | - 0.350 *** | - 0.408 *** |
| <i>Pos.: SF</i> | - 0.156 *** | - 0.147 *** | - 0.134 *** | - 0.134 *** | - 0.157 *** |
| <i>Pos.: SG</i> | - 0.380 *** | - 0.327 *** | - 0.302 *** | - 0.301 *** | - 0.362 *** |
| <i>Pos.: PG</i> | 3.970 *** | 3.985 *** | 4.003 *** | 4.003 *** | 3.974 *** |
| <i>Team tenure</i> | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 3.424 *** | 3.749 *** | 4.087 *** | 4.106 *** | 4.935 *** |
| <i>No. of observations</i> | 646,956 | 646,956 | 646,956 | 646,956 | 646,956 |
| <i>F</i> | 20,723.28 | 18,828.86 | 17,078.72 | 17,082.70 | 16,738.26 |
| <i>Adjusted R</i> ² | 0.204 | 0.208 | 0.209 | 0.209 | 0.206 |
| <i>Δ R</i> ² vs base model | | 0.004 | 0.005 | 0.005 | 0.002 |

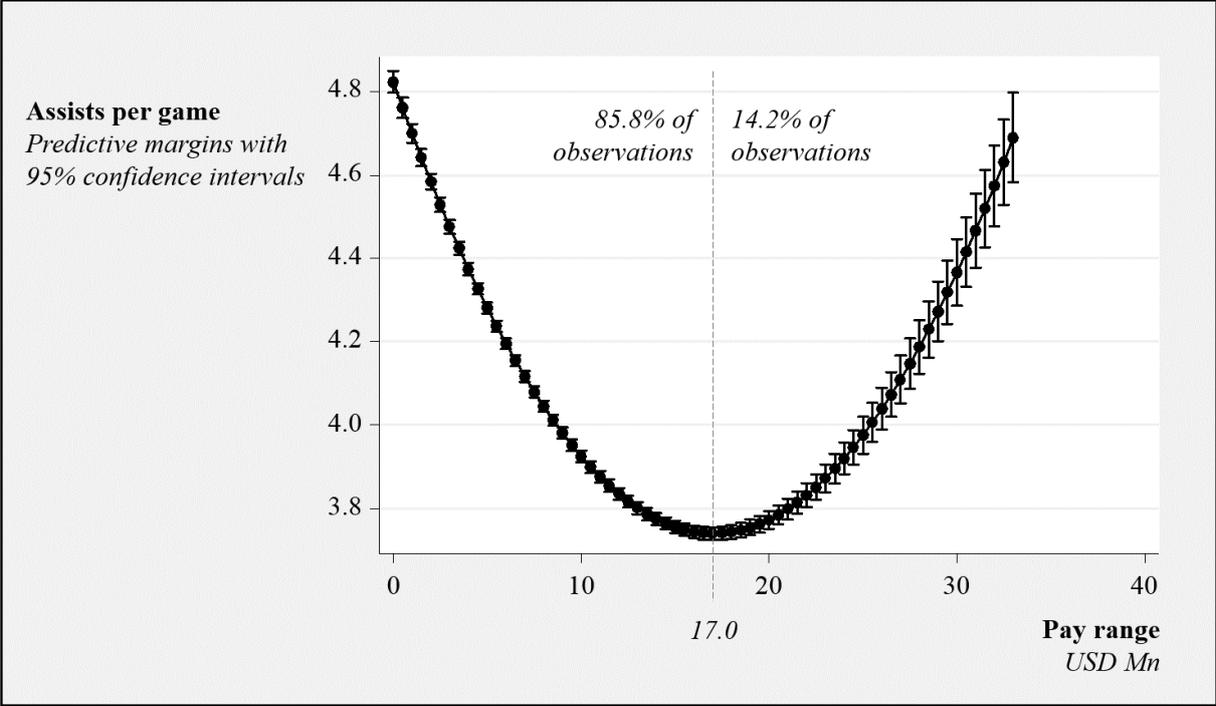
Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 20 provides the results of the regression analyses testing the effects of horizontal pay variation on cooperation as measured by *assists per game* according to H1_a and H1_b. The base model includes control variables only, to which the linear term (Model 1a) and the squared term (Model 1b) of *pay range* as the primary measure of horizontal pay variation are added. In Model 2 and Model 3, *pay range* is then substituted by *pay cap* and *pay dispersion*, respectively, as alternative measures of pay variation.

Results

While the linear regression in Model 1a results in a negative relationship between *pay range* and *assists per game* in line with the majority of studies that suggest horizontal pay variation to primarily have detrimental effects, adding the squared term in Model 1b reveals a U-shaped relationship as predicted by H1_b, resulting in the rejection of H1_a. Model 2 shows almost identical results based on *pay cap* and, thus, supports the virtual equivalence of *pay range* and *pay cap*. Model 3, too, provides support for H1_b based on pay dispersion, albeit at a lower coefficient of determination. I re-ran the analyses employing each team’s average pay in USD Mn as an additional control variable to ensure that the observed positive effect of high levels of horizontal pay variation were not confounded with that of higher overall team quality driven by positive outliers (cf. Appendix A, Table A-11 and Table A-12). The direction and significance of the observed effects remained unaffected, as did the explanatory power of each model, providing evidence for the robustness of my findings.

Figure 7: The Link between Pay Range and Assists per Game



Results

The results of Model 1b are illustrated in Figure 7 **Error! Not a valid bookmark self-reference.** *Assists per game* decrease with *pay range* up to a difference of USD 17.0 Mn between the lowest and highest salaries in the team. Beyond that level, *assists per game* increase with *pay range*. The majority of 85.8% of the observations in the sample are found on the downward-sloping part of the curve. That is, the status-based benefits of pay variation only appear to come to fruition fully at very high levels of horizontal pay variation, resulting in increased cooperation.

Table 21: Results of Regression Analyses Testing Effects of Pay Variation on *Efficiency per Game*

| Variable | Base Model: Controls only | Model 4a: Pay range (lin.) | Model 4b: Pay range (squ.) | Model 5: Pay cap (squ.) | Model 6: Pay disp. (squ.) |
|---------------------------------------|------------------------------|-------------------------------|-------------------------------|----------------------------|------------------------------|
| <i>Pay range</i> | | - 0.080 *** | - 0.336 *** | | |
| <i>Pay range</i> ² | | | 0.012 *** | | |
| <i>Pay cap</i> | | | | - 0.344 *** | |
| <i>Pay cap</i> ² | | | | 0.012 *** | |
| <i>Pay dispersion</i> | | | | | - 2.497 *** |
| <i>Pay dispersion</i> ² | | | | | 0.466 * |
| <i>Relative pay</i> | 2.536 *** | 2.529 *** | 2.554 *** | 2.555 *** | 2.550 *** |
| <i>Pos.: C</i> | 1.315 *** | 1.278 *** | 1.306 *** | 1.307 *** | 1.286 *** |
| <i>Pos.: PF</i> | 1.130 *** | 1.223 *** | 1.129 *** | 1.293 *** | 1.159 *** |
| <i>Pos.: SF</i> | - 0.894 *** | - 0.878 *** | - 0.838 *** | - 0.836 *** | - 0.893 *** |
| <i>Pos.: SG</i> | - 1.153 *** | - 1.059 *** | - 0.979 *** | - 0.976 *** | - 1.125 *** |
| <i>Pos.: PG</i> | 0.114 | 0.141 * | 0.196 ** | 0.197 ** | 0.119 |
| <i>Team tenure</i> | 0.007 *** | 0.007 *** | 0.007 *** | 0.007 *** | 0.007 *** |
| <i>Age (days)</i> | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** |
| <i>Constant</i> | 23.448 *** | 24.021 *** | 25.076 *** | 25.155 *** | 25.224 *** |
| <i>No. of observations</i> | 646,956 | 646,956 | 646,956 | 646,956 | 646,956 |
| <i>F</i> | 2,383.91 | 2,164.04 | 1,993.39 | 1,996.59 | 1,928.37 |
| <i>Adjusted R</i> ² | 0.029 | 0.029 | 0.030 | 0.030 | 0.029 |
| <i>Δ R</i> ² vs base model | | < 0.001 | 0.001 | 0.001 | < 0.001 |

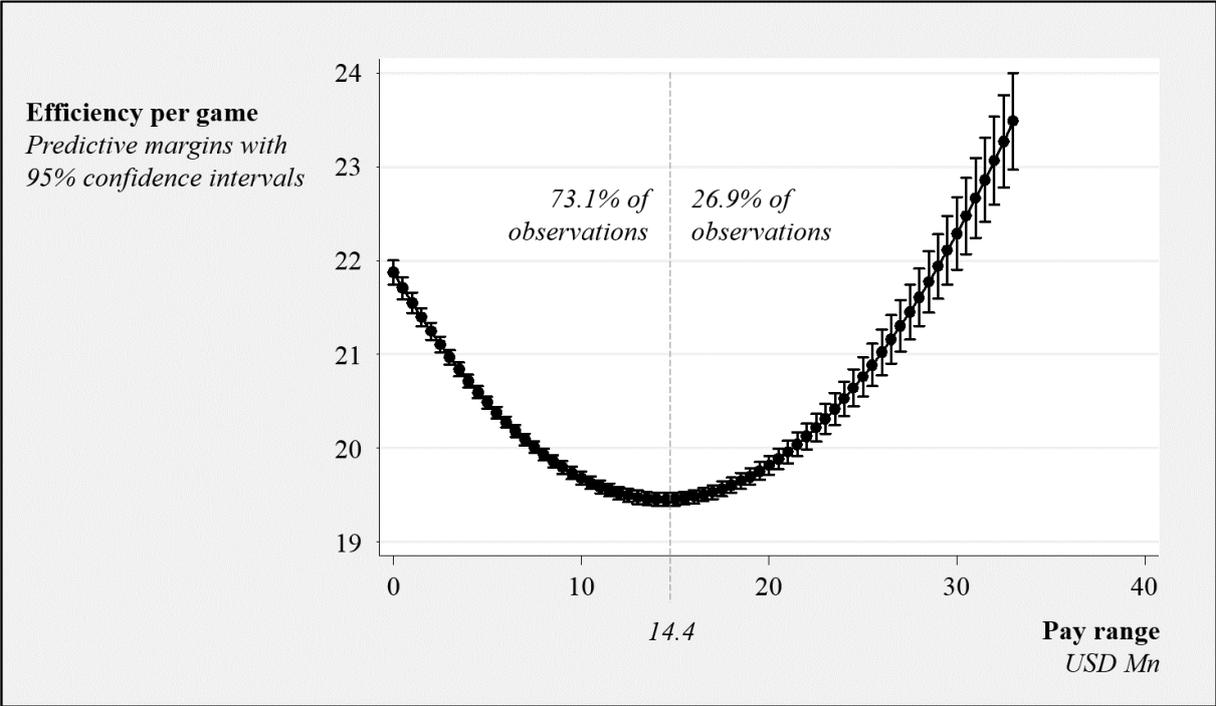
Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Turning our attention to the effects of horizontal pay variation on individual performance, Table 21 provides an overview of the tests of H2_a and H2_b. Like for *assists per game*, I find a U-

Results

shaped relationship between all three measures of horizontal pay variation and *efficiency per game* in Models 4b, 5, and 6, leading to the rejection of H2_a, which predicted an inverted U-shaped relationship. Even though the U-shaped relationship as proposed in H2_b is significant, the explanatory power of the model is marginal with measures of pay variation contributing in the realm of a tenth of a percent. Therefore, the support for H2_b I find requires cautious interpretation. Just as with my previous analysis of cooperation, however, the relationship between the pay variation measures and *efficiency per game* remains unaffected when average pay per team is included for all pay variation variables other than the now insignificant linear term of *pay dispersion* (cf. Appendix A, Table A-13). This mitigates the possibility of mistaking the effect of horizontal pay variation with that of absolute pay levels and hence supports the robustness of my findings.

Figure 8: The Link between Pay Range and Efficiency per Game



Results

Figure 8 illustrates the results of Model 4b. *Efficiency per game* decreases up to a *pay range* of USD 14.4 Mn, then increases. The majority of 73.1% of all observations are found on the downward sloping part of the curve, providing a hint to why most previous studies found a negative relationship, as I do when only allowing for a linear effect as in Model 4a. However, the fraction of observations on the upward sloping part of the curve is higher for *efficiency per game* than for *assists per game*, indicating that the mechanisms through which horizontal pay variation affects performance may not be limited to cooperation.

Table 22: Results of Regression Analyses Testing Effects of *Delta Pay Variation* on *Assists per Game*

| Variable | Base Model: Controls only | Model 7: <i>Delta pay range</i> |
|--|---------------------------|---------------------------------|
| <i>Delta pay range</i> | | 0.048 *** |
| <i>Relative pay</i> | 0.522 *** | 0.524 *** |
| <i>Position: center</i> | - 1.443 *** | - 1.443 *** |
| <i>Position: power forward</i> | - 0.445 *** | - 0.444 *** |
| <i>Position: small forward</i> | - 0.127 *** | - 0.129 *** |
| <i>Position: shooting guard</i> | - 0.467 *** | - 0.465 *** |
| <i>Position: point guard</i> | 3.876 *** | 3.876 *** |
| <i>Team tenure</i> | 0.001 *** | 0.001 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 3.358 *** | 3.310 *** |
| <i>No. of observations</i> | 504,198 | 504,198 |
| <i>F</i> | 19,093.99 | 16,976.62 |
| <i>Adjusted R²</i> | 0.233 | 0.233 |
| <i>Delta R² vs base model</i> | | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 22 displays the results of the analysis testing the relationship between changes in horizontal pay variation and cooperation. In support of H3_b, I find a positive link between *delta pay variation* and *assists per game*, leading to the rejection of H3_a. Increasing horizontal pay variation in a team appears to help establish and reinforce a sound and stable social hierarchy, to add clarity to interactions among teammates and, ultimately, to enhance cooperation on the

Results

individual level. However, caution is due in interpreting this finding, given the limited size and very low explanatory power of the observed effect.

Re-running the same analyses with *efficiency per game* as the dependent variable to test H4_a and H4_b provides the results shown in Table 23. As in all previous analyses, the hypothesis based on equity and expectancy considerations, H4_a, is rejected, while the status theory-based H4_b receives empirical support.

Table 23: Results of Regression Analyses Testing Effects of Delta Pay Variation on Efficiency per Game

| Variable | Base Model: Controls only | Model 7: Delta pay range |
|--|----------------------------------|---------------------------------|
| <i>Delta pay range</i> | | 0.248 *** |
| <i>Relative pay</i> | 2.379 *** | 2.389 *** |
| <i>Position: center</i> | 1.253 *** | 1.249 *** |
| <i>Position: power forward</i> | 1.130 *** | 1.137 *** |
| <i>Position: small forward</i> | - 1.073 *** | - 1.079 *** |
| <i>Position: shooting guard</i> | - 1.104 *** | - 1.094 *** |
| <i>Position: point guard</i> | 0.031 | 0.029 |
| <i>Team tenure</i> | 0.007 *** | 0.007 *** |
| <i>Age (days)</i> | - 0.001 *** | - 0.001 *** |
| <i>Constant</i> | 25.640 *** | 25.389 *** |
| <i>No. of observations</i> | 504,198 | 504,198 |
| <i>F</i> | 1,951.47 | 1,737.78 |
| <i>Adjusted R²</i> | 0.030 | 0.030 |
| <i>Delta R² vs base model</i> | | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Overall, status theory appears to be more suitable to explain the effects of horizontal pay variation in my sample compared to equity and expectancy theories alone. I find evidence of a U-shaped relationship between horizontal pay variation and both cooperation (H1_b) and performance (H2_b). In addition, increases in horizontal pay variation tend to enhance both cooperation (H3_b) and performance (H4_b). While I expected the explanatory power of pay variation for cooperation and performance to be rather limited given the plethora of other

aspects that affect each individual and team on the field, the low R^2 of the performance effects in particular requires cautious interpretation of the results. The next section will theoretically situate my findings, identify routes for future research, and provide recommendations for practitioners.

3.6 Discussion

3.6.1 Theoretical Implications

This study put the fairness approaches to examining horizontal pay variation – equity theory and expectancy theory – on the one hand and status theory as a so far neglected alternative approach on the other hand to a competitive test. Even though the latter emerged victorious in my analysis, I agree with Brown et al. (2003) that no single theory is sufficient to fully explain the relationship between compensational aspects, such as horizontal pay variation, and organizational outcomes. Given my findings, however, status-based explanations must at all times be considered in pay variation research. A team's pay hierarchy plays a significant role in establishing and reinforcing its social hierarchy by indicating whose contributions are valued the most. As such, it has the potential to facilitate task-oriented interactions, to help avoid and resolve inter-personal conflicts, to simplify the assignment of resources, rights, roles, and responsibilities, and, ultimately, to enhance cooperation and collective outcomes.

At the same time, I showed how exploring more complex patterns beyond linear effects may contribute to our understanding of pay variation effects. Had I stopped my analyses after setting up the linear models, I would have concluded that there is a negative relationship between horizontal pay variation and cooperation as well as performance and agreed with the majority of studies on the topic. By adding status theory to pay variation research, I was able to theoretically hypothesize, test, and find evidence for a curvilinear relationship. Further theory

building is required to fully grasp the complexity of pay variation effects including potential moderators.

The positive effects associated with increases in horizontal pay variation deserve particular attention. While previous studies have predominantly focused on cross-sectional analyses, I am among the first to do the inherently dynamic nature of horizontal pay variation justice in accordance with calls for more longitudinal research (Downes and Choi 2014). This approach provides two primary benefits: first, assessing changes in – rather than absolute levels of – pay variation facilitates the establishment of causal linkages, which has so far been a major challenge in the literature. Second, and even more importantly, changes in pay variation are likely to affect individual fairness perceptions, behavioral reactions, and, ultimately, organizational outcomes more strongly than absolute levels of pay variation do. Given that individuals in interdependent teams contribute to the collective along various dimensions, the relative values of which are usually ambiguous (Cook and Yamagishi 1983), and given that their contributions are subject to strong biases (Cowherd and Levine 1992, Kepes et al. 2009), they may be used to encountering some extent of unexplained pay variation in any team situation without perceiving it as particularly bothersome. They may even be used to the path-dependent nature of the pay structure lagging behind changes in actual value contributions. If, however, changes in horizontal pay variation are not aligned with team members' perceptions of the development of their value contributions – for example, if a low-pay individual perceives that he has developed from an unremarkable part of the team to a critical factor within it, but more established teammates receive larger raises on their already higher pay levels – strong emotional reactions are likely. As most organizational set-ups entail compensation schemes that have emerged over extended periods of time and that cannot be adjusted immediately to account

for shifts in relative contributions, changes in horizontal pay variation may be a more revealing research subject than absolute levels of pay variation.

What is more, I was among the first to measure cooperation directly rather than just inferring changes in cooperation behavior from observed performance effects. Despite their relatively low correlation, I find both cooperation and performance to be affected in very similar ways by horizontal pay variation, indicating that cooperation is in fact a major intermediate factor by which pay variation impacts performance. However, the considerably lower explanatory power of my models examining performance compared to those examining cooperation shows that other factors, such as motivation or confidence, may interfere with the effects of cooperation. A more nuanced understanding of the levers through which horizontal pay variation influences individual performance should thus be developed.

3.6.2 Limitations

Three germane limitations to this study should be addressed by future research endeavors. These refer to the specificities of the research setting, the size and explanatory power of the observed effects, and the issue of demarcating horizontal from vertical pay variation.

First, despite its benefits – highly interdependent teams, the archetypical mix between cooperation and competition with peers, and unparalleled data depth, breadth, and accuracy – the basketball research setting possesses several shortcomings of its own that may be considered to limit the external validity of my findings. These include: a relatively homogeneous sample of all-male, mostly African American subjects, who supposedly have high levels of ambition and discipline to pursue a professional career in sports; full transparency about each individual's income that is rare in other settings; and comprehensive and ceaseless performance feedback mechanisms based on performance metrics, the media, and fan engagement. While I am

convinced that the same effects could be equally observed in other, more diverse organizations, particularly in business, they may be most relevant to those settings that share some of the features described above, most prominently management consulting, banking, and other professional services. Despite the insights that sports settings have generated for pay variation research (Becker and Huselid 1992, Bloom 1999, Frey et al. 2013, Trevor and Wazeter 2006), validating my findings in other organizations may prove valuable to establish boundary conditions under which the different theories may bear more or less relevance.

Second, the explanatory power of the observed effects for cooperation is limited to around 0.5% and is, at best, marginal for performance at around 0.1%. In addition, the effect sizes are small, making *assists per game* vary by as little as one and *efficiency per game* by no more than four between the lowest and highest points on the curve, which may cast doubts upon the relevance of my findings. Considering the vast array of factors that affect cooperation and performance, however, I consider the effects quite notable. Given that basketball players need to decide within split seconds whether to pass the ball to a better positioned teammate or to attempt to score themselves, any minor effect in observable behavior may reflect considerable distortions in underlying attitudes. What is more, at the outstanding level of competition in the NBA, a single pass can make the difference between victory and defeat. Therefore, even *prima facie* minor effects may have considerable repercussions for organizational outcomes that should be examined in greater depth in future research.

Finally, the distinction between horizontal and vertical pay variation is not always clear. Taking sports teams as an example, do all players perform the same ‘job’? Or do a few superstars possess fundamentally different roles, such as Portugal’s star soccer player Cristiano Ronaldo at the 2016 European Cup Final, who virtually turned into a second head coach after having to leave the field due to an injury, a transformation that certainly no other player on the team could

have taken the liberty of performing? If the latter is the case, then some of the pay variation deemed horizontal in this study may in fact be vertical, which makes the consideration of arguments of tournament theory advisable. Future research may contrast the predictions based on status theory on the one hand and on tournament theory on the other hand in order to complete the picture.

3.6.3 Practical Implications

Practitioners in HR and leadership positions, too, may benefit from the findings of this study. I showed that pay structures can be used to strengthen a team's social hierarchy. Gradation in pay and, in particular, in raises can serve as a powerful signal to organizational members as to what roles they are expected to fulfill. Whereas pay as a signal of organizational value has predominantly been considered detrimental to fairness perceptions and cohesion in a collective (Brown et al. 2003), my findings indicate that they may actually be beneficial in clarifying expectations and defining desired member behaviors. Therefore, HR practitioners should strategically use compensation policies as a signal to develop a collective understanding of good employee behavior in their organizations.

For this signal to be effective, some degree of transparency both about performance metrics and compensation policies is required, which is also an agreed-upon prerequisite of positive pay variation effects from the perspectives of equity and expectancy theories (Downes and Choi 2014). HR practitioners should hence provide the workforce with access to reliable information on the criteria based on which variable pay components and raises are distributed for each job category in order to ensure their being perceived as legitimate so that the full benefits of pay variation can be reaped.

3.7 Conclusion

The results of this study suggest that considerations of status theory must not be left aside when examining the relationship between horizontal pay variation and individual-level cooperation as well as performance. In contrast to equity- and expectancy-based predictions and in line with status theory, I find a U-shaped relationship between horizontal pay variation and cooperation as well as performance, indicating that large pay differentials may facilitate the assignment and understanding of roles and responsibilities. Likewise, increases in horizontal pay variation are found to positively affect cooperation and – to a limited extent – performance, since they provide a clear signal as to what specific behaviors are most valued by organizations. Overall, status has the potential to play a critical role in further consolidating our understanding of pay variation in future research.

4. Paper III – Status as Insurance against Short-Term

Performance Fluctuations and Long-Term

Performance Decay¹⁵

4.1 Introduction

Individuals in groups have been argued to strive for status, i.e. a high position in the group's social hierarchy, for a variety of reasons. These include: more positive performance expectations as well as appraisals (Bothner et al. 2012, Ertug and Castellucci 2013); improved access to physical, social, and financial resources (Castellucci and Ertug 2010, Groysberg et al. 2011, Marr and Thau 2014) that enable higher performance in line with these more positive expectations and that ultimately result in higher personal rewards (Bendersky and Shah 2012); greater power, influence, and freedom to act (Bendersky and Hays 2012, Bunderson and Reagans 2011); higher self-efficacy, personal well-being, and health (Adler et al. 2000, Bothner et al. 2012, Kilduff and Galinsky 2013); and the inherent value of status with respect to favorable social comparisons itself (Fredrickson et al. 2010, Main et al. 1993). This last aspect is arguably the most essential one and comprises all of the above, as individual status is “perhaps the primary measure of individual success” (Kilduff and Galinsky 2013: p. 817) and as such “not only a means to an end but also an end in itself, an intrinsic component of an individual's utility function *in addition* to the pursuit of resources” (Huberman et al. 2004: p. 103).

¹⁵Eberhard, K. 2016c. Status as Insurance against Short-Term Performance Fluctuations and Long-Term Performance Decay. Unpublished Working Paper.

I put forward that status provides another benefit to the individuals who possess it, which has not yet been under the spotlight of scientific research: an insurance against unfavorable performance fluctuations both in the short and long terms. In the short term, I argue that high-status actors can experience significant periods of underperformance without being shorn of their opportunities to perform, while I expect a strong link between short-term performance fluctuations and opportunities to perform for lower-status actors. As a consequence, high status may not only help individuals secure more opportunities to perform for themselves, as has been indicated by previous research, but may also do so in a more reliable manner largely independent from short-term performance fluctuations.

In the long term, high-status actors tend to maintain their status due to its self-reinforcing nature (Magee and Galinsky 2008, Kilduff and Galinsky 2013). Accordingly, I expect status to be warranted to them ever more independently from the development of actual performance differentials compared to lower-status peers as they progress through their careers. More specifically, I argue that the awarding of high status will be strongly correlated with actual performance at early stages in an individual's professional career, but that this link will wane and, possibly, disappear at later career stages.

In sum, high status may serve as a potent protection from the negative consequences of both short-term performance fluctuations and long-term performance decay. I believe that these insurance features of high status bear particular emotional relevance for those actors who strive for and possess it when compared to other aspects such as access to resources, taking the predictions of Prospect Theory on loss aversion in general (Kahneman and Tversky 1979, 1984) and empirical findings on the threat of status loss in particular (Bothner et al. 2007, Marr and Thau 2014, Scheepers et al. 2009) into account. As a consequence, the insurance features of status demand scientific attention to complete the picture of how status and the ensuing benefits

Introduction

are distributed in a collective. As a first step to that objective, I develop hypotheses on the insurance features of status and test them using a large sample that covers 30 years of professional basketball in the NBA, which combines the advantage of unmatched data transparency on an extremely granular level with a setting of highly interdependent teams that I consider archetypical for a wide array of collaborative situations including, but not limited to, business organizations.

Through my study, I hope to contribute to the current state of research in three ways. First, I hope to establish, empirically assess, and exemplarily quantify the short- and long-term insurance features of status. In so doing, I do not only expand our understanding of why individuals strive for status attainment, but I also develop an initial impression of the relative importance of one central benefit of high status.

Second, I apply a dynamic perspective to status by taking a closer look at its self-reinforcing nature, the importance of which Magee and Galinsky (2008) stress by referring to it as a “historic and contemporary burning issue in the field of sociology” (p. 360). By linking individual-level status and performance over different time horizons, I contribute to a better understanding of the underlying mechanisms.

Finally, my quantitative assessment of status self-reinforcement will allow me to draw conclusions for a broader set of aspects related to career development. More specifically, I shed light into how advancements early in an individual’s career may render achievements at later stages dispensable, as the status gained early on becomes a major predictor of future performance appraisals. Given that the resulting incentive structure, which disproportionately rewards achievements at early career stages, may not appropriately capture performance differentials and may thus be perceived as unfair by low-status staff members in particular, there may be substantial implications for HR practices in businesses and other organizations.

This paper will continue as follows: After a brief review of the relevant literature on status with particular focus on its self-reinforcing nature and the threat associated with status loss, hypotheses on the insurance features of status will be developed. Subsequently, these hypotheses will be tested empirically, the results of which are followed by a discussion of the implications my findings have for research and practice.

4.2 Theoretical Background

4.2.1 Status

For the purpose of this study, I define status as an individual's position within a collective's social hierarchy. In this definition, the term social hierarchy refers to "an implicit or explicit rank order of individuals or groups with respect to a valued social dimension" (Magee and Galinsky 2008: p. 354). The two primary characteristics that collectives are likely to value have been found to be competence and commitment to the group's common goal as perceived by the other members (Anderson and Kilduff 2009a, Kilduff and Galinsky 2013). Social hierarchies are "an unavoidable reality of group life" (Bunderson et al. 2016: p. 1265), as they emerge in any collective of people pursuing a common objective, be it through the formal assignment of roles or informal negotiations about respect and deference – or, in most team situations, a combination of the two (Bendersky and Hays 2012, Ravlin and Thomas 2005). The emergence of a social hierarchy is essential to the effective functioning of the collective, as it facilitates the assignment of resources and responsibilities, clarifies expectations, simplifies decision-making, and helps resolve interpersonal conflicts (Groysberg et al. 2011, Halevy et al. 2012, Overbeck et al. 2005).

Given that high status, i.e. a high position within the collective's social hierarchy, is associated with various material benefits – e.g., greater access to resources and more positive performance

appraisals (Bendersky and Hays 2012, Bothner et al. 2012, Bunderson and Reagens 2011) – as well as with the inherent value of being well-respected itself (Fredrickson et al. 2010, Huberman et al. 2004), and given that the rank-ordering within a social hierarchy is perception-based and thus negotiable, members will compete to improve their relative standing within the group. They primarily do so by increasing their apparent value contribution as perceived by the other members in terms of both competence and commitment, for instance by displaying excessive support for their teammates (Anderson and Kilduff 2009a, Bendersky and Shah 2012). By contrast, trying to force oneself into a high-status position by means of dominant behavior or making explicit status claims tends to be punished by the group (Bunderson and Reagens 2011, Ridgeway 1987, Webster et al. 2004). The pursuit of status has been found to be a universal characteristic of human interactions indifferent from national cultures, albeit at varying degrees of relevance (Huberman et al. 2004). In a steady environment, a group's social hierarchy tends to become stable over time due to a number of self-reinforcing mechanisms described in the following.

4.2.2 Status Reinforcement

Magee and Galinsky (2008) propose four mechanisms by which expectations reinforce social hierarchies: First, 'expectancy confirmation' labels a bias by which high-status individuals are generally ascribed higher levels of competence compared to their low-status peers and are consequentially evaluated in a more favorable light (Bothner et al. 2012). For instance, if a superstar basketball player misses the deciding shot of the game, observers are more likely to brush it aside as him having had a bad day or adverse circumstances than when a less esteemed player misses the same shot, who may be judged to just not have been up to the challenge.

Second, 'behavioral confirmation', also known as the 'Pygmalion effect' (Rosenthal and Jacobson 1968, Eden and Shani 1982), goes even one step further, describing how people's

expectations shape their interactions with a specific individual and consequentially limit or even determine how this individual acts and performs. This effect is further enhanced when the individual's awareness of others' expectations translates into corresponding self-expectations: For instance, in their landmark experiment with military trainees, Eden and Ravid (1982) showed that randomly selected individuals that were described to their supervisors as having particularly high potential performed objectively better through the course of a seven-week training program than the control group. In the long term, a virtuous circle of positive expectations, enhanced leadership, improved motivation, and superior performance is likely to ensue (Eden 1984), confirming high-status actors' positions and hence reinforcing established social hierarchies.

Third, others' expectations may become prescriptive and turn into collectively accepted behavioral norms, breaches of which are punished by means of social rejection (Rudman 1998). Such punishments can be expected to be more immediate and severe for those individuals at the bottom of the hierarchy compared to those higher up, "especially when low-status individuals act above their rank" (Magee and Galinsky 2008: p. 375), and may result in the further loss of status (Fragale et al. 2012). To avoid negative consequences, individuals will hence attempt to behave in compliance with their own perceived status positions and, thus, unintentionally further strengthen the status quo.

Fourth, Magee and Galinsky (2008) argue that high-status individuals are provided with higher-quality opportunities to prove their value to the collective, while low-status individuals are given less visible and desired roles with little prestige to gain, which further cements existing social hierarchies.

In addition to these expectation-based mechanisms, other authors argue that social hierarchies emerge and reinforce themselves through dyadic social exchanges (Bienenstock and Bianchi

2004). For example, Benjamin and Podolny (1999) show how high-status actors are not only better able to affiliate with other high-status actors, but they also benefit more from such affiliations in defending and advancing their positions than low-status actors do. More generally, one's own status is found to be strongly influenced by the status of one's affiliates (Castellucci and Ertug 2010, Ertug and Castellucci 2013).

Finally, in light of the essential functions that a social hierarchy provides for collective task attainment, even disadvantaged members tend to accept it as a necessity as long as the criteria by which status is distributed are perceived as legitimate and fair (Berger et al. 1998, Kalkhoff 2005, Zelditch 2001). According to Magee and Galinsky (2008), “an ideological acceptance of inequality – that differential levels of status and power across groups are legitimate – and a belief that people get what they deserve” (p. 377) provides the basis for members rationalizing, rather than critically questioning, their own and all other members' positions within the social hierarchy.

In sum, all members of a group “collectively reify the hierarchy they jointly constitute” (Bothner et al. 2012: p. 418) through the emergence of and compliance with collective expectations, their choices of relationships, and shared belief systems. Nevertheless, those who possess high status will contribute disproportionately to stabilizing the status quo in an attempt to defend their positions, as the next section will outline.

4.2.3 Status Loss Aversion

The predictions of Prospect Theory, according to which individuals attribute multiple times as much importance to losses than to gains in terms of both emotional and behavioral reactions (Kahneman and Tversky 1979, 1984), have been applied to status research both with respect to the mere threat of status loss as well as actual status loss.

As regards the former, Pettit et al. (2010) provide experimental evidence that individuals do not only attach more value to status when recalling the risk to lose status compared to the opportunity to gain status, but they are also willing to invest more resources and effort in protecting their current status than in further increasing it. Bothner et al. (2007) obtain similar results in their real-life study of NASCAR drivers, who respond with more aggressive and risk-seeking behavior to being threatened in their position by a group of approaching followers than to opportunities to improve their position by attacking a group of vehicles in front of them. In addition to insights about the relative importance of status losses and gains, this finding allows cautious inferences about the absolute relevance of status, for which the drivers risk crashing and, hence, seriously damaging their health. In addition to these emotional and behavioral responses, Scheepers et al. (2009) find evidence of physiological responses to the threat of status loss: Confronted with unstable inter-group status differences, high-status experiment participants displayed higher pulse pressure and systolic blood pressure than in a stable environment, particularly when members of the lower-status group from which the threat originated were present. In sum, individuals appear to closely monitor whether their status positions are threatened and, if so, exhibit strong defensive reactions along multiple dimensions.

As regards the latter, Askin and Bothner (2016) argue that those who actually lose status will engage in more risky behavior in an attempt to recover lost ground. In their empirical study focusing on the organizational level, academic institutions suffering from status loss were inclined to increase prices as a signal of quality to potential customers, which may aggravate the crisis if perceived as unjustified. Similar behavioral patterns are likely to be found on an individual level. What is more, status loss may have a detrimental effect on performance, as Marr and Thau (2014) find in their laboratory experiment. After losing status, formerly high-status individuals perform significantly worse not only compared to their high-status peers who

did not lose status, but also compared to low-status individuals that have lost a comparable amount of status. The authors trace this performance decrease back to the subjects' experiencing self-threat, i.e. "challenges or contradiction to a central view of the self" (Marr and Thau 2014: p. 224) that makes it impossible to perform at previous levels, even if motivation and effort are unaffected.

Taking all of the above – the self-reinforcing nature of status as well as individuals' pronounced aversion against status loss – into consideration, I argue that the insurance features of status represent a significant driver of why individuals strive for status enhancement beyond immediate material rewards and innate value. Subsequently, hypotheses will be developed to describe how high status protects individuals from some of the negative consequences of short-term performance fluctuations and long-term performance decay.

4.3 Hypotheses

4.3.1 Short Term

Magee and Galinsky (2008) argue that, as a result of the expectancy confirmation processes described above, high-status individuals are provided with higher-quality opportunities to prove their competence under conditions that favor – if not predetermine – success, whereas low-status individuals have to make do with less desirable and visible roles. As an example, the authors describe how a researcher that successfully obtains a position at a highly ranked academic institution is likely to benefit from additional funding as well as more and higher-quality research and teaching assistants, which is likely to further enhance his research productivity.

I argue that this process described as "opportunity accumulation" (Magee and Galinsky 2008: p. 375) does not only positively affect the quality, but even more importantly the quantity of

opportunities that present themselves to high-status individuals, which Magee and Galinsky (2008) only touch upon implicitly. The exemplary researcher described above, for instance, may not only be asked to join more renowned academic peers in collaborative research projects and support more prestigious academic journals as co-editor, but he may also have a broader range of opportunities – i.e., a higher number of research projects and journals – that he can choose from or even exploit in parallel. The latter approach is likely to not only further strengthen his professional network, which serves as a multiplier for additional opportunities; but it will also decrease the risk associated with any single one of these opportunities not materializing as planned as well as enhance the chances of at least one out of multiple opportunities turning into a particularly remarkable and prestigious success.

The same effect can be expected in a wide range of other application fields: for instance, a high-status venture capitalist will benefit not only from access to higher-quality investment targets, but also from a wider range of entrepreneurs from more diverse industries seeking his support, resulting in a more balanced investment portfolio; a celebrity violinist will not only be able to land a contract with a particularly renowned orchestra and music label, but will also be invited to numerous guest performances at music festivals, charity events, and TV shows, allowing him to further grow his fan base; and a star soccer player will not only be able to land a well-paying contract with a renowned club, but may also establish himself as the club's principal free-kick and penalty shot taker, augmenting the number of scoring opportunities and, ultimately, goals on his record, which will further raise his popularity with spectators. Based on the predictions of the current state of research, I thus hypothesize that high-status individuals will be given more opportunities to perform than low-status individuals.

HYPOTHESIS 1 (H1). *High-status individuals will receive more opportunities to perform than low-status individuals independently from recent individual performance.*

Taking this line of reasoning one step further, I argue that high-status individuals will not only receive more opportunities to perform compared to low-status individuals, but that this differential in the number of opportunities granted will be particularly pronounced in the immediate aftermath of individual failure. That is, low-status individuals will be shorn of opportunities to perform if they fail to meet expectations, whereas high-status individuals will experience more leniency, as expectancy confirmation processes reinforce the established social hierarchy.

As outlined above, high status favorably biases not only performance expectations, but also performance evaluations (Bothner et al. 2012, Ertug and Castellucci 2013). As negative deviations from expectations are likely to trigger stronger psychological responses than positive deviations, I argue this bias to be particularly strong when high-status individuals underperform. Such a situation represents a profound deviation from observers' expectations and may thus trigger ex-post rationalizations as a corrective mechanism, such as external attributions to extraordinary conditions. For example, if a renowned CEO joins an ailing company, but fails to turn it around, observers are more likely to attribute it to a non-supportive management team, unprecedented turmoil in the industry, or overwhelming burdens from his predecessor, rather than to a lack of competence, compared to a comparable situation in which a lower-status manager has taken over.

By contrast, exceptionally good performance by low-status individuals will not result in equally strong reactions in the opposite direction, as directing opportunities away from high-status

individuals to low-status individuals that exceed expectations requires overcoming considerable inertia caused by the self-reinforcing mechanisms of social hierarchies.

In conclusion, I advocate a more nuanced relationship between status and opportunities to perform. While both high- and low-status individuals that perform well will be provided with performance opportunities, those that the latter receive will more strongly depend on their recent performance, while the former can rely on their status to secure future opportunities despite potential fluctuations in their value contributions. As a consequence, high-status individuals benefit from status functioning as an insurance in the short term.

HYPOTHESIS 2 (H2). *The quantity of opportunities to perform that low-status individuals receive will depend more strongly on recent individual performance than the quantity of opportunities to perform that high-status individuals receive.*

4.3.2 Long Term

As status continually reinforces itself, I expect gradually lower levels of performance to be required from an individual to maintain his high-status position over the long term. In general, perceived value contributions to the group, based on which high status is granted (Anderson and Kilduff 2009a), are likely to be highly correlated with actual individual performance, particularly in settings in which each member's contribution is transparent and objective metrics can be applied. Accepting the proposition that status is self-reinforcing, however, implies that this link between status and perceived value to the collective as well as objective performance must become weaker over time: once an individual's high status has been established, each consecutive confirmation of that high status at later points in time can be argued to require a somewhat lower level of actual performance than the one before. As a result,

high status protects those who possess it from the loss of status and the benefits that go along with it when experiencing a gradual and moderate deterioration in performance over the long term, which represents another insurance feature of high status.

HYPOTHESIS 3 (H3). *For each time period, the performance level required from an individual to be awarded high status declines with the number of previous (consecutive) periods in which high status was awarded to that individual.*

In order to further our understanding of this long-term insurance feature of status, I will attempt to quantitatively contrast the complementary parts that actual performance and previously acquired status play in determining an individual's status position at any given point in time. More specifically I will focus on two stages of an individual's career that are particularly relevant for my analysis of status reinforcement: on the one hand, I will take a closer look at the beginnings of a career, during which initial status is formed and the reinforcing mechanisms begin to catch hold. On the other hand, I will examine the closing stages of a professional career, during which – at least in my sports setting – physical condition begins to limit an individual's capacity to continue to perform at usual levels.

In the early stages of their professional careers, individuals have yet to find their positions in the social hierarchy of the group of people they work with. Their peers will quickly form impressions of their relative value contributions, which results in the newcomers finding themselves in a specific position in the status hierarchy based on implicit consensus of the other members. However, even if their value contributions in a given time period are perceived as particularly high, resulting in an immediately high status position, I expect the reinforcing mechanisms to not yet be fully active. Although initial displays of exceptional performance will raise expectations for subsequent periods, expectancy and behavioral confirmation processes

will not yet unfold as strongly, as the relatively short time interval in which value contributions to the team were observed still leaves considerable room for adjustments of the original perception. That is, the high status obtained early in an individual's career will only be confirmed in subsequent time periods if that individual's performance, which drives his perceived value contributions to the team, continues to be exceptional with previously acquired status playing only a minor role.

HYPOTHESIS 4_A (H4_A). *In a given time period in the early stages of an individual's career, individual performance is a stronger determinant for the awarding of high status to that individual than is high status awarded in previous periods.*

In the late stages of a professional career, by contrast, I expect the status reinforcement mechanisms to be fully active. As a result, high-status individuals will find their positions in the social hierarchy confirmed even in the light of their performance potentials gradually and moderately declining. Consequentially, the frequency and consistency of previously awarded status may replace performance as the main predictor of status awarded in subsequent periods. Therefore, I argue that status gained over the course of a professional career serves as an insurance against performance decay over the long term, particularly towards the end of a professional career.

HYPOTHESIS 4_B (H4_B). *In a given time period in the late stages of an individual's career, high status awarded in previous periods is a stronger determinant for the awarding of high status to an individual than is individual performance.*

In sum, I expect high status to provide individuals with a higher quantity of opportunities to perform compared to their peers and to protect them from the loss of such opportunities when faced with performance fluctuations in the short term. In the long term, status obtained over the course of a career will tend to be confirmed through newly awarded status at later stages despite declining performance, which allows individuals in high status positions to permanently profit from the material and psychological benefits that come with them. This dual insurance effect of high status in the short and long terms adds another powerful incentive to why individuals strive for high status positions in groups' social hierarchies.

4.4 Methods

4.4.1 Research Setting and Sample

To test my hypotheses, I examine individual playing times, performance, and awards in the NBA over the course of a thirty-year period both on a per-game (H1 and H2) and a per-season (H3, H4_a, and H4_b) basis. Professional sports – especially team sports such as NBA basketball – have frequently served as the stage for research into organizational behavior (e.g., Pfeffer and Davis-Blake 1992, Halevy et al. 2012, Ertug and Castellucci 2013), as they provide a number of notable benefits over other organizational settings (Berman et al. 2002, Frey et al. 2013): On the one hand, sports offer unmatched insights into actual individual behaviors through a wide array of detailed and accurate performance measures thanks to meticulous tracking by the media and a growing range of dedicated sports data enterprises. What is more, team sports can be considered a controlled 'laboratory-like' setting, in which the actions of all individuals involved are subject to equal rules and clear collective objectives, which allows for relatively unbiased performance assessments when compared to the intricacies associated with individual evaluations in other interdependent team settings. Basketball provides particularly valuable

insights, given the virtually seamless coverage of actions on the field due to the relatively small field and team sizes of only five players on either side, which results in all players on the pitch being continually engaged in either offensive or defensive tasks, which are ultimately reflected in performance data.

On the other hand, findings from sports settings bear validity for a wide array of other organizational contexts, most notably the business world. In particular, basketball has been argued to accurately approximate the behavioral patterns likely to be observed in business organizations, as players cooperate on interdependent tasks much like employees do in team settings (Keidel 1987), which have become more and more important and customary in business organizations over the last decades (Lazear and Shaw 2007).

My dataset, which was collected from <http://www.basketball-reference.com/> between July and November 2015, comprises all players' NBA games from the 1985/86 to the 2014/15 seasons, including both regular seasons and playoffs. Even though data would have been available all the way back to 1946/47, the first NBA season¹⁶, I restrict myself to this 30-year time span to account for the fact that not all performance metrics were available before the 1985/86 season. Overall, a total of 629,012 observations – i.e. unique player-game combinations – have been included in the sample to test H1 and H2. For the purpose of my long-term analyses to test H3, H4_a, and H4_b, these data have been aggregated into 11,208 *player-season* rather than *player-game* combinations. Subsequently, I will hence provide separate variable description and correlation tables for the short and long terms, particularly given that the same control variables are applied over both time horizons.

¹⁶Then called the Basketball Association of America (BAA), which was renamed NBA in 1949 after merging with the competing National Basketball League (NBL).

4.4.2 Dependent Variables

In this study, I will focus on two dependent variables: with respect to the short term (H1 and H2), I will focus on opportunities to perform; with respect to the long term (H3, H4_a, and H4_b), I will be concerned with awards of high status in a given period – i.e., a given season – based on experts' performance evaluations.

Opportunities to perform. I use *minutes played* per game to measure the opportunities to perform granted to each player. Playing time in league games represents the most relevant time for professional basketball players to perform, as these games – as opposed to training sessions as well as friendly and pre-season matches – immediately determine a team's success in any given season and are watched by numerous spectators whose collective sentiments are likely to influence a club's decision-makers.

According to NBA regulations (NBA 2011), each team has a roster of no more than 15 players. Out of these 15, 12 to 13 players are placed on the so-called Active List of available players, the selection of whom can be adjusted on a game-by-game basis. From the Active List, at least eight players must be available to play, implying that not all players on the Active List must be employed in the game, for instance when multiple players are injured and unable to play. During playing time, free substitution applies, i.e. players may leave and enter the field for other players without numerical limitations. Coaches will attempt to grant as much playing time as possible to their best players, but will have to account for the fact that it is physically challenging to play an entire game of 48 minutes – let alone potential overtime, if no winner can be determined during regular time – as well as tactical measures, such as avoiding players being sent off for too many fouls early in the game. As a consequence, playing time will vary in accordance with coaches' expectations as to which players can contribute the most to winning the game.

Methods

Minutes played have been measured accurately to the nearest minute until the 2004/05 season and to the nearest second from then on, a minor difference in measurement over time that I consider tolerable in consideration of the benefits of a larger sample and the standard deviation of almost 12 minutes (cf. Table 24). Values average at around 24 minutes and 26 seconds per game and range from zero minutes, rounded off from a few seconds of playing time prior to the 2004/05 season, to 63 minutes¹⁷.

Table 24: Short-Term Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|-----|-------------|------------------------------------|---------|--------|--------|--------|--------|
| 1 | Dependent | <i>Minutes played</i> | 629,012 | 24.430 | 11.820 | 0 | 63 |
| 2 | Control | <i>Relative pay</i> | 629,012 | 1.163 | 1.016 | 0.004 | 8.105 |
| 3 | Control | <i>Position: center</i> | 629,012 | 0.330 | 0.470 | 0 | 1 |
| 4 | Control | <i>Position: power forward</i> | 629,012 | 0.359 | 0.480 | 0 | 1 |
| 5 | Control | <i>Position: small forward</i> | 629,012 | 0.341 | 0.474 | 0 | 1 |
| 6 | Control | <i>Position: shooting guard</i> | 629,012 | 0.344 | 0.475 | 0 | 1 |
| 7 | Control | <i>Position: point guard</i> | 629,012 | 0.255 | 0.436 | 0 | 1 |
| 8 | Control | <i>Team tenure</i> | 629,012 | 124 | 177 | 1 | 1,489 |
| 9 | Control | <i>Age (days)</i> | 629,012 | 10,010 | 1,488 | 6,581 | 15,769 |
| 10 | Independent | <i>Ten-game average efficiency</i> | 629,012 | 0.423 | 0.169 | -5.949 | 12.514 |
| 11 | Independent | <i>All-NBA alumnus</i> | 629,012 | 0.080 | 0.271 | 0 | 1 |

High status awarded. In my long-term analysis, I use *All-NBA elect*, a binary variable describing whether or not a player was voted to be part of the First or Second All-NBA Team at the end of a given season, as dependent variable. Since the 1946/47 inaugural season, a panel of broadcasting representatives and sportswriters has selected two five-player teams from all active NBA players to be honored as the best players at the end of each season. In 1988, a third five-player team has been added, which I exclude from my analysis to ensure longitudinal

¹⁷Dale Ellis set the all-time record of 69 minutes played in a single game when his Seattle SuperSonics lost to the Milwaukee Bucks in the fifth overtime on November 9th, 1989 – however, as this game was only the fourth in that season for Seattle, no value for *ten-game average efficiency* (cf. chapter 4.4.3) could be provided for that observation, resulting in its exclusion from the analysis.

Methods

consistency. In the 30-year period under analysis, 300 nominations to the All-NBA First and Second Teams were awarded to 77 different individuals out of 11,208 player-season combinations (cf. Table 25).

It is important to note that the NBA does not provide any specific voting criteria for the All-NBA teams. As a consequence, the experts, who have not only full access to comprehensive performance data but also, assumedly, the knowledge and experience needed for a sound evaluation, vote according to their individual assessments of who demonstrated the best performance.

Table 25: Long-Term Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|-----|-------------|---|--------|-------|-------|---------|--------|
| 1 | Dependent | <i>All-NBA elect</i> | 11,208 | 0.012 | 0.110 | 0 | 1 |
| 2 | Control | <i>Relative pay</i> | 11,208 | 1.017 | 0.983 | 0.002 | 8.105 |
| 3 | Control | <i>Position: center</i> | 11,208 | 0.332 | 0.471 | 0 | 1 |
| 4 | Control | <i>Position: power forward</i> | 11,208 | 0.352 | 0.478 | 0 | 1 |
| 5 | Control | <i>Position: small forward</i> | 11,208 | 0.327 | 0.469 | 0 | 1 |
| 6 | Control | <i>Position: shooting guard</i> | 11,208 | 0.330 | 0.470 | 0 | 1 |
| 7 | Control | <i>Position: point guard</i> | 11,208 | 0.249 | 0.432 | 0 | 1 |
| 8 | Control | <i>Team tenure</i> | 11,208 | 99 | 161 | 1 | 1,489 |
| 9 | Control | <i>Age (days)</i> | 11,208 | 9,952 | 1,518 | 6,581 | 15,769 |
| 10 | Independent | <i>Season average efficiency</i> | 11,208 | 0.392 | 0.168 | -4.719 | 3.893 |
| 11 | Independent | <i>Total All-NBA nominations</i> | 11,208 | 0.110 | 0.814 | 0 | 15 |
| 12 | Independent | <i>Cons. All-NBA nominations</i> | 11,208 | 0.039 | 0.451 | 0 | 13 |
| 13 | Independent | <i>Season average efficiency (normalized)</i> | 11,208 | 0.000 | 1.000 | -30.394 | 20.821 |
| 14 | Independent | <i>Total All-NBA nominations (normalized)</i> | 11,208 | 0.000 | 1.000 | -0.135 | 18.292 |
| 15 | Independent | <i>Cons. All-NBA nominations (normalized)</i> | 11,208 | 0.000 | 1.000 | -0.086 | 28.716 |

4.4.3 Independent Variables

I will apply two pairs of independent variables to the short-term (H1 and H2) and long-term (H3, H4_a, and H4_b) sets of analyses, each of which comprises one performance-related and one status-related variable.

Recent individual performance (short-term). For my short-term analyses, *ten-game average efficiency (TGAE)*, i.e. the unweighted mean of each player's efficiency scores per minute played in each of the last ten games prior to the focal game, will serve as the independent variable for recent individual performance. Efficiency is arguably the most commonly used metric in NBA basketball to measure overall performance, as it combines the benefit of comprehensive coverage of all offensive and defensive actions on the field with unmatched intuitiveness. In simple terms, efficiency counts all individual actions on the field that contribute to one's own team scoring – points¹⁸, assists, offensive rebounds, defensive rebounds, blocked shots, and steals – and subtracts the number of individual actions that take away scoring chances from one's own team – field goals missed, free-throws missed, and turnovers. I divide efficiency by minutes played in a given game to avoid biases caused by the fact that positive actions typically outweigh negative ones and use the unweighted average over the last ten games before any given game under analysis. Through this average, I hope to level fluctuations caused by bad luck and players 'having got up on the wrong side of the bed', but to capture short-term fluctuations in players' actual potential to perform that can be expected to be noted by club officials – most notably, the coach responsible for the line-up – and spectators alike. In other words: It is unlikely that a player's performance in a single game by itself is an adequate predictor for his performance in the following game, but a player's performance over a ten-game period is likely to provide valid cues about his performance potential for the eleventh game. At the same time, with roughly three to four games played per

¹⁸While technically unweighted, efficiency does in reality assign a higher relevance to points scored, as successful throws other than free-throws result in two or three points being awarded to the scoring team. As a result, for instance, the steal and the assist leading to a scoring opportunity will only increase the corresponding players' efficiency values by one each – more specifically, the assist will only contribute to that player's efficiency if it actually results in a score – whereas the scoring player will increase his efficiency by two or three, depending on whether he took the shot from in front of or from behind the three-point line.

Methods

week, a ten-game period can still be considered short-term compared to a full season of 82 games, not including playoffs, let alone a player's whole career. The *TGAE* for each individual i and each game \tilde{g} can thus be summarized by the formula:

$$TGAE(\tilde{g}, i) = \frac{1}{10} \times \sum_{g=\tilde{g}-10}^{\tilde{g}-1} \frac{(PT_{g,i} + AST_{g,i} + REB_{g,i} + STL_{g,i} + BLK_{g,i}) - (FGM_{g,i} + FTM_{g,i} + TOV_{g,i})}{MP_{g,i}}$$

where *PT* is the number of points scored, *AST* the number of assists, *REB* the number of offensive and defensive rebounds, *STL* the number of steals, *BLK* the number of blocks, *FGM* the number of field goals missed, *FTM* the number of free-throws missed, *TOV* the number of turnovers of the ball to the opposing team, and *MP* the number of minutes the player has been in the game.

High status. I use *All-NBA alumnus*, a binary variable indicating whether or not a player has ever before in his career been voted into the First or Second All-NBA Team, to measure high status. Although the social hierarchy is collectively construed based on valued social dimensions that are not always fully transparent for outside parties and may slightly differ from one team to another (Magee and Galinsky 2008, Anderson and Kilduff 2009a), awards such as being elected into the All-NBA teams represent a strong signal of value that is closely observed by teammates and hence positively influences the winner's status position. Therefore, I use *All-NBA alumnus* as a simple yet effective measure that unambiguously identifies the most recognized players in the league as opposed to attempting to reconstruct the hierarchies of each team, which appears to be an unfeasible endeavor given the large sample and limited interaction possibilities with the 2,137 players involved.

Methods

Individual performance over an entire season (long-term). I use *season average efficiency (SAE)*, i.e. the mean of a player's efficiency scores per minute across all games of the season in which that player has played, to measure long-term performance. Again, I use the per-minute metric to account for different playing times across players. Accordingly, the *SAE* for each individual i and the set of all games played by that individual in each season S_i , including regular-season and playoff games, can be summarized by the formula:

$$SAE(S_i, i) = \frac{1}{|S_i|} \times \sum_{g \in S_i} \frac{(PT_{g,i} + AST_{g,i} + REB_{g,i} + STL_{g,i} + BLK_{g,i}) - (FGM_{g,i} + FTM_{g,i} + TOV_{g,i})}{MP_{g,i}}$$

where the same variable definitions apply as for the short term.

High status awarded in previous periods. I use *total All-NBA nominations*, i.e. the total number of times a player has been elected into the First or Second All-NBA Team prior to a given season, and *consecutive All-NBA nominations*, i.e. the number of back-to-back seasons prior to a given season that a player has been elected into the First or Second All-NBA Team, to measure how frequently and consistently individuals have been awarded high status over their careers. I use both variables alternatively to assess whether the sheer amount of awards or their being consistently awarded without interruption over multiple periods drives status reinforcement.

4.4.4 Control Variables

In my analysis, I control for each player's relative pay compared to his teammates, his position on the field, his age, and his tenure with a given team.

Relative pay. I divide each player's salary in a given year by his team's average salary in the same year to calculate *relative pay*. I do so to ensure that the effects of status that I intend to examine are not mixed up with clubs and coaches succumbing to the sunk-cost fallacy, which

has been found to significantly affect the extent to which players receive playing time in the NBA: Staw and Hoang (1995) show how players that have been drafted early – and thus earn higher amounts of money¹⁹ – are granted more playing time and traded away less quickly when performance is dissatisfactory. The authors attribute this finding to the sunk-cost fallacy, the – from an economist’s standpoint – irrational tendency to further direct resources (i.e., playing time) to bad investments (i.e., underperforming players) in an attempt to recoup the resources already invested (i.e., a high salary, an early draft pick), even though they should be economically irrelevant. Given the full transparency over individual player salaries due to the salary cap regulations and the enormous media and fan attention, coaches may feel pressurized to utilize their most ‘expensive’ players more than their performance levels justify.

Player position. I include one binary variable for each of the five positions on the field, out of which each individual in my sample can alternate between up to three. I do so to account for the different physical requirements these positions pose to players, as a consequence of which playing times may vary by player position. What is more, the two All-NBA teams consist of five players each, each of whom is assigned to one of the five positions. Accordingly, a season’s third best power forward may not be part of the All-NBA teams, even though the election board may agree, for instance, that his performance had been better than that of the second best point guard. By controlling for player positions, I avoid distortions caused by the differential awarding of status based on players’ roles on the field.

¹⁹The CBA that governs the NBA precisely defines the salaries that rookie players receive in their first seasons based on their draft positions alone. The resulting salary distribution among rookies is quite differentiated (NBA 2011): For instance, the overall first pick of the 2014/15 NBA Draft earned USD 4.592 Mn in his first season, compared to USD 1.998 Mn for the overall 10th pick, USD 1.215 Mn for the overall 20th pick, and USD 0.911 Mn for the overall 30th pick. Massey and Thaler (2005) find that early picks tend to be highly overvalued in the National Football League (NFL), a finding that is by extension also applicable to the NBA, resulting in an even higher likelihood of disappointing performance by overpaid players and, thus, a higher risk of coaches succumbing to the sunk-cost fallacy.

Age. I control for each player's *age* in days at the beginning of each season to account for the fact that older players have had the chance to accumulate more status than their younger peers. What is more, less experienced players may go through stronger fluctuations in their performance levels, which are likely to affect the playing times they are granted.

Team tenure. Finally, I control for *team tenure*, i.e. the number of games a player has played for a given club without playing for other clubs in between. *Team tenure* may enable players to familiarize themselves with aspects such as teammates' playing styles and coaches' practice preferences that allow them to perform more consistently than players who have just joined their clubs. What is more, higher *team tenure* may facilitate building up local status in the team that may ultimately affect consideration for league-wide awards such as the All-NBA teams.

4.4.5 Model Specification

I employ OLS regression to test the hypotheses focusing on the short term (H1 and H2) and a probit model to test the hypotheses focusing on the long term (H3, H4_a, and H4_b) in order to account for the dependent variable *All-NBA elect* being binary. The results of both sets of analyses are described in the following chapter.

4.5 Results

4.5.1 Short Term

Table 26 provides the correlations for all variables used in the short-term analyses, which are consistently below 0.5 for all pairs of variables other than those that describe incompatible positions on the field. The fact that almost all correlations are significant ($p < 0.05$) is mainly driven by the immense size of the sample and requires considerable caution in interpreting the results with particular consideration of effect strengths and explanatory power.

*Results***Table 26: Short-Term Variable Correlations**

| No. | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-----|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|--------------|--------------|
| 1 | <i>Min. played</i> | 1.000 | | | | | | | | | | |
| 2 | <i>Relative pay</i> | 0.446 | 1.000 | | | | | | | | | |
| 3 | <i>Pos.: C</i> | -0.074 | 0.148 | 1.000 | | | | | | | | |
| 4 | <i>Pos.: PF</i> | -0.016 | 0.100 | 0.398 | 1.000 | | | | | | | |
| 5 | <i>Pos.: SF</i> | 0.070 | 0.007 | -0.335 | 0.048 | 1.000 | | | | | | |
| 6 | <i>Pos.: SG</i> | 0.071 | -0.073 | -0.501 | -0.460 | 0.148 | 1.000 | | | | | |
| 7 | <i>Pos.: PG</i> | 0.046 | -0.093 | -0.411 | -0.435 | -0.358 | 0.213 | 1.000 | | | | |
| 8 | <i>Team tenure</i> | 0.279 | 0.435 | 0.031 | -0.003 | -0.041 | -0.032 | -0.012 | 1.000 | | | |
| 9 | <i>Age (days)</i> | 0.006 | 0.247 | 0.071 | 0.017 | -0.011 | 0.009 | 0.004 | 0.248 | 1.000 | | |
| 10 | <i>TGAE</i> | 0.360 | 0.363 | 0.191 | 0.149 | -0.088 | -0.170 | -0.082 | 0.248 | -0.014 | 1.000 | |
| 11 | <i>All-NBA alumnus</i> | 0.230 | 0.454 | 0.024 | 0.011 | -0.028 | 0.001 | 0.000 | 0.358 | 0.255 | 0.280 | 1.000 |

Note: Correlations in bold are significant at $p < 0.05$.

Table 27 summarizes the findings of my short-term analyses to test H1 and H2. As the base model with only control variables included shows, *minutes played* vary by player positions with centers – arguably the physically most challenging position – receiving the least, and point guards in their critical role as playmakers receiving the most playing time. What is more, *relative pay* is correlated with playing time, while *age* and *team tenure* play minor, albeit significant ($p < 0.01$), roles.

Ten-game average performance, which is introduced in Model 1, is found to have a significant ($p < 0.01$) and strong positive relationship with *minutes played*, increasing the explanatory power of the model by as much as 4.7 percentage points compared to the base model. To test H1, which predicted a positive relationship between status and playing time independently from recent performance, I include *All-NBA alumnus* in Model 2 and both *All-NBA alumnus* and *TGAE* in Model 3. The results do not support H1: While high status appears to have a significant ($p < 0.01$) and positive effect on playing time when recent performance is neglected (Model 2), the effect is minor, as the binary variable does not even affect playing time by as much as a

Results

minute per game and the resulting change in explanatory power is limited to less than 0.1 percentage points. More importantly, high status is found to have a significant ($p < 0.01$) and *negative* relationship with playing time when recent performance is controlled for (Model 3). As there is no conclusive evidence of high status resulting in consistently longer playing times independently from status, H1 is rejected.

Table 27: Results of Regression Analyses Testing Effects of Recent Performance and Status on Opportunities to Perform

| Variable | Short-term base model: Controls only | Model 1: TGAE | Model 2: All-NBA | Model 3: TGAE + All-NBA | Model 4: TGAE x All-NBA |
|--------------------------------------|--|------------------|---------------------|-------------------------------|-------------------------------|
| <i>TGAE</i> | | 17.018 *** | | 17.134 *** | 18.024 *** |
| <i>All-NBA alumnus</i> | | | 1.204 *** | - 0.497 *** | 7.834 *** |
| <i>TGAE x All-NBA alumnus</i> | | | | | - 14.741 *** |
| <i>Relative pay</i> | 5.112 *** | 4.221 *** | 4.997 *** | 4.262 *** | 4.313 *** |
| <i>Pos.: C</i> | - 1.175 *** | - 1.625 *** | - 1.137 *** | - 1.644 *** | - 1.646 *** |
| <i>Pos.: PF</i> | 0.754 *** | 0.378 *** | 0.754 *** | 0.376 *** | 0.414 *** |
| <i>Pos.: SF</i> | 1.952 *** | 2.278 *** | 1.983 *** | 2.267 *** | 2.258 *** |
| <i>Pos.: SG</i> | 1.662 *** | 2.077 *** | 1.654 *** | 2.083 *** | 2.101 *** |
| <i>Pos.: PG</i> | 2.633 *** | 2.619 *** | 2.638 *** | 2.617 *** | 2.614 *** |
| <i>Team tenure</i> | 0.009 *** | 0.006 *** | 0.008 *** | 0.006 *** | 0.007 *** |
| <i>Age (days)</i> | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** |
| <i>Constant</i> | 26.089 *** | 17.679 *** | 26.423 *** | 17.484 *** | 17.554 *** |
| <i>No. of observations</i> | 629,012 | 629,012 | 629,012 | 629,012 | 629,012 |
| <i>F</i> | 26,000.21 | 29,473.04 | 23,181.29 | 26,537.67 | 24,444.47 |
| <i>Adjusted R²</i> | 0.249 | 0.296 | 0.249 | 0.297 | 0.300 |
| <i>Δ R² vs base model</i> | | 0.047 | < 0.001 | 0.048 | 0.051 |

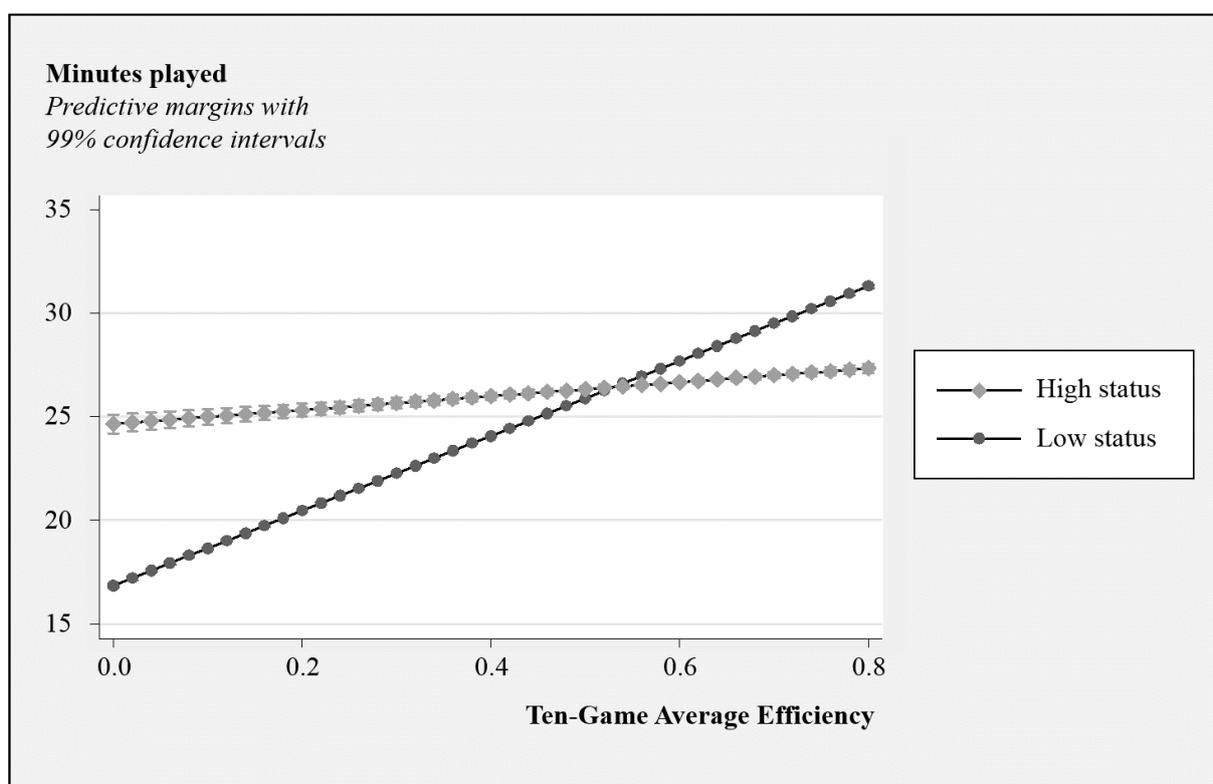
Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

In order to test H2, which predicted that high status mitigates the variability of playing times caused by short-term performance fluctuations and thus fulfills an insurance function for high-status individuals, I add the interaction term of *TGAE* and *All-NBA Alumnus* in Model 4. The results provide support for H2: Both recent performance and status are found to have significant ($p < 0.01$) and strongly positive relationships with playing time, while the interaction term, too,

Results

is significant ($p < 0.01$), but strongly negative. Accordingly, the link between recent performance as measured by *TGAE* and opportunities to perform as measured by *minutes played* appears to be significantly weaker for high-status individuals than for low-status individuals. Figure 9 illustrates this relationship for both high- and low-status individuals with *TGAE* values in the range of roughly two standard deviations to either side of the mean.

Figure 9: The Link between Recent Performance and Opportunities to Perform for Different Status Levels



In sum, high status appears to protect its possessors’ opportunities to perform from the negative consequences of performance fluctuations in the short term in accordance with H2, but it does not generally result in more opportunities to perform, as opposed to what H1 predicted. Consequentially, I find that high status functions as an insurance against opportunities to perform being taken away, but does not necessarily lead to more opportunities to begin with.

Results

The following chapter will complement this short-term perspective with an analysis of the long-term hypotheses.

4.5.2 Long Term**Table 28: Long-Term Variable Correlations**

| No. | Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-----|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|
| 1 | <i>All-NBA elect</i> | 1.000 | | | | | | | | | | | |
| 2 | <i>Relative pay</i> | 0.222 | 1.000 | | | | | | | | | | |
| 3 | <i>Pos.: C</i> | -0.032 | 0.128 | 1.000 | | | | | | | | | |
| 4 | <i>Pos.: PF</i> | -0.015 | 0.102 | 0.365 | 1.000 | | | | | | | | |
| 5 | <i>Pos.: SF</i> | -0.024 | 0.029 | -0.344 | 0.040 | 1.000 | | | | | | | |
| 6 | <i>Pos.: SG</i> | -0.003 | -0.049 | -0.491 | -0.445 | 0.143 | 1.000 | | | | | | |
| 7 | <i>Pos.: PG</i> | 0.044 | -0.069 | -0.406 | -0.422 | -0.335 | 0.202 | 1.000 | | | | | |
| 8 | <i>Team tenure</i> | 0.230 | 0.465 | 0.029 | 0.006 | -0.017 | -0.014 | -0.005 | 1.000 | | | | |
| 9 | <i>Age (days)</i> | 0.056 | 0.258 | 0.073 | 0.033 | -0.001 | 0.003 | 0.019 | 0.240 | 1.000 | | | |
| 10 | <i>SAE</i> | 0.185 | 0.379 | 0.186 | 0.163 | -0.070 | -0.157 | -0.072 | 0.274 | -0.007 | 1.000 | | |
| 11 | <i>Total All-NBA nominations</i> | 0.417 | 0.237 | -0.016 | -0.009 | -0.023 | -0.010 | 0.022 | 0.285 | 0.212 | 0.158 | 1.000 | |
| 12 | <i>Cons. All-NBA nominations</i> | 0.517 | 0.179 | -0.033 | 0.026 | -0.027 | -0.014 | 0.017 | 0.238 | 0.086 | 0.144 | 0.615 | 1.000 |

Note: Correlations in bold are significant at $p < 0.05$.

Table 28 provides the variable correlations for the long-term analyses, in which player-game combinations have been aggregated into player-season combinations. Despite the smaller, albeit still considerable, sample of 11,208 observations, the majority of the variable pairs are significantly ($p < 0.05$) correlated, which requires special caution in interpreting the results. In particular, the correlations between *All-NBA elect* as the dependent variable and *total All-NBA nominations* and *consecutive All-NBA nominations* as independent variables of 0.411 and 0.517, respectively, are striking, yet in line with my theoretical considerations. By contrast, the correlations between the two sets of independent variables – performance as measured by *SAE* on the one hand, previously awarded status as measured by *total* and *consecutive All-NBA*

Results

nominations on the other hand – are below 0.2, albeit significant ($p < 0.05$), which makes a separation and comparison of their effects on newly awarded status appear feasible.

Table 29: Results of Probit Analyses Testing Effects of Performance and Previously Awarded Status on Newly Awarded Status

| Variable | Long-term base model Controls only | Model 5: SAE | Model 6: SAE + Total All-NBA nominations | Model 7: SAE x Total All-NBA nominations | Model 6a: SAE + Cons. All-NBA nominations | Model 7a: SAE x Cons. All-NBA nominations |
|--|---|-------------------------|---|---|--|--|
| <i>SAE</i> | | 2.293 *** | 2.001 *** | 1.796 *** | 1.980 *** | 1.906 *** |
| <i>Total All-NBA nominations</i> | | | 0.261 *** | - 0.591 *** | | |
| <i>SAE x total All-NBA nominations</i> | | | | 1.337 *** | | |
| <i>Cons. All-NBA nominations</i> | | | | | 0.388 *** | - 0.553 ** |
| <i>SAE x cons. All-NBA nominations</i> | | | | | | 1.440 *** |
| <i>Relative pay</i> | 0.479 *** | 0.426 *** | 0.410 *** | 0.407 *** | 0.386 *** | 0.388 *** |
| <i>Pos.: C</i> | - 0.802 *** | - 0.935 *** | - 0.775 *** | - 0.714 *** | - 0.489 *** | - 0.439 ** |
| <i>Pos.: PF</i> | - 0.030 | - 0.144 | - 0.268 * | - 0.356 ** | - 0.488 *** | - 0.551 *** |
| <i>Pos.: SF</i> | - 0.317 *** | - 0.279 ** | - 0.222 | - 0.136 | - 0.070 | - 0.002 |
| <i>Pos.: SG</i> | - 0.223 ** | - 0.161 | - 0.084 | - 0.066 | - 0.113 | - 0.093 |
| <i>Pos.: PG</i> | 0.192 | 0.248 * | 0.248 * | 0.378 ** | 0.307 ** | 0.398 ** |
| <i>Team tenure</i> | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** |
| <i>Age (days)</i> | - 0.000 | - 0.000 | - 0.000 *** | - 0.000 *** | - 0.000 * | - 0.000 |
| <i>Constant</i> | - 2.587 *** | - 4.145 *** | - 2.022 *** | - 2.502 *** | - 3.359 *** | - 3.464 *** |
| <i>No. of observations</i> | 11,208 | 11,208 | 11,208 | 11,208 | 11,208 | 11,208 |
| <i>LR chi²</i> | 499.47 | 626.49 | 745.93 | 789.37 | 762.31 | 777.81 |
| <i>Pseudo R²</i> | 0.336 | 0.421 | 0.501 | 0.531 | 0.512 | 0.523 |
| <i>Δ R² vs base model</i> | | 0.085 | 0.165 | 0.195 | 0.176 | 0.187 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 29 illustrates the results of my testing the relationship between individual performance over an entire season as well as previously awarded status on the one hand and newly awarded status at the end of the season on the other hand as hypothesized in H3. I find both performance as measured by *SAE* (Model 5) and previously awarded status, whether measured by *total All-*

Results

NBA nominations (Model 6) or *consecutive All-NBA nominations* (Model 6a), to have significant ($p < 0.01$), strong, and positive effects on newly awarded status, which is further supported by the increases in McFadden's pseudo R^2 by between 8.0 and 9.1 percentage points, respectively. Therefore, in line with H3, which predicted lower levels of performance to be required to be awarded high status in a given period as a consequence of high status obtained in earlier periods, previous All-NBA nominations, whether consecutive or not, have the potential to replace performance in a given season as a determinant for All-NBA nominations at the end of that season.

Given the likely interdependence between previously awarded status and individual performance potentials, I furthermore include the interaction terms between *SAE* and *total* as well as *consecutive All-NBA nominations* in Models 7 and 7a, respectively. For both specifications of previously awarded status, the interaction term with performance is significant ($p < 0.01$) and positive, whereas the immediate effect of *total All-NBA nominations* ($p < 0.01$) and *consecutive All-NBA nominations* ($p < 0.05$) turns negative.

Figure 10 illustrates the resulting overall relationship between performance and the probability to be elected into the first two All-NBA teams according to Model 7 based on three exemplary levels of previously awarded status. In support of H3, the number of previous nominations visibly shifts the probability curve to the left, implying the same chances to be elected into one of the All-NBA teams at ever lower performance levels. Accordingly, if a high-status individual's performance gradually declines over time, the periodic confirmation of high status may remain unaffected, as performance is partially replaced by previously awarded high status as a determinant of newly awarded status.

Results

Figure 10: The Link between Performance and Newly Awarded Status for Different Levels of Previously Awarded Status²⁰

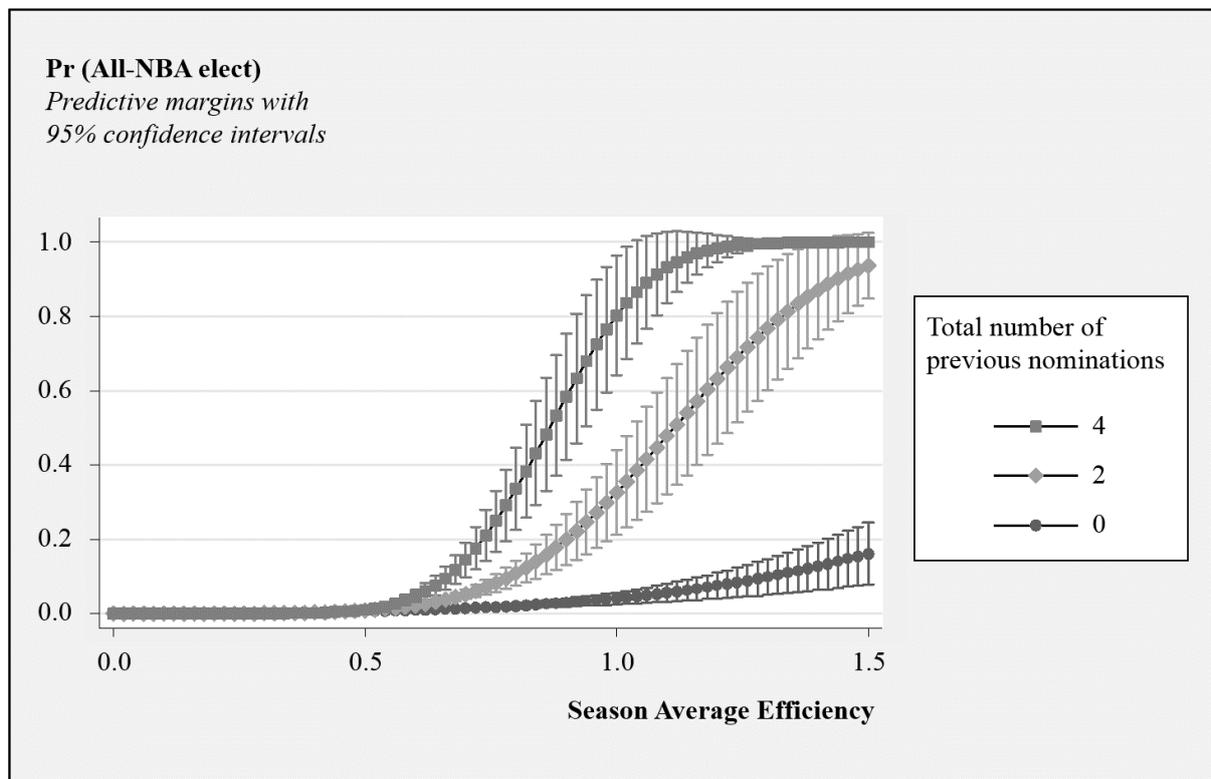


Table 30 summarizes my findings concerning the differential effects of performance and previously awarded status on newly awarded status at different career stages as hypothesized in H4_a and H4_b, for which I normalized the independent variables to ensure comparableness (cf. Table 25). I focus on the age group of players aged 27, which is the median age of all players, and younger, to empirically assess H4_a, which predicted performance to be a stronger determinant of status being newly awarded than previously awarded status at early career stages. I use a relatively large age group to account for the fact that it may not be uncommon

²⁰Please note that the three curves only begin to visibly disperse beyond an *SAE* of 0.5, or roughly one SD above the mean (cf. Table 25). I intentionally depict *SAE* values of up to 1.5, i.e. multiple SDs beyond the mean *SAE*, in order to highlight the extraordinary performance levels required to achieve high status for those players who have never been elected into the All-NBA teams before, even though the vast majority of player-season combinations are found in the left half of the graph.

Results

for players, who typically join the league in their early twenties, to need a few years to get used to playing at the professional level and to regularly secure a spot in the team.

Table 30: Results of Probit Analyses Testing Effects of Performance and Previously Awarded Status on Newly Awarded Status in Different Age Groups

| Variable | <i>Players aged 27 and younger</i> | | | <i>Players aged 30 and older</i> | | |
|--|---|--|--|---|--|--|
| | Long-term base model Controls only | Model 6b: SAE + Total All-NBA nominations | Model 7b: SAE x Total All-NBA nominations | Long-term base model Controls only | Model 6c: SAE + Total All-NBA nominations | Model 7c: SAE x Total All-NBA nominations |
| <i>SAE</i> (normalized) | | 0.353 *** | 0.370 *** | | 0.211 *** | 0.204 *** |
| <i>Total All-NBA nominations</i> (normalized) | | 0.714 *** | - 0.398 | | 0.256 *** | 0.050 |
| <i>SAE x total All-NBA nominations</i> (normalized) | | | 0.203 | | | 0.131 *** |
| <i>Relative pay</i> | 0.535 *** | 0.414 *** | 0.417 *** | 0.403 *** | 0.260 *** | 0.273 *** |
| <i>Pos.: C</i> | - 0.509 * | - 0.347 | - 0.330 | - 1.042 *** | - 0.842 *** | - 0.762 ** |
| <i>Pos.: PF</i> | - 0.249 | - 0.397 | - 0.397 | - 0.115 | - 0.541 ** | - 0.600 ** |
| <i>Pos.: SF</i> | - 0.321 | - 0.259 | - 0.224 | - 0.503 ** | - 0.470 | - 0.306 |
| <i>Pos.: SG</i> | 0.079 | 0.248 | - 0.249 | - 0.926 *** | - 0.827 *** | - 0.733 *** |
| <i>Pos.: PG</i> | 0.445 ** | 0.426 * | 0.479 * | - 0.158 | - 0.149 | 0.075 |
| <i>Team tenure</i> | 0.001 ** | 0.001 | 0.001 | 0.001 *** | 0.001 *** | 0.001 *** |
| <i>Age (days)</i> | - 0.000 | - 0.000 | - 0.000 | - 0.000 *** | - 0.001 *** | - 0.001 *** |
| <i>Constant</i> | - 3.605 *** | - 3.269 ** | - 3.374 ** | 1.386 | 9.154 *** | 6.996 *** |
| <i>No. of observ.</i> | 5,920 | 5,920 | 5,920 | 2,893 | 2,893 | 2,893 |
| <i>LR chi²</i> | 134.09 | 214.04 | 216.49 | 210.09 | 335.84 | 348.15 |
| <i>Pseudo R²</i> | 0.305 | 0.487 | 0.493 | 0.365 | 0.583 | 0.604 |
| <i>Δ R² vs base model</i> | | 0.182 | 0.188 | | 0.218 | 0.239 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

In contrast to my prediction, the effect of previously awarded status on newly awarded status ($p < 0.01$) appears to be almost twice as strong as that of individual performance ($p < 0.01$) in Model 6b, resulting in the rejection of H4_a. To account for the potentially disturbing correlation between the two independent variables, I add their interaction term in Model 7b, which results in neither *total All-NBA nominations* nor its interaction term with *SAE* having a significant

effect, while that of *SAE* persists ($p < 0.01$), which may be interpreted as weak support for H4_a. A potential explanation may be that high levels of status awarded early in a professional career – i.e., high status not only compared to other members of the same age cohort, but also compared to older, possibly more established players – are the consequence of very uncommon, clearly superior performance potentials. As a result, young individuals with consistently high status may mostly be rare generational talents who perform well above average even when they are temporarily unable to tap into their full potential. Nevertheless, the empirical evidence does not sufficiently support H4_a, resulting in its rejection.

To test H4_b, which argues that previously awarded status will be a stronger determinant of newly awarded status than individual performance at later career stages, I concentrate on players aged 30 or above, which roughly represents the upper quartile of my sample. Model 6c provides some support for H4_b, with *total All-NBA nominations* having a slightly stronger positive effect ($p < 0.01$) than *SAE* ($p < 0.01$). However, the difference is only about a fifth. What is more, including the interaction term between both independent variables (Model 7c) results in *All-NBA nominations* no longer being significant. As a consequence, the empirical support for H4_b must be taken with a grain of salt.

Subsequently, I will discuss the findings of this study in the wider context of the relevant literature, including its limitations and implications for practitioners.

4.6 Discussion

This study developed hypotheses on the insurance features of status in the short and long terms and empirically tested them using a large-scale sample covering 30 years of NBA basketball. It showed that, in the short term, the opportunities to perform that high-status individuals receive will depend less on recent performance fluctuations than those that low-status individuals

receive, even though high-status individuals were not generally found to receive more opportunities to perform than low-status individuals. In addition, I found that, in the long run, the performance level required to be awarded high status declines with the number of instances that high status has been awarded in previous periods. What is more, previously awarded status appears to be a slightly stronger driver of newly awarded status in the closing stages of a professional career.

4.6.1 Theoretical Implications

Overall, I consider my analyses to have three major implications for the current state of research: First, I add the insurance features of status as one additional facet to the already long list of reasons why individuals strive for status in the first place. Multiple benefits of having high status have been described in the literature, comprising both material benefits, such as greater access to resources (Bothner et al. 2012, Bendersky and Hays 2012), and non-material benefits, such as the immanent value of status itself (Adler et al. 2000, Kilduff and Galinsky 2013). Once individuals have enjoyed these benefits for the first time, the threat of giving them up again will evoke stronger emotional, behavioral, and physiological reactions than did the initial opportunity to gain them (Bothner et al. 2007, Pettit et al. 2010, Scheepers et al. 2009). By protecting these benefits, the insurance features of status are likely to alleviate the perceived threat of losing status and will hence provide particular value to individuals who possess it.

Second, I contribute not only to the breadth, but also to the depth of our understanding of the benefits of status by providing evidence that, as a refinement to the current state of research, high status may not generally result in “opportunity accumulation” (Magee and Galinsky 2008: p. 375), but rather reduce the dependence of high-status individuals’ opportunities to perform on their recent performance development. At least in my research setting, high-status individuals did not generally receive more playing time independently from their recent

performance. Even though I was only able to measure the quantity, but not the quality, of those opportunities – for instance, the coach may determine a specific player as the designated shooter in the majority of offensive moves without granting others less time on the field – the benefits of status may not universally apply. Rather, they are likely to dynamically come to the fore and fade into the background in response to changing conditions both within the team and the outside environment.

Finally, by applying a dynamic perspective, I provide insights into the wider context of status research, in which the link between status and performance has not always been clear (Ertug and Castellucci 2013). Even though some of my findings require cautious interpretation, an overall picture emerges in which the link between performance and status decouples over the course of an individual's professional career. While the self-reinforcing nature of status has been frequently discussed in the literature (Bothner et al. 2012, Magee and Galinsky 2008, Benjamin and Podolny 1999, Eden and Ravid 1982), I am among the first to observe its drivers over an entire working life and address their relative importance. On a wider scale, my findings may thus have implications for research into HR policies as well as related fields. Appraisal, remuneration, and promotion mechanisms in particular may be subject to path dependencies caused by early-career status accumulation and subsequent performance decline that fails to result in according adjustments to a group's social hierarchy. By deepening our understanding of potential inefficiencies in these mechanisms, research may create an impetus for the development of more meritocratic and effective HR policies.

4.6.2 Limitations

Like any study, the one at hand does not come without its limitations. To begin with, I have argued that the insurance features of status are particularly valuable to those individuals that possess it. However, my research setting – despite all its advantages – limited my ability to

measure whether or not individuals were aware of these insurance features, let alone whether or not they perceived them as particularly valuable in comparison to the other benefits they obtained through status. Future studies may attempt to design suitable experiments to assess the relative importance that individuals assign to each of the benefits of status, for example by juxtaposing pairs of configurations of these benefits in a series of discrete choices.

Second, I used All-NBA nominations, an honor awarded by outside experts, as a measure of status. The local social hierarchy within a group, however, may be quite different from the global status order that is externally observable (Overbeck et al. 2005). What is more, recent research suggests hierarchy be defined not as inequality in status, but rather “as cascading relations of dyadic influence” (Bunderson et al. 2016: p. 1266), arguing that hierarchy is not a feature of the individuals involved but rather of the relationships among them. Nevertheless, I believe All-NBA nominations to provide a valid representation of status positions in teams, particularly given that I deliberately focused on an award that only a very limited share of players receive over the courses of their careers and that is hence likely to bear exceptional relevance for the recognition and respect that the players in my sample pay to each other.

Third, I conducted my analysis using data from professional basketball in the NBA, which represents a highly specific research setting that provides a wide array of unique benefits, including the availability of various objective and consistently collected performance metrics on the player and game levels over extended periods of time as well as transparency about clubs’ hiring, remuneration, and line-up decisions. While I argue, like many others did before me (e.g., Keidel 1987, Berman et al. 2002, Frey et al. 2013), that team sports in general and basketball in particular provide an accurate representation of the functioning of teams in a plethora of other situations, most notably business organizations, the external validity of my findings nevertheless requires affirmation by research in other settings. This may also include

qualitative approaches, which would allow obtaining a comparable depth of insights into organizations such as business enterprises, in which performance measurement and the awarding of status are usually even more driven by complex collective interactions rather than ‘cold hard’ metrics accessible to any basketball enthusiast. In particular, as opposed to my all-male sample, incorporating gender differences in the sample may prove worthwhile, given that male subjects have been found to more strongly strive for status than female subjects (Huberman et al. 2004).

Finally, the relationship between performance and status may be more complex and multi-layered than objective performance data can capture, which may have contributed to some of my results being challenging to interpret. For instance, it is conceivable that a high-status player’s mere presence on the field has an inspiring, positive effect on his teammates’ performance that is not attributed to the high-status player in common performance metrics, but would nevertheless disappear if the high-status player left the field. Complementing my analyses with qualitative approaches may contribute to penetrating potential additional layers of the performance-status relationship.

4.6.3 Practical Implications

With a view to HR practitioners, my findings provide cues as to how to design more effective hiring and promotion mechanisms. Due to the self-reinforcing nature of status, late developers, who are unable to build status at early career stages as they only tap into their full potential further down the road, may not receive adequate development opportunities. For example, career paths in professional service firms tend to emphasize analytical skills at lower ranks, but interpersonal skills to build customer relationships and lead teams at higher ranks. As a consequence, a particularly sharp-minded entry-level employee may quickly obtain high status, resulting in rapid promotion, while a socially more skilled peer may be stalled by his less

impressive analytical skills. At more advanced career stages, the former may be given an overwhelming amount of opportunities due to his high status, even though he would be better off with fewer yet easier-to-handle opportunities, while the latter struggles to receive such opportunities in the first place, even though he may be better suited to rise to the challenge. HR practitioners' awareness for the potentially distorting effects of early status attainment over the course of a career may hence contribute to establishing more status-insensitive mechanisms that provide each individual in an organization with adequate opportunities and the support required based on their performance potentials at a given point in time.

On the other hand, my findings illuminate another facet of how top talents' choosing prestigious firms for their first employment is likely to positively contribute to advancing their careers when changing employers. Beyond the signal of quality that these high-status companies' names provide in young professionals' CVs, they may elicit more lenience in performance appraisals from other employers if these top talents temporarily struggle after changing jobs. To successfully participate in the 'War for Talent', less prestigious firms should define development programs for their top prospects that replicate this effect and that explicitly or implicitly emphasize the insurance features of these programs, for example by communicating its name, function, and relevance broadly throughout the organization and emphasizing the successes of former program participants.

In sum, I advocate a more deliberate handling of the role of status in performance appraisals and shaping career paths. HR practitioners should strive to avoid frictions caused by remuneration and promotion decisions that are considered unfair or illegitimate by low-status organizational members, while selectively leveraging status for the sake of acquiring and retaining the best talent for the organization. In doing so, status disparity as "an unavoidable

reality of group life” (Bunderson et al. 2016: p. 1265) may help both the organization and all of its members thrive.

4.7 Conclusion

The findings of my study suggest that the possession of high status functions as an insurance against short-term performance fluctuations and long-term performance decay. In the short term, the opportunities to perform that high-status individuals are given depend less on recent performance than those that low-status individuals are given, even though the latter do not generally receive fewer opportunities to perform than the former. In the long term, status reinforces itself, as high status awarded in previous time periods gradually lowers the performance level required to be awarded high status in any given later time period. As a consequence, previously awarded status may eventually become a more meaningful predictor of status newly awarded in a given time period than performance in that period towards the end of an individual’s professional career. In light of the loss aversion phenomenon, I argue the insurance features of status to be among the most relevant benefits that high status provides to those who possess it.

5. Overall Concluding Thoughts

5.1 Findings Summary

The objective of this dissertation was to advance our understanding of how status dynamics emerge in interdependent teams and how they affect organizational outcomes on the individual level, most notably cooperation and performance. In pursuit of this objective, the following three self-contained, yet interrelated, and theoretically relevant research questions were addressed:

Question I: How does an exogenous shock to a team's social hierarchy – the addition of a superstar – affect individual cooperation and performance?

Question II: How does horizontal pay variation affect individual cooperation and performance?

Question III: To what extent does high status protect its possessors from the negative consequences of short-term performance fluctuations and long-term performance decay?

These three research questions were dealt with in one stand-alone empirical paper each, including both detailed descriptions and discussions of their findings. The following summary aims at providing a condensed overview of the major outcomes of this dissertation.

First, Paper I examined the effects of a superstar joining a team on each team member's individual cooperation, effort, and performance from the viewpoint of status theory. I find that only those individuals that are highly similar to the incoming superstar in terms of their own status and/or skill-sets engage in what I call overt status conflicts by reducing their cooperation over very short periods of time in an attempt to defend their positions in the social hierarchy.

Overall Concluding Thoughts

Findings Summary

Those individuals with moderately similar status and/or skill-sets compared to the superstar, by contrast, behave more cooperatively – if not excessively cooperatively, given the lack of impact on overall performance – in an attempt to defend their relative positions compared to other team members, who may want to exploit the exogenous shock to shape the team’s social hierarchy to their advantage. I call this behavioral pattern, which is in line with Anderson and Kilduff’s (2009a) view that displays of excessive commitment to the team represent a major means by which individuals strive for status attainment, covert status conflict. Individual effort is only affected in the very short term of a few weeks after the superstar transfer, and positively so for high-status individuals as well as for individuals whose skill-sets considerably overlap with that of the star. With respect to performance, only those individuals that are very similar to the superstar in terms of status benefit from a sustainable long-term performance enhancement, providing further evidence that high-status affiliations are significantly more beneficial to high-status than to low-status individuals (Magee and Galinsky 2008).

Second, the relationship between horizontal pay variation and individual cooperation as well as performance as hypothesized by the three dominant theories in the field – equity theory, expectancy theory, and tournament theory (Downes and Choi 2014, Gupta et al. 2012) – on the one hand and status theory on the other hand was analyzed in Paper II. In line with the latter and in contrast to the former, I find a U-shaped relationship between horizontal pay variation and individual cooperation as well as performance, while increases in horizontal pay variation tend to enhance both individual cooperation and performance. Differences in pay provide clear signals of how an organization perceives the relative value contributions of its members and thus facilitate the establishment of an unambiguous social hierarchy with clear roles and responsibilities. Therefore, they induce individuals to focus their energies on the task at hand

Overall Concluding Thoughts

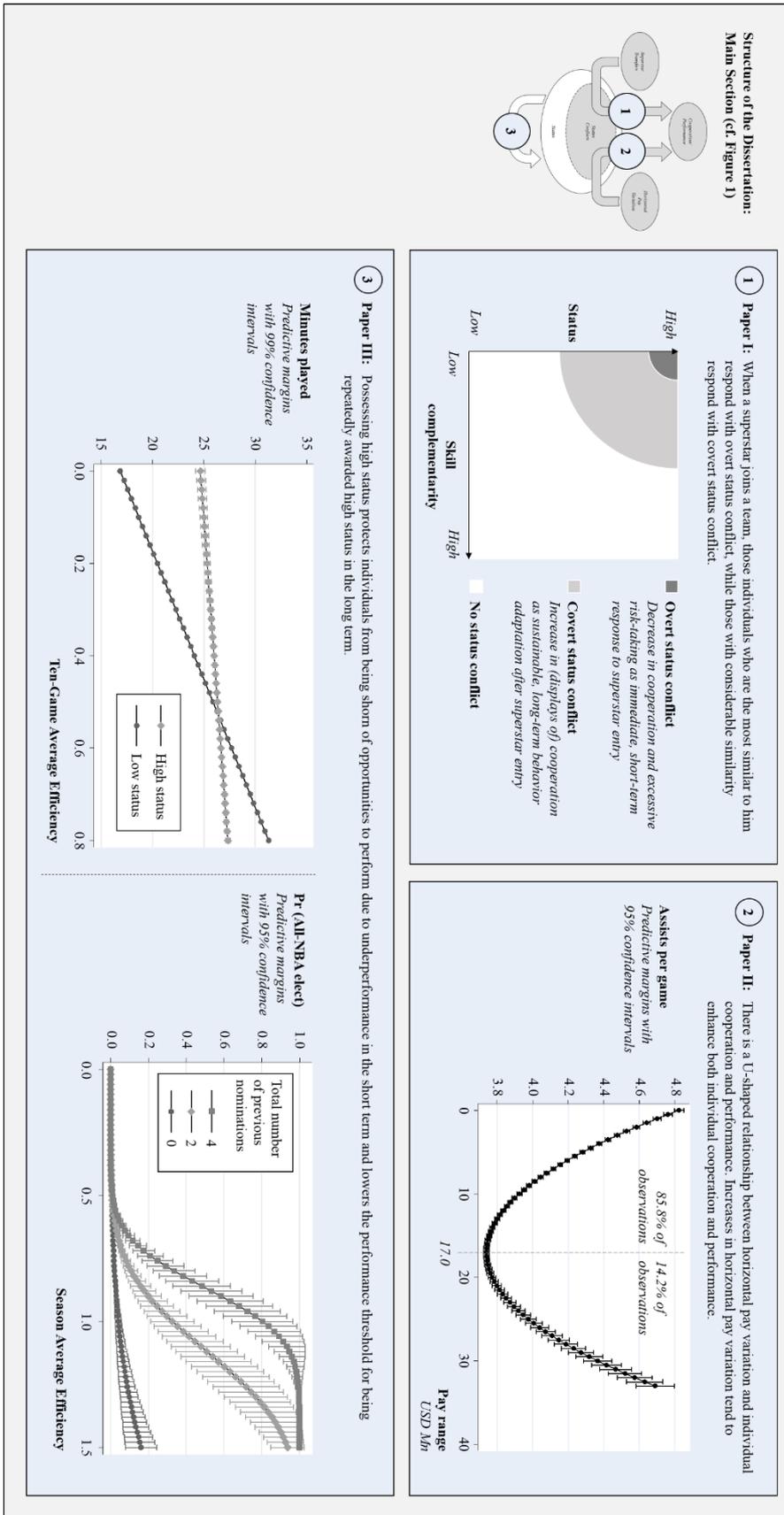
Findings Summary

rather than on individual status gain, which may be more common in organizational settings with less stable social hierarchies.

Finally, Paper III dealt with the insurance features of status. High status is found to protect individuals from opportunities to perform being taken away from them as a consequence of underperformance in the short term, even though high-status individuals do not generally receive more opportunities to perform than low-status individuals. Over the long term, the performance level required to be awarded high status declines with the number of occasions on which high status has been awarded in previous periods due to the self-reinforcing nature of status (Magee and Galinsky 2008). Towards the end of a professional career, previously awarded status is even found to be a slightly stronger predictor of newly awarded status than is performance in that period. In consideration of Prospect Theory (Kahneman and Tversky 1979, 1984), I argue that loss-averse individuals are likely to highly appreciate the insurance features of status, as they significantly enhance the stability of the other material and non-material benefits that go along with it, such as better access to resources and higher self-efficacy (Bothner et al. 2012, Kilduff and Galinsky 2013, Marr and Thau 2014).

These individual major findings of the three papers are graphically summarized in Figure 11. Jointly, they answer my three research questions: First, incumbent high-status team members respond to a superstar joining the team by engaging in either overt or covert status conflicts, depending on their similarity to the superstar in terms of both status and skill-sets. Second, both particularly high and particularly low levels of horizontal pay variation are positively related to individual-level cooperation, as are relative increases in horizontal pay variation over time. Finally, high status protects its possessors from being shorn of opportunities to perform as a consequence of short-term performance fluctuations and from losing their established status positions as a result of long-term performance decay.

Figure 11: Summary of Major Findings



Taking everything into consideration, these findings contribute to our understanding of how status is distributed in social hierarchies as they unfold and of how it dynamically influences individual behavior with a particular focus on cooperation.

5.2 Research Contribution and Future Directions

With this dissertation, I hope to have contributed to advancing the state of scientific research in three primary ways. First, by applying a dynamic perspective with a focus on the individual team member, I have shed light into how status in general and status conflicts in particular continuously shape individual behavior in multifaceted ways. By defining and differentiating between overt and covert status conflicts, I further hope to reconcile two implicitly opposing views of how individuals strive for status – excessive displays of competence and commitment (Anderson and Kilduff 2009a, 2009b) on the one hand, dysfunctional debates, avoiding each other, or even vindictive behavior (Bendersky and Hays 2012, Groysberg et al. 2011) on the other hand – by showing that both behavioral patterns may occur simultaneously, albeit by different sets of individuals. What is more, I have provided evidence that horizontal pay variation sends out a strong signal as to what contributions an organization values the most, very high levels of which therefore help stabilize a collective's social hierarchy and, ultimately, prevent status conflicts.

Second, I have provided insights into what drives individual status over the course of a professional career by examining the insurance features of status that originate from its self-reinforcing nature (Magee and Galinsky 2008).

Finally, the scientific contribution of this dissertation comprises showing how theoretical considerations of status may be relevant to a wider range of issues than those to which they have been applied to date. More specifically, I have shown how status theory can reconcile

Overall Concluding Thoughts

Research Contribution and Future Directions

some of the conflicting findings associated with horizontal pay variation and its effects on individual cooperation and performance in Paper II. In doing so, I hope to have fruitfully advanced our understanding of the phenomenon.

Several avenues for future research arise from the limitations described in each of the three stand-alone papers, the most vital ones of which I will summarize here. To begin with, it may be worthwhile to replicate my analyses in other organizational contexts to ensure the external validity of my findings, given the peculiarities of the NBA research setting, in particular the all-male, dominantly African American sample I used. In spite of sports having become an established setting for research into organizational behavior (Berman et al. 2002), further insights may be generated by looking into business organizations at a smaller scale in terms of the sample size in order to identify potential discrepancies between sports and the realm in which I believe my findings to bear the greatest relevance.

In addition, the findings of Papers I and II in particular have been characterized by a combination of high significance levels driven by the massive sample size and relatively limited effect strengths and explanatory powers given the wide array of other aspects that shape individual behaviors. What is more, the large sample based on archival data resulted in my having to settle for an outside perspective that needed to approximate internal status sorting by external status cues, namely awards, and was unable to incorporate personality-related information that have frequently been found to influence status dynamics (Anderson et al. 2008, Anderson and Kilduff 2009b, Kilduff and Galinsky 2013). Both these issues can be addressed by designing suitable experiments, in which the effects I have examined are even more easily discernible than in the quasi-controlled sports setting (cf. Appendix B). Furthermore, such experiments may help establish how much individuals value the insurance functions of

Overall Concluding Thoughts

Research Contribution and Future Directions

possessing high status, which I only derived theoretically in the context of Paper III, for instance based on a set of discrete choices.

Overall, I advocate status research to put an even stronger emphasis not only on dynamic, but even discontinuous developments within groups, as exemplified by the superstar entry scenario examined in Paper I. For example, the consequences of the status void caused by a high-status individual leaving a team may grant vital insights into a frequent, albeit yet-to-be understood, incident in many organizations. I expect doing so will rapidly advance our understanding of how social hierarchies influence cooperation and performance in teams. In consequence, it will provide guidance as to how teams as the primary form of organizing work in more and more settings can be made even more rewarding for the individuals involved and even more successful for their organizations.

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Appendix

Appendix A: Additional Analyses

Table A-1: Additional Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|------|-------------|--------------------------------|---------|-------|-------|-------|--------|
| 12 | Independent | <i>Relative pay</i> | 688,680 | 1.112 | 1.004 | 0.002 | 10.927 |
| 12' | Independent | <i>Relative pay (team)</i> | 628,106 | 1.121 | 0.977 | 0.003 | 7.980 |
| 12'' | Independent | <i>Relative pay (position)</i> | 628,106 | 1.114 | 0.998 | 0.003 | 10.766 |

Note: Superstars transferred (8,435 observations) excluded from sample.

Table A-2: Results of Additional Regression Analyses Testing Effects of Status on Cooperativeness

| Variable | Base model | Model 1': <i>Relative pay (team)</i> | Model 1'': <i>Relative pay (position)</i> |
|--|-------------|---|--|
| <i>Superstar entry</i> | 0.168 ** | - 0.135 | - 0.140 |
| <i>Relative pay (team)</i> | | - 0.809 *** | |
| <i>Superstar entry x relative pay (team)</i> | | 0.252 ** | |
| <i>Relative pay (position)</i> | | | - 0.721 *** |
| <i>Superstar entry x relative pay (position)</i> | | | 0.281 *** |
| <i>Pos.: C</i> | - 0.190 *** | 0.050 | - 0.113 ** |
| <i>Pos.: PF</i> | - 0.407 *** | - 0.287 *** | - 0.329 *** |
| <i>Pos.: SF</i> | - 0.611 *** | - 0.461 *** | - 0.490 *** |
| <i>Pos.: SG</i> | - 0.720 *** | - 0.665 *** | - 0.670 *** |
| <i>Pos.: PG</i> | 1.349 *** | 1.426 *** | 1.467 *** |
| <i>Team tenure</i> | - 0.003 *** | - 0.001 *** | - 0.001 *** |
| <i>Age (days)</i> | 0.000 *** | 0.000 *** | 0.000 *** |
| <i>Constant</i> | - 3.013 *** | - 3.296 *** | - 3.312 *** |
| <i>No. of observations</i> | 628,106 | 628,106 | 628,106 |
| <i>Gaussian Wald chi²</i> | 3,170.52 | 5,024.91 | 4,412.92 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.226 | 0.348 | 0.321 |
| <i>R² (overall)</i> | 0.094 | 0.135 | 0.126 |
| <i>Δ R² vs base model</i> | | 0.041 | 0.032 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-3: Results of Regression Analyses Testing Effects of *Relative Pay* on *Assists*

| Variable | Base model | Model 1': <i>Relative pay</i> |
|--|-------------------|--|
| <i>Superstar entry</i> | - 0.095 | - 0.256 *** |
| <i>Relative pay</i> | | 0.704 *** |
| <i>Superstar entry x relative pay</i> | | 0.152 *** |
| <i>All-NBA alumnus</i> | | |
| <i>Superstar entry x All-NBA alumnus</i> | | |
| | | |
| <i>Pos.: C</i> | - 0.481 *** | - 0.695 *** |
| <i>Pos.: PF</i> | - 0.094 *** | - 0.196 *** |
| <i>Pos.: SF</i> | 0.189 *** | 0.042 |
| <i>Pos.: SG</i> | 0.010 | - 0.035 |
| <i>Pos.: PG</i> | 2.142 *** | 2.072 *** |
| <i>Team tenure</i> | 0.003 *** | 0.002 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 1.468 *** | 2.046 *** |
| | | |
| <i>No. of observations</i> | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 5,058.07 | 7,006.00 |
| <i>R² (within)</i> | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.380 | 0.479 |
| <i>R² (overall)</i> | 0.232 | 0.284 |
| <i>Δ R² vs base model</i> | | 0.052 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-4: Results of Regression Analyses Testing Effects of *Relative Pay* on *Field Goals Missed*

| Variable | Base model | Model 1'': <i>Relative pay</i> |
|--|-------------------|---|
| <i>Superstar entry</i> | - 0.228 ** | 0.003 |
| <i>Relative pay</i> | | 1.503 *** |
| <i>Superstar entry x relative pay</i> | | - 0.203 ** |
| <i>All-NBA alumnus</i> | | |
| <i>Superstar entry x All-NBA alumnus</i> | | |
| <i>Pos.: C</i> | - 0.243 *** | - 0.450 *** |
| <i>Pos.: PF</i> | 0.281 *** | 0.143 *** |
| <i>Pos.: SF</i> | 0.848 *** | 0.563 *** |
| <i>Pos.: SG</i> | 0.709 *** | 0.602 *** |
| <i>Pos.: PG</i> | 0.818 *** | 0.596 *** |
| <i>Team tenure</i> | 0.006 *** | 0.002 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 4.247 *** | 5.085 *** |
| <i>No. of observations</i> | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 2,575.67 | 6,155.92 |
| <i>R² (within)</i> | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.200 | 0.451 |
| <i>R² (overall)</i> | 0.100 | 0.237 |
| <i>Δ R² vs base model</i> | | 0.137 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-5: Results of Regression Analyses Testing Effects of *Relative Pay* on *Field Goal Attempts*

| Variable | Base model | Model 1''': <i>Relative pay</i> |
|--|-------------------|--|
| <i>Superstar entry</i> | - 0.312 | 0.006 |
| <i>Relative pay</i> | | 2.831 *** |
| <i>Superstar entry x relative pay</i> | | - 0.293 * |
| <i>All-NBA alumnus</i> | | |
| <i>Superstar entry x All-NBA alumnus</i> | | |
| <i>Pos.: C</i> | - 0.064 | - 0.434 *** |
| <i>Pos.: PF</i> | 0.647 *** | 0.383 *** |
| <i>Pos.: SF</i> | 1.528 *** | 0.987 *** |
| <i>Pos.: SG</i> | 1.203 *** | 0.999 *** |
| <i>Pos.: PG</i> | 1.331 *** | 0.907 *** |
| <i>Team tenure</i> | 0.012 *** | 0.004 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.001 *** |
| <i>Constant</i> | 7.931 *** | 9.528 *** |
| <i>No. of observations</i> | 688,680 | 688,680 |
| <i>Gaussian Wald chi²</i> | 2,314.82 | 5,836.29 |
| <i>R² (within)</i> | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.194 | 0.453 |
| <i>R² (overall)</i> | 0.108 | 0.271 |
| <i>Δ R² vs base model</i> | | 0.163 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-6: Details on Effects of *Position Overlap* on Assists

| Variable | Base model | Model 3a': <i>No overlap</i> | Model 3b': <i>Limited overlap</i> | Model 3c': <i>Strong overlap</i> | Model 3d': <i>Full overlap</i> |
|--------------------------------------|-------------------|---|--|---|---|
| <i>Position overlap</i> | | | | | |
| None | | 0.207 ** | | | |
| Limited | | | - 0.494 *** | | |
| Strong | | | | 0.028 | |
| Full | | | | | 0.143 |
| <i>Pos.: C</i> | - 0.659 *** | - 0.593 *** | - 0.635 *** | - 0.661 *** | - 0.682 *** |
| <i>Pos.: PF</i> | - 0.175 * | - 0.123 | - 0.092 | - 0.178 * | - 0.172 * |
| <i>Pos.: SF</i> | 0.019 | 0.054 | 0.073 | 0.017 | 0.021 |
| <i>Pos.: SG</i> | - 0.185 | - 0.142 | - 0.095 | - 0.185 | - 0.189 |
| <i>Pos.: PG</i> | 1.942 *** | 1.957 *** | 1.978 *** | 1.944 *** | 1.935 *** |
| <i>Team tenure</i> | 0.003 *** | 0.003 *** | 0.003 *** | 0.003 *** | 0.003 *** |
| <i>Age (days)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>Constant</i> | 0.999 *** | 0.810 *** | 0.967 *** | 0.995 *** | 0.993 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 | 55,217 | 55,217 |
| <i>Wald chi²</i> | 425.95 | 428.44 | 433.31 | 426.48 | 427.83 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.385 | 0.387 | 0.393 | 0.385 | 0.385 |
| <i>R² (overall)</i> | 0.214 | 0.217 | 0.220 | 0.213 | 0.213 |
| <i>Δ R² vs base model</i> | | 0.003 | 0.006 | < 0.000 | < 0.000 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-7: Details on Effects of Position Overlap on Field Goals Missed

| Variable | Base model | Model 3a'': <i>No overlap</i> | Model 3b'': <i>Limited overlap</i> | Model 3c'': <i>Strong overlap</i> | Model 3d'': <i>Full overlap</i> |
|--------------------------------------|-------------|----------------------------------|---------------------------------------|--------------------------------------|------------------------------------|
| <i>Position overlap</i> | | | | | |
| None | | 0.396 *** | | | |
| Limited | | | - 0.566 *** | | |
| Strong | | | | - 0.267 * | |
| Full | | | | | 0.313 |
| <i>Pos.: C</i> | - 0.604 *** | - 0.479 ** | - 0.577 *** | - 0.576 *** | - 0.654 *** |
| <i>Pos.: PF</i> | 0.162 | 0.263 | 0.257 | 0.192 | 0.170 |
| <i>Pos.: SF</i> | 0.552 *** | 0.620 *** | 0.614 *** | 0.572 *** | 0.557 *** |
| <i>Pos.: SG</i> | 0.656 *** | 0.738 *** | 0.759 *** | 0.655 *** | 0.647 *** |
| <i>Pos.: PG</i> | 0.619 *** | 0.647 *** | 0.660 *** | 0.605 *** | 0.604 *** |
| <i>Team tenure</i> | 0.005 *** | 0.005 *** | 0.006 *** | 0.005 *** | 0.005 *** |
| <i>Age (days)</i> | - 0.000 * | - 0.000 * | - 0.000 * | - 0.000 * | - 0.000 * |
| <i>Constant</i> | 3.486 *** | 3.126 *** | 3.450 *** | 3.517 *** | 3.474 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 | 55,217 | 55,217 |
| <i>Wald chi²</i> | 237.53 | 238.22 | 240.00 | 237.52 | 239.95 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.210 | 0.216 | 0.217 | 0.212 | 0.212 |
| <i>R² (overall)</i> | 0.106 | 0.111 | 0.111 | 0.107 | 0.106 |
| <i>Δ R² vs base model</i> | | 0.005 | 0.005 | 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-8: Details on Effects of Position Overlap on Field Goal Attempts

| Variable | Base model | Model 3a''': <i>No overlap</i> | Model 3b''': <i>Limited overlap</i> | Model 3c''': <i>Strong overlap</i> | Model 3d''': <i>Full overlap</i> |
|--------------------------------------|------------|-----------------------------------|--|---------------------------------------|-------------------------------------|
| <i>Position overlap</i> | | | | | |
| None | | 0.794 *** | | | |
| Limited | | | - 1.010 *** | | |
| Strong | | | | - 0.506 | |
| Full | | | | | 0.373 |
| <i>Pos.: C</i> | - 0.707 * | - 0.458 | - 0.660 * | - 0.654 * | - 0.767 ** |
| <i>Pos.: PF</i> | 0.540 * | 0.741 ** | 0.709 ** | 0.596 * | 0.550 * |
| <i>Pos.: SF</i> | 0.978 *** | 1.112 *** | 1.089 *** | 1.015 *** | 0.984 *** |
| <i>Pos.: SG</i> | 1.182 *** | 1.347 *** | 1.367 *** | 1.181 *** | 1.172 *** |
| <i>Pos.: PG</i> | 1.153 *** | 1.207 *** | 1.225 *** | 1.127 *** | 1.135 *** |
| <i>Team tenure</i> | 0.011 *** | 0.011 *** | 0.011 *** | 0.011 *** | 0.011 *** |
| <i>Age (days)</i> | - 0.000 ** | - 0.000 ** | - 0.000 ** | - 0.000 ** | - 0.000 ** |
| <i>Constant</i> | 6.324 *** | 5.603 *** | 6.262 *** | 6.383 *** | 6.310 *** |
| <i>No. of observations</i> | 55,217 | 55,217 | 55,217 | 55,217 | 55,217 |
| <i>Wald chi²</i> | 197.23 | 198.03 | 199.23 | 197.44 | 199.23 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.194 | 0.201 | 0.200 | 0.196 | 0.195 |
| <i>R² (overall)</i> | 0.106 | 0.113 | 0.111 | 0.108 | 0.106 |
| <i>Δ R² vs base model</i> | | 0.007 | 0.005 | 0.002 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-9: Details on Effects of *Position Overlap* on *Shooting Precision*

| Variable | Base model | Model 3d''''': <i>Full overlap</i> |
|--------------------------------------|-------------------|---|
| <i>Full position overlap</i> | | - 0.018 ** |
| <i>Pos.: C</i> | 0.041 *** | 0.044 *** |
| <i>Pos.: PF</i> | 0.018 *** | 0.017 *** |
| <i>Pos.: SF</i> | - 0.012 ** | - 0.012 ** |
| <i>Pos.: SG</i> | - 0.003 | - 0.002 |
| <i>Pos.: PG</i> | - 0.010 * | - 0.009 |
| <i>Team tenure</i> | 0.000 *** | 0.000 *** |
| <i>Age (days)</i> | - 0.000 * | - 0.000 * |
| <i>Constant</i> | 0.439 *** | 0.440 *** |
| <i>No. of observations</i> | 55,217 | 55,217 |
| <i>Wald chi²</i> | 206.03 | 215.30 |
| <i>R² (within)</i> | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.104 | 0.105 |
| <i>R² (overall)</i> | 0.015 | 0.016 |
| <i>Δ R² vs base model</i> | | 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-10: Base Models for Regression Analyses Testing Effects of *Position Overlap* on *Effort*

| Variable | Base model (season) | Base model (30 days) | Base model (15 days) |
|--------------------------------------|--------------------------------|---------------------------------|---------------------------------|
| <i>Pos.: C</i> | 0.030 *** | 0.037 *** | 0.031 *** |
| <i>Pos.: PF</i> | 0.011 *** | 0.009 * | 0.010 * |
| <i>Pos.: SF</i> | - 0.014 *** | - 0.015 *** | - 0.014 *** |
| <i>Pos.: SG</i> | - 0.018 *** | - 0.017 *** | - 0.023 *** |
| <i>Pos.: PG</i> | - 0.029 *** | - 0.029 *** | - 0.030 *** |
| <i>Team tenure</i> | 0.000 *** | 0.000 | 0.000 |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 ** |
| <i>Constant</i> | 0.147 *** | 0.135 *** | 0.136 *** |
| <i>No. of observations</i> | 55,217 | 11,328 | 6,171 |
| <i>Gaussian Wald chi²</i> | 769.26 | 450.80 | 349.80 |
| <i>R² (within)</i> | 0.000 | 0.000 | 0.000 |
| <i>R² (between)</i> | 0.359 | 0.256 | 0.196 |
| <i>R² (overall)</i> | 0.081 | 0.092 | 0.086 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-11: Additional Variable Descriptions

| No. | Type | Variable | Obs. | Mean | SD | Min | Max |
|-----|---------|-------------------------|---------|-------|-------|-------|-------|
| 15 | Control | <i>Team average pay</i> | 646,956 | 2.907 | 1.616 | 0.243 | 7.434 |

Table A-12: Results of Alternative Regression Analyses Testing Effects of Pay Variation on Assists per Game

| Variable | Base Model: <i>Controls only</i> | Model 1a': <i>Pay range (lin.)</i> | Model 1b': <i>Pay range (squ.)</i> | Model 2': <i>Pay cap (squ.)</i> | Model 3': <i>Pay disp. (squ.)</i> |
|--------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|--------------------------------------|
| <i>Pay range</i> | | - 0.020 *** | - 0.121 *** | | |
| <i>Pay range</i> ² | | | 0.004 *** | | |
| <i>Pay cap</i> | | | | - 0.123 *** | |
| <i>Pay cap</i> ² | | | | 0.004 *** | |
| <i>Pay dispersion</i> | | | | | - 0.764 *** |
| <i>Pay dispersion</i> ² | | | | | 0.213 *** |
| <i>Team average pay</i> | - 0.186 *** | - 0.117 *** | - 0.017 ** | - 0.011 | - 0.166 *** |
| <i>Relative pay</i> | 0.517 *** | 0.519 *** | 0.530 *** | 0.530 *** | 0.521 *** |
| <i>Pos.: C</i> | - 1.471 *** | - 1.476 *** | - 1.471 *** | - 1.471 *** | - 1.476 *** |
| <i>Pos.: PF</i> | - 0.358 *** | - 0.360 *** | - 0.350 *** | - 0.350 *** | - 0.358 *** |
| <i>Pos.: SF</i> | - 0.140 *** | - 0.142 *** | - 0.134 *** | - 0.134 *** | - 0.142 *** |
| <i>Pos.: SG</i> | - 0.313 *** | - 0.315 *** | - 0.301 *** | - 0.300 *** | - 0.314 *** |
| <i>Pos.: PG</i> | 3.996 *** | 3.993 *** | 4.003 *** | 4.003 *** | 3.995 *** |
| <i>Team tenure</i> | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** | 0.001 *** |
| <i>Age (days)</i> | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** | - 0.000 *** |
| <i>Constant</i> | 3.867 *** | 3.844 *** | 4.089 *** | 4.107 *** | 4.310 *** |
| <i>No. of observations</i> | 646,956 | 646,956 | 646,956 | 646,956 | 646,956 |
| <i>F</i> | 18,850.75 | 16,981.97 | 15,526.61 | 15,529.92 | 15,444.06 |
| <i>Adjusted R²</i> | 0.208 | 0.208 | 0.209 | 0.209 | 0.208 |
| <i>Δ R² vs base model</i> | | < 0.001 | 0.001 | 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix

Appendix A: Additional Analyses

Table A-13: Results of Alternative Regression Analyses Testing Effects of Pay Variation on Efficiency per Game

| Variable | Base Model: Controls only | Model 4a': Pay range (lin.) | Model 4b': Pay range (squ.) | Model 5': Pay cap (squ.) | Model 6': Pay disp. (squ.) |
|--------------------------------------|------------------------------|--------------------------------|--------------------------------|-----------------------------|-------------------------------|
| <i>Pay range</i> | | - 0.058 *** | - 0.446 *** | | |
| <i>Pay range</i> ² | | | 0.014 *** | | |
| <i>Pay cap</i> | | | | - 0.462 *** | |
| <i>Pay cap</i> ² | | | | 0.014 *** | |
| <i>Pay dispersion</i> | | | | | 0.266 |
| <i>Pay dispersion</i> ² | | | | | - 0.545 * |
| <i>Team average pay</i> | - 0.304 *** | - 0.102 *** | 0.284 *** | 0.311 *** | - 0.261 *** |
| <i>Relative pay</i> | 2.519 *** | 2.525 *** | 2.569 *** | 2.571 *** | 2.529 *** |
| <i>Pos.: C</i> | 1.297 *** | 1.282 *** | 1.300 *** | 1.300 *** | 1.283 *** |
| <i>Pos.: PF</i> | 1.242 *** | 1.235 *** | 1.275 *** | 1.277 *** | 1.237 *** |
| <i>Pos.: SF</i> | - 0.868 *** | - 0.874 *** | - 0.842 *** | - 0.841 *** | - 0.870 *** |
| <i>Pos.: SG</i> | - 1.043 *** | - 1.049 *** | - 0.994 *** | - 0.991 *** | - 1.049 *** |
| <i>Pos.: PG</i> | 0.157 * | 0.148 * | 0.187 ** | 0.187 ** | 0.152 * |
| <i>Team tenure</i> | 0.007 *** | 0.007 *** | 0.007 *** | 0.007 *** | 0.007 *** |
| <i>Age (days)</i> | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** | - 0.001 *** |
| <i>Constant</i> | 24.170 *** | 24.103 *** | 25.044 *** | 25.133 *** | 24.241 *** |
| <i>No. of observations</i> | 646,956 | 646,956 | 646,956 | 646,956 | 646,956 |
| <i>F</i> | 2,159.63 | 1,948.60 | 1,817.51 | 1,821.13 | 1,773.01 |
| <i>Adjusted R²</i> | 0.029 | 0.029 | 0.030 | 0.030 | 0.029 |
| <i>Δ R² vs base model</i> | | < 0.001 | 0.001 | 0.001 | < 0.001 |

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Appendix B: Exemplary Experimental Setup

This section outlines the concept for an experiment targeted at examining the effects of a superstar joining a team based on each team member's position in the social hierarchy²¹. As such, it may serve as an approach to providing further empirical evidence for my findings concerning H1 and H1_{alt} that were defined in Paper I (cf. chapter 2.3.1) as suggested in the overall conclusion to this dissertation (cf. chapter 5.2). I will limit myself to the overall concept of the experiment without elaborating on the methodical and procedural details, as my primary objective is to provide the reader with a general impression of how I believe such an experiment may contribute to a better understanding of disruptions in social hierarchies.

Research Question and Hypotheses

As described above, the experiment picks up the research question addressed by Paper I, which is:

Question I: How does an exogenous shock to a team's social hierarchy – the addition of a superstar – affect individual cooperation and performance?

Unlike Paper I, however, it will zero in on cooperation alone, leaving the performance aspect aside. As a consequence, the experiment specifically aims at empirically examining H1 and H1_{alt}:

HYPOTHESIS 1 (H1). *The higher an individual's status, the more negatively his cooperation will be affected by a superstar joining the team.*

²¹I originally developed the idea for this experiment in the course of the research seminar 'Laboratory, Field, and Natural Experiments' by Jun.-Prof. Dr. Dominic Schreyer at WHU – Otto Beisheim School of Management from December 14 to December 16, 2015. In this section, an extended description of this experiment is provided.

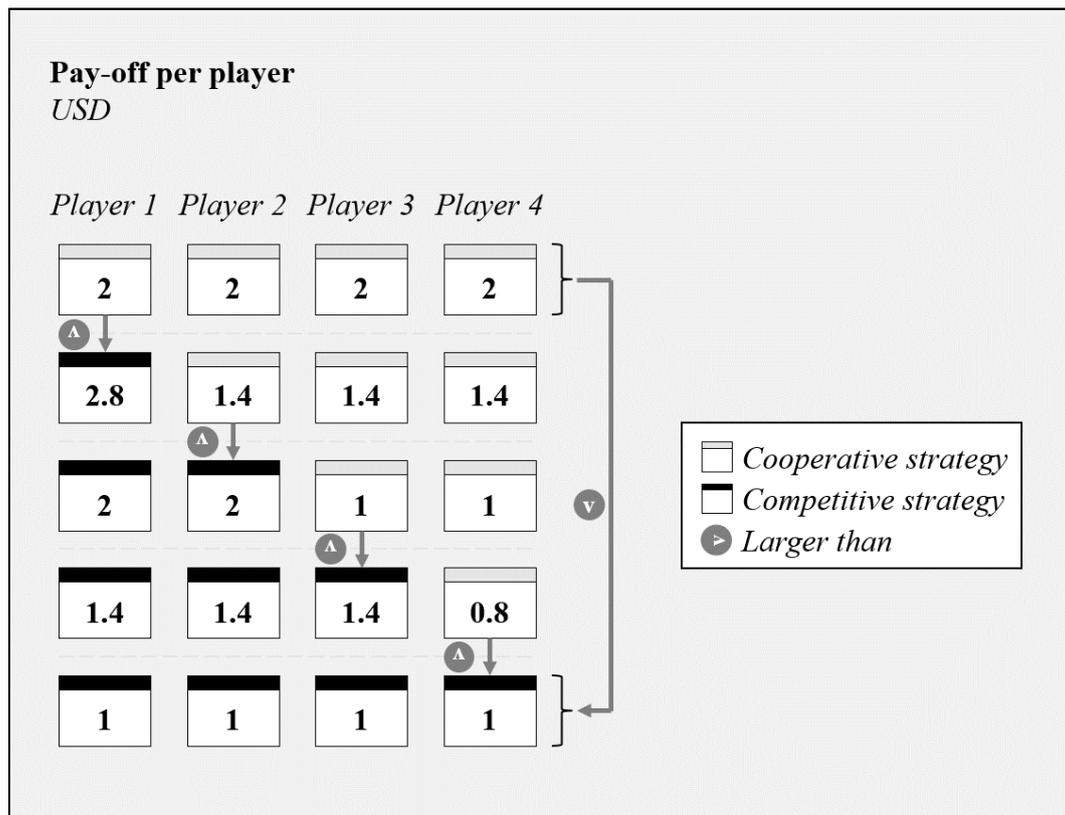
HYPOTHESIS 1_{ALT} (H1_{ALT}). *The higher an individual's status, the more positively his cooperation will be affected by a superstar joining the team.*

Experiment Description

Individual Game. At the heart of the experiment is an iterated, computer-based Prisoner's Dilemma-style game that four participants, e.g. university students, play at a time in separate rooms. In each round of the game, the four-player team can jointly win a maximum total amount of USD 8.-. The amount that the players win is determined by the strategy each player uses in each of the rounds, which can be either *cooperative* or *competitive*. If all players choose the *cooperative* strategy, the USD 8.- are equally distributed among all four players as described in the first line in Figure A-1. Each player choosing the *competitive* strategy receives twice the amount of money that players choosing the *cooperative* strategy receive. However, the overall amount available to all players is reduced by USD 1.- for each player choosing the *competitive* strategy in a given round. As a consequence, the *competitive* strategy is dominant over the *cooperative* strategy: no matter what the other players choose to do, each player can only increase his individual pay-off by choosing the *competitive* over the *cooperative* strategy. Collectively, however, all players will be worse off. What is more, if more than one player chooses the *competitive* strategy, none of the four players will be better off than if they all had chosen the *cooperative* strategy.

Prior to choosing the strategy, the players are allowed to communicate the strategy they plan to apply in the next round to the other players by means of two buttons. They may use a strategy different from the one they announce, but they may not exchange any information other than the strategy they intend to choose in the next round. Once all players have chosen their respective strategies, they are shown the results of the game – including each player's strategy and the distribution of the rewards – on the screen.

Figure A-1: Pay-Off per Player as a Function of Each Player's Choice of Strategy



In sum, each player must decide in each round whether to egoistically pursue personal gain at the expense of the team or forgo it for the sake of greater collective pay-off. I argue that this set-up is representative for a wide array of real-life interdependent team situations, which according to Deutsch (1949) are hardly ever purely cooperative or purely competitive, but rather contain a complex set of both cooperative and competitive objectives. “Thus, for example, the members of a basketball team may be co-operatively interrelated with respect to winning the game, but competitively interrelated with respect to being the ‘star’ of the team” (p. 132). As a result, the game described above may be considered a simplified, but appropriate representation of cooperation decisions that individuals in teams are faced with on a regular basis.

Overall Experiment. Before the participants begin playing the game, each of them may be asked to complete a survey in order to collect personality-related data that were unavailable in my

previous analyses given the research setting used in this dissertation. These data may include, for example, an individual's regulatory focus on either promotion or prevention, which has been found to affect status attainment in groups (Kilduff and Galinsky 2013). Upon completion of the survey, players are randomly assigned into teams of four, given an introduction to the rules of the game and then taken to separate rooms to prevent any form of communication between them other than their announcing their strategies through the software tool.

The four-member teams will then be randomly assigned to the treatment or to one of two control groups. Each of the three groups will play two sets of five games each with a break between the two sets. After the first set of five games, the players' screens will summarize the exact amounts received by each member. What is more, as exemplified in Figure A-2, it will specifically and visibly honor the most successful player up to that point as a means to establish a status hierarchy with the winner of the first set at the top.

Figure A-2: Exemplary Display of Standings after First Set

| Player 3 won the first set! | | | |
|------------------------------------|--------------------|-----------------|---------------------------|
| | Sets played | Sets won | Money earned (USD) |
| Player 1 | 1 | 0 | 7.60 |
| Player 2 | 1 | 0 | 7.20 |
| Player 3 | 1 | 1 | 9.60 |
| Player 4 | 1 | 0 | 8.00 |

The treatment that distinguishes the focal group from the two control groups will be the information the players are provided at the end of the break between the two sets: Three of the four players, including the leading player after the first set, will be informed that the fourth player had to leave on short notice and will be replaced by an experienced substitute, who

represents the ‘superstar’ with a proven track record of dominating the game in this experimental setting. This piece of information will be complemented with an update of the results screen that emphasizes the allegedly new player’s previous success, as exemplarily displayed in Figure A-3. In reality, however, the fourth player stays in the game and does not receive any information whatsoever concerning a change in the composition of the team. After the announcement, the second set is played.

Figure A-3: Exemplary Display of Standings before Start of Second Set (Treatment Group)

| | Sets played | Sets won | Money earned (USD) |
|-----------------|--------------------|-----------------|---------------------------|
| Player 1 | 1 | 0 | 7.60 |
| Player 2 | 8 | 5 | 78.20 |
| Player 3 | 1 | 1 | 9.60 |
| Player 4 | 1 | 0 | 8.00 |

As regards the two control groups, one of them does not receive any announcement of a change in team composition whatsoever, while the other is told that one of the players is replaced by an equally unexperienced, neither over- nor underperforming individual. This double control group ensures that potential changes in the tendency to cooperate in the treatment group can be unambiguously attributed to the superstar joining the team rather than to a random change in team composition. It is important to note, however, that none of the teams in any of the three groups is actually reconstituted – the only difference among the treatment group and the two control groups is whether or not an announcement concerning a change in team composition is made and whether this change consists in a superstar or a non-superstar individual joining the team.

Variables and Measurement. Two primary independent variables – *superstar entry* and *member status* – as well as one primary dependent variable – *cooperation* – need to be defined for the experiment to provide evidence regarding the hypotheses. These may be complemented by further variables, e.g. based on personality-related survey data, in order to broaden the set of hypotheses that can be tested based on the experiment.

Superstar entry may be defined as a nominal variable that differentiates the three groups by the treatment they receive, i.e. whether an alleged superstar joined the team or whether an average performer joined the team or whether there was no announcement of a change to the team's composition whatsoever.

Member status can be defined based on the outcome of the first set either as an ordinal dichotomous variable – whether or not a given player has won the first set – or as a continuous variable based on the money received in the first set. As signals of quality and competence contribute to defining a collective's social hierarchy (Piazza and Castellucci 2014, Anderson and Kilduff 2009a) and as no other comparable signals are available to the players who all play the game in separate rooms, I argue that the vivid display of the results of the first set and its emphasis on the winner's performance will be sufficient to establish players' initial status positions.

A range of variables can be used to assess *cooperation* based on both players' choices of strategies and the tendency to – truthfully – communicate these strategies in advance. These may include: (a) the number of rounds in which a player uses the cooperative strategy in the second set; (b) the number of times a player communicates his strategy prior to applying it; and (c) a player's tendency to truthfully announce a strategy as described by the ratio of truthfully announced strategies divided by all strategy announcements. All of these variables can either be measured in absolute terms for the second set or defined as ratios between the second and

Appendix

Appendix B: Exemplary Experimental Setup

first sets to zero in on changes in each individual's cooperation behavior between the two sets. These measures will provide insight into three behavioral patterns associated with *cooperation*, namely (a) whether or not a player is willing to forgo individual benefits for the sake of greater collective pay-offs, (b) whether or not a player is willing to share information and, in doing so, show commitment to the team, or (c) whether or a player can be trusted to stand by his word rather than trying to deceive his teammates.

Taking everything into consideration, controlled laboratory experiments like the one described above may contribute significantly to further increasing our understanding of how status dynamics affect individual behaviors in teams.