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Aims and theoretical perspectives

"The premise of this work has been that the wide range of behaviors with which an individual encounters reality may be encompassed by relatively few dimensions of organization. Presumably, these dimensions concerns modes of coping with particular ~~situat~~ situational frameworks of task, stimulus-constraints, and intentions for which the modes are especially relevant and suited. They manifest themselves through perceptual, recollective, and other functions. To emphasize their orientation toward reality and environmental structures, we have thought of such organizing tendencies as adaptive controls, and of their behavioral consequences as adaptive solutions" (1).

"Our studies have demonstrated that people differ in the emphasis they give to one or another of the configurational qualities of objects, e.g., figure-ground differentials, contour formation, etc...It has seemed to us important to consider that differences of this kind in perceptual organization may also constitute structural restraints on the effects of drives. In psychoanalytic terms, such structural components of perception may determine the extent to which primary-process determinants will dominate thinking" (2).

"Individual differences in cognitive behavior have been variously interpreted by personality theorists. Some have seen in such differences evidence of 'distortion' or 'autism' produced by drives, needs, wishes, and conflicts. Taking some single standard of accuracy or effectiveness, these investigators have tended to regard deviations as indicative of projective influences on thought. The present study and its precursors were guided by the possibility that such variations among people arise from a different source. It did not seem to us that wishes pressing to override reality are a major factor in producing such differences....it seemed to us that differences among people could simply reflect different adaptive approaches to reality, all effective (if not equally accurate) as ways of coping with reality. 'Effective perception does not mean uniform perception among people; conversely, individual differences in perception do not necessary imply 'distorting' mechanisms'... ..the present research is closely linked to a fundamental premise of psychoanalytic theory: the organism must not only bring needs, impulses, and wishes into continual harmony; it must also resolve the many independent claims of reality. A person is always in a state of ~~maximal~~ motivation, i.e., never without purpose. But while much of his behavior is concerned with reaching satisfying and desirable objects or states, his attempts at need satisfaction are molded by an even more central requirement of survival: that of allaying his strivings without sacrificing effective adaptation to external conditions....In our view, a cognitive control describes an organizational tendency that relates the functioning of these structures to each other within the person. It is an intervening structural condition accounting in part for the particular impact of a need of cognition" (3-4).

The behavioral units in cognitive controls and cognitive styles: "Cognitive controls are conceived of as slow-changing, developmentally stabilized structures: (a) they are relatively invariant over a given class of situations and intentions; (b) they are operative despite shifts in situational and behavioral contexts typical of cognitive activity from moment to moment. Cognitive controls refer to a level of organization that is more general than the specific structural components underlying perception, recall, and judgement....Since a number of cognitive controls are assumed to coexist within a personality, the possibility arises that the composition of controls within a person may itself have consequences for behavior that cannot be deduced from individual controls alone....We have referred to such arrangements of controls as cognitive styles. The importance of style is that it may provide a basis for predicting behaviors that cannot be inferred from the characteristics of individual controls" (5-6).

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Systemic conceptions of personality: "At the heart of the present study...lies an assumption fundamental to any personality theory: that the objective of a theory of behavior is to discover the most general regulatory principles that determine a person's responses and account for individual differences among people....a systemic conception of personality assumes not only that the organism is well stocked with purposes, directional tendencies or motives, and instrumental means (percepts, motor responses), but that these are arranged in a hierarchical organization of structures, function linked to function....Only the skimpiest theory exists as to how the processes in the organism partake of such an order, and in what forms, and what the most efficient model would be for envisioning a total system of regulation and control. In general, a systemic theory must address itself to (a) considerations of structural manifolds; (b) order and disorder within and between these manifolds; (c) relative dependence and independence of subsystems; (d) constraints within and between subsystems; (e) a conception of a hierarchy of constraints within the system, ranging from lower-order to higher-order ones; (f) the problem of the relative autonomy of lower-order and higher-order sub-systems; (g) the problem of the relationship of lower systems to higher systems, e.g., the manner in which the lower subsystems may become implicated in the workings of the higher-order structures... ..In the personality, organizational characteristics of superordinate structures are imposed upon the lower-order systems (e.g., specific perceptual and cognitive processes) and become manifest in the achievements of these processes. In this sense the latter serve as mediating subsystems; the higher-order structures serve as leasing systems. The organizational coherence of the lower-order systems assures them a certain measure of autonomy from the superordinate structures....The relative autonomy of lower-order systems limits the influence of cognitive controls on response" (6-8).

Relationship to psychoanalytic theory:

(a) Relationship to psychophysical coordination: "Hartmann has emphasized that an adaptation involves not only means of conflict resolution (e.g., defense), but also processes pertaining to a relatively 'conflict-free' sphere of ego functioning....Hartmann conceives of adaptive events (e.g., object comprehension; thinking; language; perceptual and recall phenomena; motor development, including grasping, crawling, and walking) and of the maturational and learning processes implicit in all of these activities as indicating the presence from the first of an ensemble of functions that exert their effects outside the region of mental conflicts. Though they are closely linked to drive development (as mediating structures), the relative autonomy of the conflict-free functions is assured by characteristics which make them especially suited to represent and deal with environmental forces. Cognitive controls refer to precisely those processes which Hartmann has termed conflict-free. Specifically, they describe the characteristic ways in which reality-adaptive events have become organized in the person; each constitutes for the person his optimal adaptational level in the particular class of environmental situations to which it is suited. To say that controls are adaptive does not mean that they provide an accurate translation of reality; it means that they provide a 'workable fit.' The most accurate grasp of reality is not necessarily the most effective one" (9-10).

(b) Relationship to drive: "Needs are subject to modulation and enforced postponement. Defenses are, of course, especially prominent means of effecting such delay, but it must be emphasized that psychoanalysis does not assume that delay is exclusively accomplished by defense. In psychoanalytic theory, all structures are conceived of as having a delaying function. Since cognitive controls have an organizing influence on behavior, they must also be assumed to have a hand in delaying need discharge...the action of cognitive controls under special conditions is not essentially different from their established function in ordinary encounters with reality. It is not that of defense, in one sense in which defense is sometimes meant as a special characteristic of response to conflict and anxiety" (11-12).

(c) Relationship to defense: "As control structures, cognitive controls do, however, serve a function similar to defenses, and it would not surprise us if similar



structures were involved in both....To summarize: (a) both cognitive controls and defenses are considered to be structures; (b) they provide instrumental means through which drive discharge takes place; (c) the modulate drive-discharge processes to accord with established modes of confronting the reality context in which consummation is sought" (12).

(d) Relationship to development: "Psychoanalytic theory assumes that drives and controls develop from a common matrix of structures and processes. In the course of development and through repeated environmental encounters, enforced delays of gratification are internalized as controls...." (12-13).

(e) Some process considerations: "Since the influence of cognitive controls is very much a matter of highlighting certain environmental features and reducing the effectiveness of others, it is precisely in the regulation of attention that the influence of cognitive controls may be most apparent. In speaking of attention, we are referring to Freud's conception of a fixed quantity of hypercathexis that may be ~~developed~~ deployed or mobilized in a variety of patterns. Presumably, a critical quantity of such cathexis must be attracted by an idea or stimulus for it to become part of the field of consciousness. The availability of attention hypercathexis and its patterning are presumably vital matters in the development and maintenance of cognitive structures...The concept of attention hypercathexis focuses upon the conditions of competition for this fixed supply. It is possible to account in part for some of the properties of several cognitive controls in these terms. For instance, the control principle we call scanning implies a distinctive patterning of attention. Extensive scanning reflects deployment of attention hypercathexis over widespread segments of a stimulus field. In field-articulation, we have a pattern of attention deployment in which attention hypercathexes are mobilized upon the most relevant segments of an informational array. The level-sharpening control principle raises the problem of attention availability" (13-14).

Some considerations of measurement: "It is necessary to be clear about what is meant by the generality of a cognitive control. The generality refers to the range of situations which pose similar adaptive requirements and similar situational characteristics. It does not refer simply to the physical characteristics of stimuli nor to identities of behavior....the control-principle conception avoids the traditional pitfalls of typologies which define personality consistency solely in terms of response characteristics. In focusing upon antecedent conditions of situational contexts, we increase the possibility of operational control in predicting behavior from control principles. The very same stimulus situation can become a very different adaptive task when the instructions are changed, thereby precluding the operation of certain control principles....In general, our means of specifying control principles utilizes different tests as if they were 'items' of a questionnaire. By massing 'items,' i.e., different test situations, and looking for relationships among them, we hope that a control principle will stand out in relief. By working with an expanding circle of experimentally defined phenomena it is therefore possible to include a wider range of behaviors and situations that are unified by a single organizational principle and to sharpen our understanding of the principle. Inferences about the control principles can then be drawn which allow prediction ~~of~~ to congruent behaviors in different regions of the personality" (15-16).

Design of the present study: "Five previously defined controls, conceived of as dimensions form the core of the present study: leveling-sharpening...focusing or sharpening....constricted-flexible control....equivalence range....and tolerance ~~XXXXXXXXXXXX~~ for unrealistic experiences....Also represented in the study is Witkin's field dependence-independence dimension.... An important aim..was to bring the different control principles under tighter operational rein in order to clarify still more the tasks and adaptive intentions to which they are specifically linked... Our tool for investigating commonalities of test situations with respect to the control principles is factor analysis. It is employed here simply as a quantitative tool... Our interpretations of these commonalities are guided solely by assumptions concerning the adaptive significance of the factors in individual behavior" (16-17).

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Plan of the Study

The five control principle were measured by 14 experimental tasks. In addition, the Rorschach test was included, as well as a personal inventory of 234 items. Subjects were paid \$10 for participating, but they were volunteers self-selected for persistence and interest in this type of work. There were 60 Ss, 30 of each sex. All Ss were of middle-class background. Ages ranged from 17 to 39. Average age for women was 27.4, for men 23.7. 12 of the 30 men were married, as were 21 of the 30 women. Ss spanned a variety of occupations and differed widely in education, the majority had at least some college education. The general level of correlations between scores and patterning of correlations were quite different for men and women, thus separate factor analyses were done for each sex. From a total of 40 measures, 33 were selected and factored. Five factors were extracted for men and three for women.

The Leveling-Sharpening Control Principle

Previous studies "...were designed to show a general leveling-sharpening tendency in a variety of modalities. Leveling was first defined as a low degree of articulation of stimulus fields. Such a tendency might manifest itself in: (a) difficulty in extracting figures embedded in larger contexts; (b) easy assimilation of new stimuli into dominant organizations, so that a gradual change in the stimulus field would go unrecognized for a relatively long period. In general, leveling was used to mean maximal dedifferentiation of the cognitive field; and sharpening to mean to opposite, i.e., maximal complexity and differentiation of the field. Thus a leveler should have difficulty in extracting figures from ground, whereas a sharpener should not" (22). Results were always in the predicted direction in previous studies, but were never significant statistically. Two tests used in this study: The Schematizing Test. This requires judgements of a series of 150 squares which gradually increase in size. There are 14 sizes of squares, ranging from 1.2 to 13.7 inches on a side. They were projected individually onto a screen, each for five seconds, for subjects. SS were tested in groups of five each. Ss were asked to write the estimation of the size of each square in the appropriately numbered space in a test booklet. Two aspects of the Ss response must be distinguished: his discriminative sensitivity (his perception), and his means of reporting, i.e., the kind of yardstick he uses, his preference for certain scaling units rather than others. It is possible for two subjects of equal sensitivity to use different scaling units. The degree to which the subject keeps pace with progressive increase in size is a major aspect of his performance on this test. "Failure to reproduce the progressive increase in size can also be understood as an assimilation effect... That is, lagging behind the trend of increase in size may result from assimilation between the perceptual representing new squares and the trace aggregate representing the smaller squares seen previously. This interpretation is supported by the fact that gross deviations from the trend of increase usually take the form of extreme underestimation. The leveler, then, may be the subject who is characterized by large assimilation effects. The second major facet of response... is the accuracy with which the subject ranks the sizes of the successive stimuli. Low accuracy may mean either that the subject is not able to discriminate small stimulus differences, or that he has no consistently stable conception of the previous stimuli, and hence cannot assign the new stimuli to correct positions in the series. Low ranking accuracy may also stem from relatively unstimulated spotky attention, which results in inexact registration of individual squares... Ranking accuracy can also be conceived of in terms of assimilation effects. Maximal assimilation between between processes representing new squares and memory traces of preceding squares should lead to low accuracy." (25026). Three separate scores were developed from the preceding rationale: "① Ranking accuracy: this score was obtained by dividing the number of stimuli correctly ranked by the maximum number (150)... ② Increment error (regression). This score compared with the estimates of size increase with the actual rate of increase. ③ Increment ~~error~~ error. This score was the raw mean increment error value" (26).

The other test used in level-sharpening was the Kinesthetic Time Error Test. However, ~~time~~ time does not seem to be a factor in ~~any~~ determining this test score. In this test, S judges the weight of a comparison stimulus in relation to that



of a standard. In two of the three conditions used, the comparison is made more difficult by the interpolation of a third weight which is much lighter or heavier than the standard or comparison stimuli. In the instructions, the S is encouraged to be as accurate as possible in judging the relative weights of the standard and the comparison stimuli. He was told to try to ignore the middle, interpolated weight. In one condition, no interpolated weight was used. Ss had to say whether the third weight was lighter or heavier than the first. Two scores obtained from this procedure were (4) Assimilation. This score was the difference in time error between Conditions II (heavy interpolated weight) and I (light interpolated weight.. (5) Time error. This score was the algebraic sum of the subject's time errors for the three conditions" (30). Scores are numbered consecutively through the book, thus scores for this section are not numbered 1 and 2, but continue from previous scores noted of 1, 2, 3. Forty scores in all are obtained. Although scores here relate to "time errors", time ~~error~~ does not seem to be a factor in computing the score.

The Control Principle of Tolerance for Unrealistic Experiences

A control principle related to tolerance for unrealistic experiences was proposed in an earlier experiment in which range of apparent movement was successfully predicted from Rorschach ratings. "Tolerance for instability (here called tolerance for unrealistic experiences) was defined as acceptance of experiences which do not agree with what one knows to be true. Tolerant subjects were assumed to take their experience at face value and to have relatively little need to mold it in terms of 'usual' or 'expected' reality. Intolerance for instability was defined as resistance to perceptual or cognitive experience in which ideational or immediate sense data controvert conventional reality" (31). Results from various experiments suggest that tolerance for unrealistic experiences may apply to widely disparate tasks, involving perception, memory, and concept formation, including response to ambiguous stimuli such as found on the Rorschach. Two test used to measure this control principle in this experiment.

1. Apparent movement test. ~~Stochastik~~ The apparatus was a tachistoscope modified to provide three field. In each of two field was a horse with feet astride, in the third was a blank white cardboard. Before the test, the operation of the apparatus was explained to the S, he was shown the two separate stimulus cards, and was told that, although he might later see movement, as each card was flashed at certain speeds, no actual movement would be occurring. Pretest trials were given. Then, there were three tests trials. The rate of card presentation, from one to the other was increased until the S reported his experience changed from that of one figure succeeding another to that of a single figure moving back and forth. After this point, the experimenter continued to increase the speed until the S reported his experience changed to that of two figures flashing on and off simultaneously. The difference between the two alternation rates was the basic score. In this test, "Ss showed notable difference (a) in the alternation rates at which they first perceived 'motion', and (b) in the range of alternational rates over which 'motion' persists. This situation can be made 'unrealistic' if the experience of movement occurs in a context of conflicting information. If the subject understands that he is actually seeing two stationary figures appearing alternately, he is confronted with an issue of 'tolerance.'.....The range of apparent movement is a complicated datum. The first experience of apparent movement (the lower threshold) and the experience of flicker (the upper threshold) are rather strikingly different. In general, subjects are confident in the transition from alternation to movement. In contrast, the transition zone between apparent movement and flicker is much more unstable; either 'movement' or flicker can be experienced, and subjects express much more doubt about judgments of this upper threshold." (33-34). Scores selected were: (6) Mean movement threshold. ...consisted of the mean alternation rate, in cycles per second, at which the subject first reported a shift in his experience from that of two horses to that of one horse moving back and forth." Mean was based on scores over three test trials. (7) Mean range. This score consisted of the mean interval, in cycles per second, between the alternation rates at which the subject first reported the experience of one horse moving back and forth and the higher alternation rate at



which he experienced two horses flickering simultaneously." (35).

2. Aniseikonic lenses test. These are lenses that alters in specific ways the size and shape, but not the focus, of images transmitted through them. Ss closed his eyes and the glasses were put on. He was told that when he would open his eyes, he would see the wall and floor of the room as he did before he closed his eyes. He was told that some people find that things look different, and others find no difference at all. He was asked to describe what he saw as he looked around the room. There are sharp individual differences in the speed with which Ss recognize distortion "which seems to be an appropriate measure of tolerance for unrealistic experiences." Some Ss experience ^{over} effects immediately after putting on glasses; others do not report distortion after wearing the glasses for five minutes. "It seems possible for a subject to facilitate the experience of distortion by focusing on distortion-prone objects... ~~to focus on~~. Thus, recognition of distortion depends in part on where the subject chooses to focus attention." (37-38). Ss also had to adjust a bar, while wearing these glasses, until it is vertical. Here, motor response replaces verbal response. Two scores derived from these tests: "6) Log recognition time. This score was the logarithm of the time in second required to report the recognition of tilt in Condition I". In condition II, the lens were reversed, so the effects were reversed. "9) Mean deviation. This score was the mean difference (in degrees) between the subject's adjustment of the rod and the true vertical. Only Condition I was used..." (38).

The Equivalence Range Control Principle

In a previous study, it was found that Ss who sorted objects spontaneously "into many groups (narrow equivalence range)" made more accurate retinal and object matches in two size-constancy situations, were better able to match shapes in a shape-constancy test and to equate brightness of two light patches. A narrow equivalence range seemed to imply detailed categorization of certain aspects of experience. 'Narrow-range' subjects had relatively exact standards for judging similarity. 'Broad-range' subjects on the other hand, were less finicky about fine stimulus differences, and grouped stimuli into broader categories" (39).

Two tests used in obtaining measures of this control principle. 1. Object sorting test. Ss were presented with 73 objects of varying familiarity. They were told there was no one answer to this test, that they were to place together in groups the objects which seemed to go together. Ss were told they could make as few or as many groups as they wishes. Each S was tested individually. This test is permissive so as to encourage spontaneous categorizing behavior. Each S is put on his own. Score derived from this: "10) Number of groups. This score is the number of groups each subject formed from the 73 objects" (42). The second test used was: Size Constancy Test. ~~SIXTYTHREE THROUGH SEVENTYTHREE~~ S was trained to recognize the difference between real and apparent size. Then, he was presented stimuli, which is compared with a standard stimulus. He was told to indicate whether each comparison stimulus was larger, smaller, or the same in apparent size as the standard stimulus which was further away from him at the end of a table. "Subjects ~~are~~ usually are in conflict between two tendencies: (a) the overlearned response to actual object size; and (b) the experimental demand to respond in terms of retinal size" (44). Scores derived were: "11) Mean diameter.. This score indicates the accuracy of the S's matching of comparison with standard in terms of apparent size... 12) Improvement. This score indicates change in matching accuracy from the ascending to the descending trial... 13) Area of uncertainty. This measure is based on the notion that fluctuation in judgements may represent equivalence range. It consists of the average number of judgements ~~intervening~~ between an unbroken ~~series of judgements~~ series of 'smaller' and 'larger' judgements in the two trials..." (44-45).

The Focusing Control Principle

The original formulation of this principle was derived in part from Freud's observation that "...the defense of isolation separates an idea from other ideas in consciousness, and from its emotional attributes. In addition... that 'concentration is utilized

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to keep at a distance not ~~at~~ solely matters of indifference, things that are irrelevant, but in particular things that seem inconveniently counter to the matter at hand.' " (46). Two aspects: a tendency to narrow awareness and to keep experiences discrete, and a tendency to separate affect from idea. The first aspect was presumed to be measured by a size-estimation test in which Ss were required to cope with distractions or irrelevancies that could interfere with accurate performance. Extreme focusers were expected to be highly accurate in estimating the size of disks containing distracting cues, i.e., to narrow attention to the relevant datum....The second aspect of focusing--separation of idea from affect--was approached through a Picture Sorting Test consisting of sexual, aggressive, and neutral pictures. It was assumed that focusers would not commit themselves to clear-cut affective experience and would therefore sort relatively many pictures into an 'Indifferent' category. In the size estimation test used here, S~~x~~ turned a crank handle until a circle of light that he was looking at was thought to be equal to various sized disks he was given. "Accuracy in this kind of size estimation may be a function of the degree of attention deployment. Practically all subjects' errors take the form of overestimation, and one basis of overestimation in such situations could be an imbalance in relative concentration, i.e., looking longer at the standard stimuli than at the comparison stimulus, or looking for relatively long periods at the standard stimuli than in individual concentrations....: (49). Scores derived from this test were: (14) Average error...which was the average error in 12 judgments of the three disks. (15) Heaviness effect...represents the increase in apparent size resulting from the heaviness of one of the disks. In the picture sorting test, the S was presented with a stack of cards on which there were pictures and was told to sort them into three piles, like, dislike, and indifferent. "The original hypothesis for the Picture Sorting Test was that people who avoid or circumvent experiences of affect should sort relatively many pictures into an Indifferent category. When the test is examined more closely, however several other possibilities emerge. Some subjects may not wish to express feelings....other subjects may be slow to react to the card and place it in the Indifferent category because they have no feeling at the moment....some subjects may place pictures in the Indifferent category simply because it is provided." (51-52). Score derived from this test: (16) Number indifferent...the number of pictures placed in the indifferent category.

The Constricted-Flexible Control Principle

The terms 'constricted control' and 'flexible control' were first used by Klein (1954) to describe differing reactions to stimulus field containing contradictory or intrusive cues. The criterion task was a Color-Word Test in which Ss were required to read the color of a word and ignore its content. "Constricted-control subjects resorted to counteractive measures in their attempts to overcome the disruptive effect of intrusive cues. When possible, their responses were guided by the most central or obvious aspect of a field, i.e., they coped with distracting stimuli by ignoring them in favor of a salient, easily confirmable stimulus attribute. When external cues seemed to contradict internal cues, the conflict was resolved in favor of the most obvious external ones. These subjects tended to avoid using feelings or emotional reactions as a source of information. ..also seemed resistive to change, preferring to maintain sets long after they were appropriate...Flexible-control subjects seemed relatively comfortable in situations that involved contradictory or intrusive cues. They were not overimpressed with a dominant stimulus organization if the instructions rendered another part of the field more appropriate. Thus, they were capable of differential response to specified aspects of a field in the face of explicitly interfering cues." (53).

There were several tests used to measure this control principle. The first was the color-word test, in which the subject first looks at a page with the names of colors all printed in black and then reads them as quickly as possible aloud. Then on the second page, he is presented with color strips and he names the colors aloud. Reading time here is recorded cumulatively by pairs of lines, and errors are recorded. In part three, he is presented with a page of color names all printed in colors which do not correspond to the given name. He is told to call out only the colors and ignore the words. Reading time and errors are recorded. Reading time for the second part is invariably longer than for the first part (i.e., reading color

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strips takes longer than reading achromatic words) because the perception of the color must be followed by verbal communication of its name. In the third part, two contradictory and familiar tendencies are opposed to each other: the inclination to read words, and the relevant requirement to concentrate on the colors. Rapid-color naming on part three seems to depend upon relative restriction of attention to the relevant colors and active inhibition of the more readily available response to the incongruous ~~xxx~~ color words. Various scores obtained: (17) Interference. A statistical measure based on the regression of reading time for Part Three on reading time for Part Two. (18) Reading time, colors alone (Part II). This reflects the amount of blocking on reading colors alone. Consisted on the reading time for Part II plus penalty for reading errors. (19) Temporal patterns of response. A statistically derived score.

Another test was the Incidental Recall Test. The materials are similar to those in the color-word test. After reading Part Three aloud (where he calls out colors and disregards the words), he is given another page with the same task, this time the words are thirst-related words which the authors say had no significance in this study. After this, he is asked to recall as many of the words as he can. The score here is (20) Incidental recall. The score for this is the total number of words correctly recalled from the pages of neutral and thirst-related words. (neutral words had been given before thirst-related words.)

Another test was the Size Estimation Test II. On this test, the S judged the sizes of four symbol-bearing disks under two conditions: perceptual and memory. "It was speculated that overestimation could be the product of several reaction tendencies: (a) a tendency for interesting objects (interest was enhanced by the pictures on the standard disks) to loom large in judgement; an interpretation suggested by earlier need-cognition studies; (b) a relaxed standard of accuracy, often accompanied by an absence of self-critical attitudes in judgments; (c) the greater attractiveness of the symbol-bearing disks, as compared to the empty circle of light. Subjects may unwittingly compensate for this difference by increasing the brightness of the comparison field and thereby increasing its size" (61). There were seven scores attained from this measure: (21) Constant error, perceptual. This was the error or judgment of thirst and nonthirst stimuli combined. (22) Constant error, memory. This was the error of judgment for all stimuli in the memory situation. (23) Change, thirst stimuli. This score for thirst stimuli alone consisted of the difference between constant error in the memory condition and predicted constant error. (24) Change, nonthirst stimuli. This score was computed in the same manner as # 23, using constant error values for nonthirst stimuli. (25) Variability, perceptual. This score was the standard deviation of size judgments for all stimuli in the perceptual condition. (26) Variability, memory. The standard deviation of size judgments for all stimuli in the memory condition. (27) Variability, total test. The standard deviation of size judgments for all stimuli in both conditions. (28) Variability, perceptual. This score was the standard deviation of size judgments for all stimuli in the perceptual condition.

The last test used for the constricted-flexible control variable was the Free Association Test. The S was told to report for three minutes everything that came to mind after hearing the word "dry" and then the word "house." Scores were: (28) Percentage distant, "dry." Each S's responses were classified into seven categories representing degrees of distance from the stimulus word..from direct references to dryness on through nondry and not wet. This score was the percentage of response units classified as unrelated to the stimulus word. (29) Percentage distant, "house." Responses here, too, classified into seven categories representing distance from the stimulus word. The score was the percentage of responses classified as unrelated to the stimulus word. (30) Percentage "home" response. This was the percentage of response to the stimulus word "house" that were classified in three of the seven categories. (31) Productivity. This score was the total number of typed lines in the S's protocols for the two stimulus words. (32) Average length of unit. This was the average number of lines per response unit. (Scores 31 and 32 are highly correlated.)

Field Dependence-Independence

In the original study by Witkin in 1954 (Personality through Perception), ~~KIRKEX~~

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"field dependence-independence was reported to be related to three major groups of personality characteristics revealed in the TAT, Rorschach, and Figure Drawing Test, and in interviews and case histories. Field dependence was said to be associated with (a) general passivity in dealing with the environment; (b) lack of self-awareness and relatively poor control of impulses, with accompanying fear of aggressive and sexual impulses and high anxiety; and (c) low self-esteem, including low evaluation of the body and a primitive body image. Field independence was said to be associated with (a) activity in dealing with the environment; (b) awareness of 'inner life' and effective control of impulses, with low anxiety; and (c) high self-esteem, including confidence in the body, and a relatively adult body image" (67).

Two tests used for this control variable: 1. The Rod and Frame Test. The S is blindfolded and put in a chair which for the first eight trials was tilted 28 degrees to the left, in the second eight trials it was tilted 28 degrees to the right, and in the last eight trials, it was upright. After the S was seated, the blindfold was removed and he was required to adjust a rod so that it stood vertically: "In this test, two sets of cues are pitted against each other. Accurate estimation of the verticality of the rod requires (a) that the subject attend selectively to bodily cues (his only source of information concerning the true vertical) and respond to these cues effectively; and (b) that he not attend to, or in some way actively resist responding to, the misleading frame" (within which the rod is mounted---frame and rod are coated with luminous paint and during the test are all that can be seen in a completely darkened room) (70-71). Scores obtained were: (33) Average error, body tilted. This score was the average deviation of the S's judgments from the true vertical in the first sixteen trials. (34) Average error, body erect. This score was the average deviation of the S's judgments from the true vertical in the last eight trials when the chair was not tilted. (35) Average error, total test. This consisted of the average normalized standard score for the body-tilted and body-erect trials, with the resulting average normalized.

The second test was The Embedded Figures Test. The S is shown 24 complex figures and 8 simple figures. He is shown each design one at a time and is asked to describe the over-all pattern. Then he is shown a simpler figure which is contained in the larger design he has just finished looking at and he is asked to find that simple figure in the larger design which he is given again. "To perform effectively, the subject must maintain an adequate memory image of the simple figure while searching for it in the complex figure. The more accurate the memory image, therefore, the faster the solution time, which may explain the moderate correlation often found between measures of leveling-sharpening and solution time in Embedded Figures Test" (73). Three time ~~and~~ scores and two ~~auxiliary~~ auxiliary measures were derived from this test. They are: (36) Mean log time, cluster I. (37) Mean log time, cluster II. (38) Mean log time, total test. (39) Geometricity of descriptions. A weighted score was given which expressed the complexity of geometrical description of the designs. (40) Field-dependence index. This was computed by averaging each S's standard scores for the total Rod and Frame Test and the Embedded Figures Test.

Rorschach Test: "The fact that the Rorschach Test had been administered to the sixty subjects allowed us to test the hypothesis that relationships observed by Witkin et al. between laboratory measures of field dependence-independence and Rorschach variables would also be evident in the present study" (76).

Factor analysis

Two separate factor analyses carried out; one for women and one for men. The factors were derived for a 33 score analysis for each sex. These included all of the original scores except for clearly redundant ones and indices composed of several measures. (There were a total of 40 measures in all.)

Results for Men:

"Five factors were extracted that accounted for 39.6 per cent of the total score variance. Two of the factors are interpreted. Factor I accounted for the largest

share (12.3%) of score variance and corresponded to the predicted control principle of scanning. Factor IV accounted for the next largest share of score variance (7.5%) and strongly resembled the control principle of tolerance for unrealistic experiences. Of the other factors, Factor II could not easily be interpreted. Factor III resembled certain aspects of field dependence-independence...while Factor V seemed to include constricted-flexible control and other aspects of field dependence-independence. The appearance of two factors representing these two principles for men, in contrast to the single factor for women, may have been due to the fact that eight men did not return to take the Rod and Frame Test, and that these eight were quite different in their performance in other tests from the twenty-two men who did return. " (79).

Factor I--Scanning: "This may be described as a scanning factor. It represents the degree of attention deployment to objects, object properties, and events...." High factor scores: "Subjects with high factor scores tended to scan the environment extensively. Their extreme scanning led to awareness of and responsiveness to many objects and object properties" (82). The authors then go on to describe the performance of subjects with high factor scores on significant tests. Low factor scores: The performance of subjects with low factor scores seemed to represent limited scanning. Ancillary Findings: "...the associations of subjects with high factor scores tended to drift far from the stimulus words in the Free Association Test. These subjects' performance also had a particular quality: the impression conveyed by their protocols was that they avoided the expression of personal feelings by producing a steady flow of impersonal intellectualized material. Thus, their tendency to 'scan' their own available response extensively seemed associated with intellectualizing....The extreme scanners' tendency to avoid personal interpretations of experience also seemed apparent in the Object Sorting Test. These subjects were more likely to give impersonal, objective reasons as their basis for placing objects together in a group, such as the materials of which the objects are made, or their function" (87-88). Summary: Factor I seems to confirm the redefinition of the focusing principle suggested...it is more properly labeled scanning. The extensive scanner actively peruses objects about him and is continually searching or scanning the field, becoming aware in this process not only of the field properties relevant to this present intentions but also of fringe properties. One consequence of extensive scanning of object properties is the stabilization of conceptions of objects. A second consequence of extensive scanning is a slowing of decision making. Since these subjects seemed to deploy attention to relatively many aspects of stimulation, both when the field was external and when it was internal, they took a long time to make choices. It is thus assumed that doubt and uncertainty prominently accompany extreme scanning" (88-89).

Factor IV--Tolerance for Unrealistic Experiences: "This factor appears to represent the principle of tolerance for unrealistic experiences and represents modes of organizing behavior in respect to experiences that violate the normal assumptions of reality" (89). High factor scores: "Subjects with high factor scores (tolerant of unrealistic experiences) tended to organize behavior in terms of experiences that were inconsistent with their knowledge of reality" (89). Low factor scores: "Subjects with low factor scores (intolerant of unrealistic experiences) tended to organize behavior only in terms of experiences that conformed to conventional reality or to what they knew to be objectively true" (91). Ancillary findings "In the Rorschach Test, low-scoring..subjects tended to limit themselves to clearly defined forms. They had a smaller proportion..of responses in which the form was vague (e.g., 'clouds'). The difference was most marked in their whole responses. 'Intolerant' subjects produced almost as many well-formed whole responses as 'tolerant' subjects, but they produced less than half as many vague wholes.." (92-93). Summary: Factor IV seems to represent tolerance for unrealistic experiences...The two extremes of performance represented by high and low factor scores reflected the extent to which individuals limited themselves to what they knew to be objectively true. 'Intolerant' subjects seemed engaged in continual efforts to make their experience conform to the actual state of affairs in the external world. 'Tolerant' subjects seemed in equally adequate contact with external reality, but were much more relaxed in their acceptance of both ideas and perceptual organizations that required deviation from the

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conventional. Thus, they were able to show more direct evidence of the influence of momentary feeling states on their experiencing of the external world" (93-94). The authors here are coming very close to a description of Kris' "regression in the service of the ego."

Results for Women:

Six factors were extracted for women. They accounted for more of the total variance than did the factors found for the male sample (56.1% vs. 39.6%). Three factors are interpreted. "Factor I accounted for the largest share (15.3%) of score variance and included features of the previously identified controls of field dependence-independence and constricted-flexible control. Factor II accounted for the next largest share (11.7%) of the score variance and strongly resembled the leveling-sharpening control principle. Although weaker statistically (6.8% of the score variance), Factor III is also discussed because it resembles the equivalence range control principle. Factor IV, V, and VI did not lend themselves to interpretation" (94).

Factor I--Field-Articulation: "This may be termed a field-articulation factor. It applies to situations of perceived incongruity. The nature of this factor indicates that, in the present sample at least, the variables described as field dependence-independence and constricted-flexible control may be more economically subsumed under a single control principle" (94). High factor scores: "Subjects with high factor scores tended to organize fields containing stimulus incongruities along the simplest possible lines. Because of this, they did not cope effectively with tasks in which they were required to respond selectively to relevant cues in fields containing contradictory and interfering cues. In situations where it was possible, they resolved the incongruity by responding only to the most compelling elements and ignoring others. When such a course was difficult, in the Rod and Frame Test, or impossible, as in the Color-Word Test, in which conflicting elements are physically inseparable, their performance was impaired" (95-96). Low factor scores: "Subjects with low factor scores were able to articulate incongruous configurations of cues by confining attention to those aspects of fields required by instructions; they either ignored or actively resisted responding to contradictory irrelevant cues" (97). Ancillary findings: "Subjects with high factor scores were most housewives, while most of the subjects with low factor scores were involved in careers outside the home... Since most of the employed women were married, this difference does not reflect a difference in marital status. Low-scoring subjects (field independent, flexible control) tended to be active and task-oriented in the testing situations... judging from the observations made of them during testing by ^{of the} experimenters. The high scorers (field dependent, constricted control) tended to display an anxious, driven talkativeness during testing" (98-99). Summary: "Low scorers on Factor I were able to penetrate complex configurations and attend selectively to features that were relevant in terms of test instructions. As a consequence of this, their performance on several of the experimental tasks was markedly stable. High scorers, on the other hand, were relatively unable to respond selectively to relevant features of stimulus aggregates containing contradictory cues" (99).

Factor II--Leveling-Sharpening: "This factor is consistent with the conception of leveling-sharpening offered... Factor II is relevant to situations involving the temporal patterning of stimuli. It does not represent discrimination of differences per se. Rather, it pertains to differentiation in memory organization as a function of the extent to which successive stimuli assimilate to each other" (100). High factor scores: "Subjects with high factor scores (levelers) showed relatively simple, undifferentiated memory organizations in a variety of situations. Perhaps the basic attribute of leveling is a relatively high degree of interaction among memories and present percepts, so that the elements lose their individuality" (100). Low factor scores: "Subjects with low factor scores (sharpeners) were able to maintain discrete impressions and memories of successive stimuli" (103). Summary: "The contrasting performances of levelers and sharpeners exemplified varieties of process-trace interaction that produces differences in memory organization. Sharpeners were characterized by small assimilation effects in a variety of situations, and their memory schemata seemed relatively differentiated. In levelers, successive perceptual



impressions were assimilated to each other, so that distinctions among them were blurred. Memories of past impressions were also less available to them, presumably because of the general lack of differentiation of their memory schemata" (105).

Factor III--Equivalence Range: "Factor III corresponds to the equivalence range control. Factor scores reflect the degree to which subjects judged stimuli to be similar. This factor does not represent sensitivity to differences but pertains, rather, to the subjective criteria used to categorize experiences" (105). High factor scores: "Subjects with high factor scores (broad equivalence range) showed relatively relaxed and inclusive criteria of similarity" (105). "Low factor scores: "Subjects with low factor scores (narrow equivalence range) showed more exacting criteria of similarity" (107). Ancillary findings: "Some of the qualitative features of their behavior suggested that broad-range subjects were aware of and acted on a richer array of connotations of objects than did subjects with a narrow equivalence range...they often relied on the everyday meanings as bases for sorting in the Object Sorting Test. In contrast, narrow-range subjects tended to categorize on more impersonal grounds, with less of the fabulated quality that linked the groupings of broad-range subjects to personal experience" (107). Summary: "Factor III scores represent individual differences in categorizing behavior. This factor is relevant to tests involving direct or implicit demands to make judgments of similarity. It is not relevant to discriminatory behavior as measured by other tests in the present study. Subjects with low factor scores (narrow equivalence range) were reluctant to judge disparate stimuli or distinguishable aspects of their experience as 'similar.' In the Object Sorting Test, which provided the richest source of ancillary observations, they tended to respond to the inherent properties of objects, rather than to their connotative implications. Subjects with high factor scores (broad equivalence range) were likely to dismiss differences in detail and to consider the objects in terms of their associated meanings, rather than in terms of their physical properties. At times, their emphasis on connotative meanings of stimuli led them to group the objects in terms of visual impressions of the places in which they had seen them in their everyday lives. At other times, their sortings reflected a tendency toward fabulation, so that ~~some~~ objects were linked together because of their relevance to some personal activity" (108-109).

Discussion of results: "...it is striking that all of the hypothesized controls described...received confirmation for at least one sex.". On the basis of previous studies, "...it seems safest to assume that these (sex) differences are more apparent than real. Gross sex differences were not apparent in previous studies of five of the cognitive controls...Further studies with larger and better-controlled samples of each sex are needed to explore the possibility that men and women are in fact characterized by different control principles and different relationships among control principles...The age at which some of the control principles emerge is still unknown. Ideally, future studies will take age into account and include samples of different ages for each sex." (110). "One of the most intriguing products of factor analyses is the evidence that even very simple laboratory measures (a number of which are spoken of in the classical literature as if they represented single response processes) are determined by more than one of the limited number of control principles ~~studied~~ studied here...It seems clear that more than one control principle is involved in almost any adaptive task. The Rod and Frame Test, for example, involves the extent to which an individual deploys attention (scanning) as well as his ability to attend differentially to competing cues (field-articulation)...Above and beyond the interaction of different control principles in the various tasks, the factor analyses show that two demonstrably different control principles may account for significant portions of the variance in a single score. One of the most striking examples of this occurs in the Free Association Test. Long associative units are typical of low field articulators, and also of levelers. Examinations of individual protocols shows that subjects who have both of these tendencies also have very long units, that subjects who are high field-articulators and sharpeners have very short units, and that subjects who are low field-articulators but who are also sharpeners have associative units of intermediate length. The present study can be taken as an object lesson in the complexity of cognitive organizing principles involved in even the simplest procedures" (111).



Control Principles and Styles

The fact that the factors (dimensions) are independent of each other means that individual Ss may have widely different patterns of factor scores. Thus, one female S could be low in field-articulation, high in leveling-sharpening, broad in equivalence range; another could be low in field-articulation, low in leveling-sharpening, and narrow in equivalence range. Klein, in an earlier work, has postulated that the "cognitive styles" represented by such a patterning of control principles may represent a superordinate level of control within the personality system. "In one sense, style is our answer to the issue of typology. Although it is tempting to speak of subjects who have high scores on a leveling-sharpening measure as 'levelers' and make predictions to molar aspects of their behavior, in the face of the fact that in other situations, this kind of extrapolation is not valid, leveling-sharpening is evident in response to a limited class of adaptive requirements. The other control principles, too, seem to represent relatively specific aspects of cognitive organization...Style...may allow more effective prediction to molar aspects of behavior within and outside the laboratory, some of which may not be evoked by specific adaptive requirements....A subject's style also has direct implications for his cognitive behavior in adaptive situations of greater complexity than our laboratory tests....In order to observe some of the combinations of control principles behaviors characterizing the subjects of the present study, we undertook a clustering of persons based upon combinations of factor scores. Because of small samples, the clusters extracted can only serve as examples of possible combinations....the findings that follow are only suggestive" (115-117). Most clusters were comprised of three or four Ss, one had only 2 Ss, and one had as many as six.

Clusters of men: "Scanning is a distinguishing characteristic in six of the seven clusters; tolerance for unrealistic experiences in four; constricted-flexible control in five; and field-articulation in five" (118).

Clusters of women: "...field-articulation is a distinguishing characteristic in four of the six clusters; leveling-sharpening in five; and equivalence range in five" (118).

Clusters vs. single control principles: consensus in response to a personal inventory: "If we assume that a cluster is primarily an expression of cognitive style, it should follow that members of a cluster are more homogeneous in their reactions to certain extralaboratory situations than subjects grouped on the basis of single control principles. This follows from our assumption that the control principles refer to single aspects of cognitive organization, whereas the styles correspond to broader aspects. To test this argument, we examined patterns of responses to a Personality Inventory, a list of 234 statements administered to each of our sixty subjects...These items cover a gamut of experiences--relationships with people, awareness of feelings, work habits..etc...It was hypothesized that members of a cluster would show greater consensus (agree or disagree unanimously with more items) than an equal number of subjects who were at the extremes on each of the constituent factors. It was further hypothesized that the cluster consensus would be greater irrespective of item content....our principle hypothesis seems confirmed for the female clusters, but not for the male. The female clusters show greater consensus on a wide variety of topics than do equal numbers of subjects characterized by similar positions in respect to single control principles.....the greater consensus for the cluster on these items seems to suggest that style is a more effective basis for predicting defenses than individual control principles [here, referring to an examination of how a cluster agreed or disagreed in responding to compulsive behavior items]. The 'obsessive-compulsive' items included in the inventory do not, however, provide an adequate basis on which to evaluate this behavior and the defenses underlying it" (121-123).

Discussion: Whatever relationship is ultimately demonstrated between style and the kinds of self-evaluation provided by inventory responses, the analysis described above suggests the fruitfulness of exploring such complex behaviors from the vantage point of style. What are the implications of these findings for understanding

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the clusters? For one thing, large consensus on the Inventory suggests that female cluster members have similar attitudes toward a wide variety of situations. We cannot be sure from the Inventory alone that they would behave alike when faced with a particular set of circumstances, but their attitude seems to be similar. Thus we can say that the clusters of women are relatively homogeneous as to attitude, or outlook, and in this way differ from the factor-score groups. The relative lack of agreement shown by the control principle groups in response to the Inventory argues against making assumptions about a sharpening type, an extensive scanning type, etc. The same point is illustrated ~~in~~ in the make-up of the clusters. The appearance of sharpening, for example, in two clearly distinguishable combinations...

indicates that sharpening is relevant only to a limited aspect of cognitive organization; it does not dictate a subject's other factor scores, nor does it tell us much about broader aspects of his personality organization. The proof of the style hypothesis--that the clusters represent something more than the sum of their parts--must await further experiments. The present Inventory findings should be followed up more systematically by relating cluster and factor scores to various complex behaviors. Still another possibility is to examine the performance of several people from different clusters ~~in~~ on a particular task to see how they differ. Such an approach would require observation of the processes by which responses are achieved, rather than exploration of relationships between outcome scores" (123-126).

Cognitive controls and defenses

"..cognitive controls were described as structures intervening between motivational states and response, but not tied ~~to~~ to specific drives. In this respect they reflect a function ordinarily attributed to defenses. In psychoanalytic theory, defenses are conceived of as relatively stable organizations serving to modulate and affect the consummation of needs; and their operations are effected through such cognitive functions as memory, concept formation, perception, and judgment. Repression and denial are inferred from failure and omissions in recall and perceptions; regression from indicators of developmentally earlier thought modes or from qualities of thinking that characterize the primary process. Thus, control principles and defenses are somewhat alike. The two concepts come into being, however, for different reasons. Defenses were originally conceived of ~~solely~~ as modes of ~~dealing~~ ~~with certain configurations and events in external reality~~ resolving conflict; control principles were conceived of solely as modes of coping with certain insistent configurations and events in external reality.

"At present, five ways of looking at the control-defense problem present themselves. A. All defenses have adaptive as well as conflict-resolving attributes. Hartmann..

..has pointed out, for example, that in addition to its defensive properties, intellectualization 'has another, reality-oriented, aspect also, showing that this mechanism of defense against instinctual drives may at the same time be regarded as an adaptive process.' It is possible, therefore, that control and defense may be the same process looked at from two different vantage points--adaptation and conflict. B. Defenses, as they emerge in the course of development, may generalize in such a way as to extend certain schemata of organization to adaptive behaviors. That is, 'character defenses' may become preferred means of adaptation. C. Particular emphases in the employment of defenses may be occasioned by individual variations in ~~the~~ 'the maturation and exercise of the apparatuses of the conflict-free ego sphere' (Hartmann...). Cognitive control principles--representing basic schemata of organization in adaptive behavior--may thus be preconditions for the emergence of defensive structures. D. Control principles and defenses may be distinguishable in terms of their antecedent conditions. The antecedent conditions of defense operations always include internal conflict....We assume that the antecedent conditions of cognitive control principles need not involve an internal conflict; primary among these antecedent ~~conditions~~ ~~are~~ realistic issues, such as the solving of a problem, the satisfaction of a biological need, or the performance of a task. E. If cognitive controls and defenses are related to each other but have different antecedent conditions, it may ultimately be most economical to conceive of repression

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and leveling (or isolation and extreme scanning) as two aspects of a higher-order principle governing a large segment of secondary-process functioning" (127-128).

Leveling and repression: In this study, leveling and sharpening were used to describe the loss or preservation of distinctions among a series of stimuli. "Levelers are characterized by maximal assimilation effects, and by memory organizations in which the fine shades of distinctions among individual elements are lost.... In psychoanalytic writing, repression proper, as distinguished from primal repression... is conceived of as the withdrawal of consciousness from an idea with which an unpleasant affect is associated. According to Freud, this expulsion from consciousness is assisted by the attraction exerted by an already unconscious idea.... the process of repression is at least analogous to the process of assimilation apparently measured in our tests of leveling. In both repression and leveling a new idea or experience assimilates to an older one by virtue of the relationship between them. As a consequence, the assimilated idea loses its individuality, and hence its availability to consciousness as a discrete entity. It seems plausible to assume that repression as a typical way of coping with internal conflict can occur most easily in persons whose memory organization is congenial to this kind of easy assimilation.... The apparent similarities between leveling and repression led us to explore possible relationships between the two processes. The specific question we asked was: Are persons who rely on repression as their principal means of dealing with conflict-arousing ideas levelers in our laboratory tests?" (129-130).

Repression cannot be observed directly. It is inferred from the presumed effects of reliance upon this defense. Ss were classified in terms of predominant defenses on the basis of the Rorschach. Results indicated that eight of the thirty men were judged to rely upon repression as their principal defense. Six of these eight were levelers as indicated by scores in the upper half of the distribution of leveling-sharpening index scores (no factor scores could be obtained for men). Repression was a dominant defense in eleven of the thirty women, and none of these eleven women were relatively extreme levelers in the distribution of Factor II (leveling-sharpening) scores. Although the numbers of men and women who were judged to rely upon repression as their primary defense were small, results for both sexes pointed to a close association between repression and leveling.

Scanning and isolation: "Repression, narrows awareness; isolation broadens it. By keeping ideas separate from their emotional components, isolation increases the repertoire of consciously accessible ideas; even perverse, murderous, and incestuous thoughts can be admitted to consciousness without horror or disgust" (133). The defense of isolation operates to separate affect from idea, so that potentially unpleasant ideas become more tolerable. Cleavages occurring within networks of ideas, such that individual components are rendered tolerable, are also referred to this mechanism. Again, various signs on the Rorschach, both quantitative and qualitative, were used to identify "isolators." Isolation was conspicuous in the protocols of nine of the thirty men. Eight of these nine men had Factor I (scanning) scores in the extreme-scanning half of the distribution... Five of the six women judged to rely principally on isolation had scores in the lower half of the average-error distribution for Size Estimation Test I (factor scores could not be obtained for women). Although not statistically significant, it was in the predicted direction.

Discussion: Results were consistent with the hypothesis of an association between repression and leveling and isolation and extreme scanning. "It is important to note that these predicted relationships between defenses and controls are unidirectional. Extreme repressors tend to be levelers and extreme isolators tend to be broad scanners, but the converse is not true. An extreme leveler may or may not be unusually repressive; an extreme scanner may or may not be notable for isolation. Thus, a variety of defensive patterns may characterize extreme levelers or scanners. The unidirectionality of these relationships may offer some support to the hypothesis that controls provide preconditions for the emergence of defenses. That is, repression may be a likely defense in an extreme leveler, but not in an extreme sharpener.



In this view, repression would emerge against a background of a general tendency toward maximal assimilation between present and past experiences that leads to relatively undifferentiated memory organizations. Although other conditions are necessary for the actual occurrence of repression, the tendency toward assimilation (leveling) seems to be a necessary antecedent structure. A final answer to questions concerning the relationship between various controls and defenses is, of course, not provided by the present data. Adequate understanding of these relationships may be possible only when developmental studies of the emergence of both controls and defenses are completed" (136).

Retrospect and Prospect

"Each of the six principles ~~discussed~~...was evident in the cognitive behaviors of the present sample, in one or the other sex. Among men, the clear factors were scanning and tolerance for unrealistic experiences; among women, field-articulation, leveling-sharpening, and equilibrium range. The interpretation of the scanning factor is a reformulation of the earlier focusing principle; field-articulation represents a composite of the earlier constricted-flexible control and field dependence-independence principles....Perhaps the most salient new finding of the present study is that these control principles are independent of each other. To know that a person is an extreme leveler does not allow us to predict his preference for broad or narrow conceptual categories....It implies that it is necessary to sample the various controls in a person's cognitive behavior if we are to understand his 'cognitive style.'" (137-138). "The present study has provided us with some first glimpses of relations between cognitive control principles and the structures for resolving internal conflict (defenses). Cognitive controls are evident in behaviors which do not involve internal conflict. Still, descriptively, certain control principles do seem quite similar to particular defenses, at least in the kind of adaptive consequences they lead to...Although some of the evidence seems to support the conception that cognitive controls may be preconditions for defenses, developmental studies are needed to answer questions concerning the emergence of these aspects of cognitive organization" (137-140).

Further studies needed: 1) The validity of the control principles. Although some of the control principles observed in the present study lend themselves readily to interpretation, others are still relatively unclear. 2) The generality of control principles. Studies of individual consistencies such as we have reported lend themselves to many extensions. In the main we have confined our studies to laboratory tasks. Nevertheless, the descriptions of the control principles tempt us to explore the general hypothesis that they are important determinants of other categories of observable behavior....Formulating hypotheses from a control principle to a new situation in which the control principle may be relevant must be preceded by careful consideration of the problems confronting the subject in the new test situation....3) The stability of cognitive controls. A related problem concerns the elasticity of controls when a person is subjected to special training or experiences, or special motivational conditions. It is important to know whether a leveler can behave like a sharpener if he is motivated to do so...also fruitful to observe changes in controls in persons undergoing psychotherapy or psychoanalysis. 4) Systematic variation of criterion tasks. In these experiments, the stimulus conditions were varied. It might be profitable to keep the stimuli constant and vary the instructions. 5) Controls and defenses. Since an adequate evaluation of defenses is difficult to achieve by other methods, it may well be well to study persons who have been observed intensively in the clinic. 6) Cognitive controls and intelligence test performance. "Since tests of intelligence are similar in many ways to our tests of cognitive organizing principles, to hold intelligence constant in the investigation of a cognitive control principle creates a pseudo issue. Intelligence does not involve a 'g' factor that can be studied as an entity. It seems likely that the control principles are involved in responses to various subtests of intelligence scales" (143-144). 7) Control principles, empathy, and communication. Questions concerning the effects of control-principle variations on communication and empathic understanding between individuals. Psychotherapists of equal skill vary in their



effectiveness with different types of patients. "Whether two people with similar cognitive styles achieve better empathic understanding than two people with different styles is an avenue for research that has practical significance for both diagnosis and psychotherapy" (145). 8) Additional control principles. The present group of control principles is not thought to exhaust the realm of enduring attributes of cognitive organization relevant to adaptation. 9) Developmental studies. When the validity and generality of controls have been adequately demonstrated for adults, studies can be done of the developmental emergence of these principles. It is important to know at what ages consistent individual differences in various control principles first become apparent.

Summary: "We ~~ak~~ have seen evidence of the operation of several cognitive structures in a wide variety of situations. We consider these structures essential aspects of ego organization. Our study has provided us with glimpses of relations between two of these structures and certain defensive structures defined earlier by Freud and observed primarily in the clinic. Although in some ways it is a long leap from the laboratory to the psychotherapist's consulting room, our studies of individual consistencies have enabled us to see links between the cognitive controls that govern adaptive behaviors and those relevant to the channeling of drives in conflict. The problem that joins the laboratory to the psychoanalyst's couch is that of personality organization, involving phenomena that cannot be adequately sampled in either of these settings alone. The essential question we have posed concerns the individual's style of adaptation--his mode of coming to terms with the world--conceived of as the patterning or arrangement of his functioning along several dimensions of ~~some~~ cognitive control. We have sampled a vast area where the efforts of the healer and the experimenter may converge. We regard the present study as a step toward such a convergence. Our results raise more ~~x~~ questions than they answer, but in so doing help to delineate a fertile area for further study" (146-147).

