

RELIABILITIES AND INTERCORRELATES
OF MEASURES OF PERSONALITY BREADTH,
PERCEPTION AND COGNITION

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RELIABILITIES AND INTERCORRELATES OF MEASURES OF
PERSONALITY BREADTH: PERCEPTION AND COGNITION

By

Kenneth A. Perkins

AN ABSTRACT

Submitted to the College of Science and Arts of
Michigan State University of Agriculture and
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This study was primarily designed to explore a number of behavioral tasks in search of evidence for a generic concept of "personality breadth" as formulated by King. Secondary goals concerned King's concept of "perceptual breadth" and "cognitive breadth" as interpreted from several theoretical positions. Cognitive and perceptual processes were stressed in the selection of appropriate tasks to be used in the study.

Several test instruments were utilized and were discussed in terms of their relevance to broad or narrow perceptual or cognitive behavior. Six diverse tasks were found to be sufficiently reliable to be included in the investigation.

The procedure consisted of group and individual testing of 180 Ss. Group testing included the administration of three tasks: Category Width Scale (cognitive); Object Sorting (cognitive); and, Free Recall of Unrelated Words (perceptual). In individual test sessions, Ss responded to: Identification of Stimulus Elements (perceptual); Visual

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Scanning (perceptive-cognitive); and, Blot Association (cognitive). An intercorrelational analysis was carried out concerning broad and narrow task behavior.

The generic concept of personality breadth was not adequately supported. Some indication of breadth in cognitive task behavior was indicated and discussed. The formulation of a unitary broad-narrow continuum of perceptual performance was especially supported by the analysis and appeared to possess important implications for further breadth research of perceptual processes.

An additional analysis of the relationship between perception and cognition with intelligence was also conducted and suggested a perceptual-intelligence relationship which might also prove fruitful for further investigation.

Approved Clarence L. Winder
Major Professor

February 23, 1962
Date

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I. INTRODUCTION

What might be called "personality breadth" has been dealt with by a number of investigators. As early as 1902, Gross (cited by MacKinnon, 1944) described two opposed types of mental process, a deep-narrow type and a shallow-broad type. He assumed a correlation between the intensity of any experience and the tendency for that experience to persist (secondary function) and to determine the course of subsequent mental associations. The deep-narrow process he characterized as involving an intense experience followed by a lengthened secondary function which would inhibit the immediate formation of new associations. Conversely, the shallow-broad process would involve a less intense experience which would decrease the amount of perseveration and permit more immediate formation of new associations.

In an attempt to formulate the nature of intervening mental processes, Tolman (1948) introduces the construct of cognitive maps. He speaks of the selection of stimuli to be admitted to the nervous system and the way in which mental maps (or routes to a goal) are formed. A narrow, strip-like map is seen as a relatively simple and single path to a goal, while the broader, more comprehensive map is one which takes in a wider arc of the environment

and permits alternate routes to the goal. Rokeach (1951a, 1951b) uses Tolman's orientation to conceptualize and measure a continuum of cognitive organization. His subjects were instructed to interrelate a list of ten concepts (e.g., Buddhism, Communism). Scores for cognitive organization were assigned along a continuum ranging from comprehensive to isolated to narrow. Gruen (1959), investigating the correlates of cognitive maps, postulates four dimensions or properties, which he sees as "styles of cognitive representation." The dimensions that he posits are as follows: accuracy of representation (of the environment); outer complexities (inclusion of outer events); inner complexities (inclusion of inner events such as motivation); degree of organization (degree of integration of subparts of the overall cognitive field). A word or two might be given to two of the dimensions, outer complexities and degree of organization. The former reflects breadth of awareness of environmental stimuli, while the latter is quite similar to Rokeach's breadth of cognitive organization.

A number of different types of cognitive style, several of which pertain to personality breadth, have been developed by Klein and his associates in their research program. One such cognitive style is scann-

ing, or focusing, as it was earlier termed (Schlesinger, 1954). Klein (1958) describes the "scanner" as one who is aware of a broad array of the background qualities in a stimulus field. This awareness stems from a broad and intensive deployment of attention and involves "not only intense concentration on the central task but an indiscriminate peripheral sensitivity that renders many aspects of the field available to conscious recall" (Klein, 1958, p. 109). Leveling-sharpening is another type of cognitive style that arises from different patterns of attention deployment (Holzman, 1954). For "levelers", at one end of the pole, stimuli tend to lose their identity, while the various elements of the stimulus field become more distinct for "sharpeners." Thus, it would appear that scanning represents a slightly more elaborate version of Gruen's outer complexities. On the other hand, leveling-sharpening does not seem to bear so directly on the notion of breadth but more on stimulus articulation.

Still another dimension of cognitive style evolving from the aforementioned research program is that of equivalence range, which is defined as the range of objects a person is willing to subsume under one category (Gardner, 1954). This concept seems to share some common aspects with both scann-

ing and leveling-sharpening. Individual differences for equivalence range are derived from performance on the following task. The subject is presented with a variety of stimulus objects (e.g., cup, fork, cigar) and instructed to sort the objects into as few or as many categories as he thinks necessary. Any principle can be used in constructing a category, and the number of categories is solely a matter of personal preference. The fewer categories that the subject uses in his sorting, the broader is his equivalence range. Sloane (1959) assembled and factor analyzed a large battery of tests, all purportedly measuring equivalence range. The resulting factor structure was fairly complex and difficult to interpret. Tests requiring sorting behavior correlated only with each other, and all such tests loaded on what was most likely a "method" factor.

When objects are sorted into categories, evaluation of performance can focus either on the objects, as in equivalence range, or on the categories. Sorting on the basis of a few categories would indicate not only a broad equivalence range but also the use of broad categories. Perhaps, the distinction is a trifling one, but it has served as the basis for constructing a different instrument. Pettigrew (1958) has developed a paper and pencil test to measure

the range or width of an individual's cognitive categories (Category Width Scale). On this scale, subjects are asked to estimate the extremes for twenty categories, e.g., length of whales, weight of ships, with the results revealing that the subjects tend to be consistently broad, medium, and narrow in the category widths. Pettigrew suggests that, in addition to equivalence range, category width may tap "risk-taking" behavior. Broad categorizers seem to have a tolerance for type I errors, while narrow categorizers tend to make type II errors.

King (1960) has emphasized broadness-narrowness in perceptual style as a counterpart to Klein's emphasis on cognitive style. Using the hypothetical construct of "reactive potentials", individuals are conceived as varying in the evenness of the distribution of attention over the reactive potentials. Broad individuals display a relatively even distribution of attention, resulting in a greater awareness of the perceptual field. In contrast, narrow individuals are characterized by a relatively uneven distribution of attention over the reactive potentials and a more restricted awareness of the environment. This model was developed in an attempt to predict individual differences for a variety of "task" behaviors--e.g., learning, problem-solving.

In psychopathology, it seems possible to speak of "exaggerations" in personality breadth. Cameron (1939, 1951) has demonstrated the phenomenon of "overinclusive thinking" in schizophrenic patients. The source of this behavior is attributed to a "failure to exclude the irrelevant and inconsequential" elements in the social environment. Epstein's (1953) research in this area is based on the Inclusion Test, an objective measure of overinclusion. His results support Cameron's view that schizophrenic thinking is overinclusive in nature. Epstein regards this form of deviant behavior as resulting from a failure in discrimination arising out of a defect in attending or in focusing attention.

There are both similarities and differences among these various concepts of personality breadth. All of the approaches emphasize style, as opposed to content, in personality and embrace some "broad-narrow" continuum. Moreover, the notion of organization is involved in some of the concepts (e.g., Rokeach, Gruen), implied in others (e.g., Gardner), and is not a part of others (e.g., King). Some of the concepts appear to be almost interchangeable --e.g., equivalence range and category width. Several approaches use some underlying notion of attention deployment--dimensions developed by Klein and associ-

ates (scanning, leveling-sharpening, equivalence range) and King's "perceptual breadth."

Based upon these investigations, it is conceivable to hypothesize a general concept of "personality breadth" which may be seen as underlying the individual's perceptual and cognitive approach to the environment. It is the primary purpose of this study to examine, in an exploratory fashion, the reliability and intercorrelation of a variety of measures which seemingly pertain to personality breadth. Although it is difficult to isolate perceptual from cognitive function in test situations, an attempt will be made to present some tasks which stress primarily perceptive behavior, some which emphasize cognitive behavior, and others which may be seen as perceptive-cognitive (stressing both types of function). If Sloane's factor analytic study is used as a guide, only limited generality can be expected among the measures.

II. METHOD

Measures of Personality Breadth

Rationale for the selection of test materials was based primarily upon an interest in both perceptual and cognitive type tasks which could be conceived of as reflecting personality breadth. Certain instruments present S with achievement tasks (e.g., identifying visual stimuli, recalling specific words) in which performance is evaluated on the basis of "right" and "wrong" answers. Other tests are seen as preference tasks (e.g., grouping individual stimuli, selecting numerical estimates, recognizing visual percepts) wherein there are no specifically correct answers; rather, S selects responses he feels are most appropriate or relevant. Attention deployment and memory function are more involved in some tasks than in others. Some tests were administered to groups of Ss, while others involved individual testing. Six instruments were utilized: Category Width Scale, Object Sorting, Free Recall of Unrelated Words, Identification of Stimulus Elements, Visual Scanning, and Blot Association. The following discussion will present a general consideration of the nature of the tests, method of presentation, and types of function involved. For more specific reference to stimulus materials and

complete instructions, see Appendices.

Category Width Scale (CW). This paper and pencil instrument was developed by Pettigrew (1958) to reflect the range or width of an individual's cognitive categories. The scale was presented as an "Estimation Questionnaire" (Appendix A) composed of twenty items each requiring an estimate of extremes for such material as "length of whales" and "annual rainfall in Washington, D. C."

The scale can be administered to groups and is scored on the basis of how far the selected alternative is from the established mean. It appears to be an achievement task stressing accuracy of estimates; however, it is regarded as a preference test since S is required to select responses from given estimates. The task can be classified as principally cognitive in nature. In terms of "personality breadth", a high total score by an individual indicates wide-span and suggests broad cognitive categorization.

Object Sorting (OS). Gardner's original test (1953) has been adapted by Clayton (1959) into a paper and pencil form called Word Sorting. Clayton regards this adaptation as a more symbolic equivalent of the original object sorting task. The purpose of the test is to indicate the extent of an individual's

equivalence range. Two equivalent forms (Clayton reports a correlation of .90, 1959) were used in this study (Appendix B). Each form consists of fifty words which refer to fifty objects. The sorting was done by having S write down in groups the words that seemed to him to belong together.

The test was constructed for group administration and is seen as involving cognitive functioning wherein objects are grouped on the basis of personal preference. Equivalence range is indicated by the range of objects S is willing to include under one category--e.g., the formation of fewer categories is defined as broad performance.

Free Recall of Unrelated Words (FRUW). This task was developed by King for the present study. It consists of four separate lists of fifteen unrelated words selected from Thorndike and Lorge (1944) (Appendix C). Each list was read to Ss at the rate of one word every two seconds with a three minute interlist recall period. The response measure was total number of words recalled.

The word lists can be administered to groups. The test is conceived of as a perceptual task stressing achievement to maximum possible recall. Distribution of attention can be seen as a relevant factor concerning performance on this task. Broadness

is indicated by greater recall of words for all four lists.

Identification of Stimulus Elements (ISE). The ISE task, also constructed by King, requires the identification of elements from a complex, visual stimulus pattern. Five chromatic stimulus configurations (Appendix D), each consisting of eight different elements, were constructed on separate 5" x 8" cards and each was assigned a nonsense syllable label, i.e., CAX, MOG, LUD, BIV, JEK. Additionally, the forty stimulus elements were individually reproduced on 5" x 8" cards. A training series, followed by a test series, was administered to all Ss. Training was designed to establish the relationship between the nonsense labels and the five stimulus patterns. Testing required the identification of each of the forty individual stimuli.

The test was designed for individual administration. Total number of correct identifications is interpreted as perceptual breadth on this task--e.g., a large number of correct responses is seen as broad performance. The task stresses achievement in that S is expected to strive for a maximum number of correct identifications. Distribution of attention can also be related to this type of task behavior.

Visual Scanning (VS). King has also designed a Visual Scanning task. A 12" x 12" card containing sixty-three printed words selected from Thorndike and Lorge (1944) was utilized. The task was designed such that seven individual meaningful categories (e.g., time, food, colors) were represented --each category containing nine different words (Appendix E). The stimulus field was originally scaled into nine equal sectors. One word from each category was randomly placed in every sector. The finished task did not reveal internal structuring as sector lines were removed from the card. Two equivalent forms were developed and are referred to as VS_I and VS_{II}, respectively.

The tests were constructed for individual administration. Both forms (VS_I and VS_{II}) were presented to all Ss. Each presentation was followed by a recall period during which S wrote down all words he could remember. A "Post-Test Inquiry" (Appendix F) designed to reveal S's approach to the scanning tasks was administered after the second recall period.

Response measure for this task was total words recalled from both forms. In terms of breadth, a large number of recalled words is interpreted as broad performance. This task is regarded as primarily achievement in nature, since S is expected

to strive for accurate recall to a maximum of sixty-three words per card. The task is believed to elicit two types of function; perceptual and perceptive-cognitive. The first presentation (VS_I) can be conceived of as primarily a perceptual task involving distribution of attention. On the other hand, a second presentation (VS_{II}) can be seen as more highly affected by cognitive functioning involving increased evaluation and a change of strategy. A subject may shift his approach and strive for higher recall by means of relating or categorizing words he perceives as similar. On this basis, some Ss may be conceived of as "changers" versus others classified as "non-changers."

Blot Association (BA). This test, based upon a similar task used by Sloane (1959), consisted of ten achromatic Rorschach inkblots individually presented on 5" x 8" cards and two response forms (Appendix G). The response lists (selected from Beck, 1950) contained ten percepts for each blot--five F-plus and five F-minus. The subject was instructed to indicate for each blot those responses in its list which reminded him of or resembled the blot. Scoring was based upon total number of percepts recognized for all ten inkblots.

The test was designed for individual administra-

tion. Inasmuch as the task requires S to attempt to apply specific percepts to the stimuli, it is conceived of as a cognitive task. Breadth of performance is reflected by total number of responses selected from all ten blots--e.g., a large number of responses indicates broad performance.

Subjects and Procedure

One-hundred eighty undergraduate, male students enrolled in general introductory psychology courses at Michigan State University served as Ss for this study. Only male Ss were utilized in an effort to control for possible sex differences in the respective tasks.

Test administration involved both group and individual sessions. Initially, Ss were presented the CW, OS, and FRUW instruments in their respective classroom settings. Following group testing, Ss were provided with sign-up sheets to register for individual follow-up testing, during which time the ISE, VS, and BA tasks were administered.

III. RESULTS

Reliability

Reliability coefficients for the CW, OS, ISE, VS, BA, and FRUW instruments are presented in Table I. All reliabilities were determined by means of the Pearson product-moment coefficient of correlation (r) with the Spearman-Brown correction for length of test (Guilford, 1956). Alternate Forms (A-F) or Odd versus Even (O-E) procedures were employed in accordance with the nature of the respective test data.

Total sample size ($N=180$) was utilized for all instruments excepting OS. Time restrictions on group testing did not permit the administration of OS_{II} to all Ss; however, inasmuch as the obtained coefficient ($r=.903$) is comparable to that of Clayton's original analysis ($r=.90$, as noted above), it was not believed that a reduced sample size would in this instance invalidate the reliability estimate for the Object Sorting task.

It may be seen that each instrument yielded a reliability coefficient sufficiently large ($p \leq .01$) to justify its inclusion in the study.

Intercorrelation

Correlational analyses are presented in two

TABLE I
RELIABILITY COEFFICIENTS OF BREADTH TASKS

Test	Mean	S.D.	Range	N	r ₁	p
CW	65.12	.016	11-97	180	.883	(O-E) ₂ p<.01
OS	21.66	.014	6-48	79	.903	(A-F) ₃ p<.01
ISE	18.82	.034	6-36	180	.735	(O-E) p<.01
VS	29.43	.042	16-57	180	.661	(A-F) p<.01
BA	24.39	.009	7-69	180	.937	(O-E) p<.01
FRUW	29.64	.040	17-46	180	.683	(A-F) p<.01

¹ Spearman-Brown correction

² Odd-Even

³ Alternate Forms

stages--i.e., Basic Analysis, Supplementary Analysis. The basic relationships include the six primary instruments (CW, OS, ISE, VS, BA, FRUW). An additional relationship is discussed in the Supplementary Analysis which compares the basic tasks with a selected part-test; namely, the first presentation of Visual Scanning (VS_I).

Table II presents a list of all instruments with a concomitant indication as to the type of function involved in each task.

Basic Analysis. Product-moment intercorrelations were calculated for the six basic instruments. The resulting fifteen intercorrelations are presented in Table III. Correlations of $r = .148$ and $r = .194$, or greater, are needed for two-tailed significance at the .05 and .01 levels, respectively. There are four correlations significant at the .01 level. They are: OS-BA, ISE- VS_I , ISE-FRUW, VS_I -FRUW.

It can be seen that significant relationships were obtained between two of the cognitive tasks (OS-BA) but not with the third (CW). Categorical sorting behavior as discussed by Sloane with regard to OS may also be involved in the BA procedure and might account for the relationship between these two cognitive tasks and the lack of relation between

TABLE II
TEST SUMMARY

Instrument	Type of Function
BASIC TASKS:	
Category Width	(CW) Cognitive
Object Sorting	(OS) Cognitive
Free Recall of Unrelated Words	(FRUW) Perceptual
Identification of Stimulus Elements	(ISE) Perceptual
Visual Scanning	(VS _T) Perceptive-Cognitive
Blot Association	(BA) Cognitive
SUPPLEMENTARY TASKS:	
Visual Scanning-- first presentation	(VS _I) Perceptual
College Qualifica- tion Test	(CQT) Intelligence

TABLE III
BASIC INTERCORRELATIONS (N=180)

	CW	OS	ISE	VS _T	BA
CW	....	....	....	....	....
OS	.104	....	....	....	....
ISE	.042	-.046	....	....	....
VS _T	-.115	-.054	.243*	....	....
BA	-.001	-.205*	-.072	.041	....
FRUW	-.015	.071	.312*	.362*	-.093

*p < .01

these and the methodologically different CW task.

The two perceptual tasks (ISE, FRUW) are also significantly related, as would be expected.

The lack of significant relationship between the cognitive tasks and any of the perceptual instruments, coupled with the significant relationships of the perceptive-cognitive instrument (VS_T) with the perceptual (ISE and FRUW) and not with the cognitive tests would tend to suggest that the factor contributing to correlation is in these instances the perceptual component in VS_T task behavior. The nature of this supposition may become more apparent through analysis of supplementary test data.

Supplementary Analysis. The additional subtest (VS_I) was correlated with the basic tests and the results presented in Table IV.

As would be expected in a part-total analysis, the Visual Scanning subtest (VS_I) correlated significantly with the total VS task (VS_T). Additionally, VS_I responses relate significantly to ISE, FRUW, and to CW. The correlations with ISE and FRUW are in the expected direction and follow the trend of perceptual-perceptual relationships. However, a significant negative correlation is observed in the comparison of VS_I responses to CW estimates, in a direction opposite to expected results. This seemingly

TABLE IV
CORRELATION WITH VS_I
(N=180)

Test	r
VS_I / CW	-.169*
VS_I / OS	-.085
VS_I / ISE	.163*
VS_I / VS_T	.873**
VS_I / BA	.007
VS_I / FRUW	.313**

* $p < .05$

** $p < .01$

paradoxical indication tends to become resolved, however, upon investigation of the nature of the two instruments.

The CW task is seen as one that involves primarily cognitive behavior on the part of S, while the type of response required in the VS_I situation has been conceived of as perceptual. As was suggested above, tasks primarily involving perceptual function tend to interrelate, as do those in which cognition is prevalent, but significant direct interrelationships between perceptual and cognitive tasks have not been observed. In fact, it would appear that perceptual versus perceptual and cognitive versus cognitive relationships maintain regarding the conception of personality breadth, but that perceptual versus cognitive functions tend to produce inverse relationships concerning broad and narrow behavior--such is the suggestion, at least, in the instance of CW performance. Examination of non-significant correlations discloses a directional tendency in accordance with these speculations; however, present information is insufficient and does not provide for further consideration of this hypothesis.

Intelligence and Breadth

An hypothesized relationship between intelli-

gence and personality breadth was suggested and tentatively explored by means of College Qualification Test (CQT) results which were available for ninety-seven Ss from the present sample. Although the CQT instrument can not be strictly considered an intelligence test, the assessment of knowledge provided by this scale was believed to be suggestive of an individual's general intellectual ability. Consequently, relationships between CQT scores and the battery of seven tests were analyzed for the available ninety-seven Ss. The results of the Pearson coefficients (r) are presented in Table V.

Only two coefficients proved to be significant at the .05 level ($r = .200$, two-tailed), they are: CQT-ISE, CQT-FRUW. Both correlations are in the expected direction regarding breadth--i.e., a positive relationship. It may also be noted that the two tasks with which CQT is related are perceptual instruments. For further consideration, it would be suggested that intelligence and perceptual breadth may be to some extent related; however, this area remains for future investigation.

TABLE V
CORRELATION WITH CQT
(N=97)

Test	r
CQT / CW	-.003
CQT / OS	.038
CQT / ISE	.322*
CQT / VS _T	.096
CQT / VS _I	.019
CQT / BA	-.069
CQT / FRUW	.272*

* $p < .05$

IV. DISCUSSION

Results of the intercorrelational analysis indicated an apparent lack of relationship between cognitive and perceptual tasks as groups. Consequently, support was lacking for the formulation of a general unitary concept of personality breadth. However, several additional relationships relevant to conceptions of cognitive and perceptual breadth continua suggest plausible alternatives to the "generic hypothesis."

In terms of cognitive breadth, three tasks (Object Sorting, Blot Association, Category Width) were utilized to investigate several theoretical approaches. The OS task was believed to illustrate Gruen's "degree of organization" principle and "breadth of cognitive organization" as discussed by Rokeach. Similarly, equivalence range functioning as well as cognitive organization were explored by means of all three instruments. Breadth of performance was defined for each of the tasks and intercorrelations were calculated. Results indicated a relationship between OS and BA, but no appreciable correlations between either of these and the CW instrument. This lack of relationship was discussed earlier and is not necessarily evidence against the concept of cognitive breadth. Rather, methodo-

logical differences concerning task requirements, as discussed by Sloane, were believed to be of importance in this instance. Such methodological differences, coupled with an arbitrary selection of test instruments, might not preclude the postulation of a broad-narrow continuum of cognitive performance; but would suggest the hypothesis that cognition relates to more than one breadth continuum. The analogous assumption did not seem necessary in terms of the perceptual breadth concept.

It would appear that Gruen's "outer complexities" and the "principle of scanning behavior" as discussed by Klein and his associates are involved in King's delineation of perceptual breadth. As noted earlier, King has incorporated these principles into his conception of factors that contribute to broad and narrow perceptual task behavior, with special consideration given to the role played by attention in such functioning. This concept was investigated by means of three diverse test instruments--i.e., Identification of Stimulus Elements, Free Recall of Unrelated Words, Visual Scanning. Results of the correlational analysis indicate that varied perceptual task behaviors do individually illustrate broad and narrow functioning and that there tends to be a small but significant interre-

lation of such behavior across tasks. Consequently, it is believed that the results support formulations concerning perceptual breadth sufficiently to warrant further investigation of this concept.

Thus far the discussion has implied that perceptual and cognitive breadth phenomena involve "pure" perceptual or cognitive processes. The difficulty involved in differentiating between these two processes was suggested above. The task becomes still more difficult when other possibly related factors or processes are also considered.

For example, an alternate hypothesis for the obtained results would be to consider the function of learning in perceptual or cognitive functioning. More specifically, the question might be asked as to the differential effects of learning upon perceptual and cognitive performance as considered in this study, and in what way such effects are related to the obtained results. Let us first re-examine the test instruments.

The three perceptual tasks (i.e., ISE, FRUW, VS_I) and the total VS procedure (perceptive-cognitive) do appear to be differentiated from the cognitive instruments (BA, OS, CW) on the basis of learning factors. The perceptual and VS_T tasks require S to attend to various stimulus elements, to dis-

criminate among them, and to respond to what has been perceived in a relatively short period of time. This may be seen as emphasizing perceptual learning while minimizing cognitive effects. However, the cognitive instruments permit S more freedom to interrelate the perceived stimulus elements and to conceptualize them according to various personal categorizing principles. In effect, S relies more upon cognitive function with conceptualization than upon rote learning procedures. In this sense, it would appear that learning factors tend to be operative to a greater extent in the perceptual and VS_T task behaviors than in the cognitive, and may account not only for the differentiation between the two types of tests (perceptual, cognitive) but for the interrelation of perceptual tasks as well as the relative lack of relation among cognitive tasks. In any event, perception and perceptual learning do appear to be complexly interrelated in the perceptual task behaviors.

It is also likely that other factors (e.g., attention deployment, memory, perseveration) might have been differentially involved in perceptual and cognitive performances; however, it appears to be just this type of condition that is involved in what King refers to as broadness-narrowness in "per-

ceptual style." Insofar as perception is concerned, it appears that the exploratory nature of this study coupled with arbitrary task selection has led to results that provide for the delineation of breadth phenomena as well as an illustration of King's hypothesis regarding the relationship of such phenomena to other forms of task behavior--i.e., learning.

Thus, it is believed that the present study, while not necessarily demonstrating a general concept of personality breadth, does lend support to theoretical consideration of perceptual breadth and cognitive breadth. It is also felt that some degree of clarification has been given to former postulates regarding broad perceptual and cognitive functioning and that a more parsimonious integration has been suggested in an area in which several diverse formulations have been previously advanced.

V. SUMMARY

The present study was designed to explore a number of varied behavioral tasks in search of evidence for a generic concept of personality breadth, as well as confirmation of perceptual or cognitive breadth. Two primary functions were emphasized in task selection--i.e., perception, cognition. Several test instruments were selected and discussed in terms of their primary eliciting functions (perceptual, cognitive, perceptive-cognitive) and the way in which each could be interpreted on the continuum of breadth. Six tests were sufficiently reliable to be included in the study. They are: Pettigrew's Category Width Scale (cognitive); Clayton's modification of Gardner's Object Sorting task (cognitive); Sloane's Blot Association test (cognitive); and, three tasks developed by King--i.e., Identification of Stimulus Elements (perceptual), Free Recall of Unrelated Words (perceptual), Visual Scanning (perceptive-cognitive).

Intercorrelational analysis indicated an apparent lack of relationship between cognitive and perceptual tasks as groups. Consequently, support was lacking for the formulation of a general unitary concept of personality breadth. However, several additional relationships relevant to conceptions

of cognitive and perceptual breadth continua suggest plausible alternatives to the "generic hypothesis."

Results tended to support formulations concerning perceptual breadth sufficiently to warrant further investigation of this concept. Learning factors involved in perceptual performance were discussed and related to obtained relationships.

Results regarding cognitive performance were also sufficient to encourage the modification of methodological discrepancies in future investigations.

Additional relationships between the perceptual and cognitive tasks and a general measure of intelligence (College Qualification Test) were also investigated. Results here indicated that intelligence and perceptual breadth may be to some extent related and suggested further implications for perceptual research.

VI. REFERENCES

1. Beck, S. J. Rorschach's test I: basic processes. New York: Grune & Stratton, 1950.
2. Bruner, J. S., Goodnow, J. J. & Austin, G. A. A study of thinking. New York: Wiley, 1960.
3. Cameron, N. Schizophrenic thinking in a problem-solving situation. J. ment. Sci., 1939, 85, 1012-1035.
4. Cameron, N. Perceptual organization and behavior pathology. In R. R. Blake & G. V. Ramsey (Eds.), Perception: an approach to personality. New York: Ronald, 1951. Pp. 283-306.
5. Clayton, Martha. Equivalence range and the tendency to endorse absolute statements. Unpublished master's thesis, Pennsylvania State Univer., 1959.
6. Epstein, S. Overinclusive thinking in a schizophrenic and a control group. J. consult. Psychol., 1953, 17, 384-388.
7. Gardner, R. W. Cognitive styles in categorizing behavior. J. Pers., 1954, 22, 214-233.
8. Gardner, R. W., Holzman, P. S., Klein, G. S., Linton, H. & Spence, D. P. Cognitive control: a study of individual consistencies in cognitive behavior. Psychol. Issues, 1959, 1, (Monograph 4).
9. Gruen, W. Behavioral correlates of some dimensions of the cognitive field. J. Pers., 1959, 27, 169-186.
10. Guilford, J. P. Fundamental statistics in psychology and education. New York: McGraw-Hill, 1956.
11. Holzman, P. S. & Klein, G. S. Cognitive system-principles of leveling and sharpening: individual differences in assimilative effects in visual time-error. J. Psychol., 1954, 37, 105-122.
12. King, G. F. Personal communication, 1960.

13. Klein, G. S. The personal world through perception. In R. R. Blake & G. V. Ramsey (Eds.), Perception: an approach to personality. New York: Ronald, 1951. Pp. 328-355.
14. Klein, G. S. Cognitive control and motivation. In G. Lindzey (Ed.), Assessment of human motives. New York: Rinehart, 1958. Pp. 87-118.
15. Klein, G. S. & Schlesinger, H. Where is the perceiver in perceptual theory? J. Pers., 1949, 18, 32-47.
16. MacKinnon, D. W. The structure of personality. In J. McV. Hunt (Ed.), Personality and the behavior disorders. New York: Ronald, 1944. Pp. 3-48.
17. Pettigrew, T. F. The measurement and correlates of category width as a cognitive variable. J. Pers., 1958, 26, 532-544.
18. Rokeach, M. A method for studying individual differences in "narrow-mindedness". J. Pers., 1951a, 20, 219-233.
19. Rokeach, M. "Narrow-mindedness" and personality. J. Pers., 1951b, 20, 234-251.
20. Schlesinger, H. J. Cognitive attitudes in relation to susceptibility to interference. J. Pers., 1954, 22, 354-374.
21. Sloane, H. N. Jr. The generality and construct validity of equivalence range. Unpublished doctoral dissertation, Pennsylvania State Univer., 1959.
22. Thorndike, E. L. & Lorge, I. The teacher's word book of 30,000 words. New York: Columbia Univer., 1944.
23. Tolman, E. C. Cognitive maps in rats and men. Psychol. Rev., 1948, 55, 189-208.

APPENDIX A
ESTIMATION QUESTIONNAIRE

35
Estimation Questionnaire

The following 20 items call for two estimates or judgments, one for Part a and one for Part b of each item. Indicate your estimate by circling the appropriate number. In every case, give what you consider to be the most accurate estimate. Be sure to answer every item.

1. It has been estimated that the average width of windows is 34 inches. What do you think:
 - a. is the width of the widest window ...

1. 1,363 inches	3. 48 inches
2. 341 inches	4. 81 inches
 - b. is the width of the narrowest window ...

1. 3 inches	3. 11 inches
2. 18 inches	4. 1 inch
2. Ornithologists tell us that the best guess of the average speed of birds in flight would be about 17 m.p.h. What do you think:
 - a. is the speed in flight of the fastest bird ...

1. 25 m.p.h.	3. 73 m.p.h.
2. 105 m.p.h.	4. 34 m.p.h.
 - b. is the speed in flight of the slowest bird ...

1. 10 m.p.h.	3. 12 m.p.h.
2. 2 m.p.h.	4. 5 m.p.h.
3. The average length of whales in the Atlantic Ocean has been estimated by zoologists to be roughly 65 feet. What do you think:
 - a. is the length of the longest whale in the Atlantic Ocean...

1. 120 ft.	3. 86 ft.
2. 190 ft.	4. 75 ft.
 - b. is the length of the shortest whale in the Atlantic Ocean..

1. 6 ft.	3. 52 ft.
2. 43 ft.	4. 21 ft.
4. Shipping authorities have calculated that the average weight of merchant ships registered with the U. S. Maritime Commission in 1946 was 5,705 tons. What do you think:
 - a. is the weight of the heaviest ship registered with the commission ...

1. 10,500 tons	3. 23,000 tons
2. 62,000 tons	4. 7,500 tons
 - b. is the weight of the lightest ship registered with the commission ...

1. 3,900 tons	3. 2,700 tons
2. 1,100 tons	4. 2 tons

5. Weather officials report that during this century Washington, D.C. has received an average rainfall of 41.1 inches annually. What do you think:
- is the largest amount of rain that Washington has received in a single year during this century ...

1. 82.4 inches	3. 63.7 inches
2. 45.8 inches	4. 51.2 inches
 - is the smallest amount of rain that Washington has received in a single year during this century ...

1. 20.2 inches	3. 9.9 inches
2. 36.3 inches	4. 29.7 inches
6. An average of 58 ships entered or left New York Harbor daily during the period from 1950 through 1955. What do you think:
- was the largest number of ships to enter or leave New York in a single day during this period ...

1. 69 ships	3. 76 ships
2. 153 ships	4. 102 ships
 - was the smallest number of ships to enter or leave New York in a single day during this period ...

1. 34 ships	3. 16 ships
2. 3 ships	4. 43 ships
7. For the past twenty years, Alaska's population has increased an average 3,210 people per year. What do you think:
- was the greatest increase in Alaska's population in a single year during these twenty years ...

1. 6,300	3. 3,900
2. 21,500	4. 4,800
 - was the smallest increase in Alaska's population in a single year during these twenty years ...

1. 470	3. 980
2. 1,960	4. 2,520
8. Boating experts estimate that the average speed of all sailing craft in America is around 4.1 knots. What do you think:
- is the speed of the fastest sailing boat in America ...

1. 8.2 knots	3. 5.9 knots
2. 30.7 knots	4. 21.3 knots
 - is the speed of the slowest sailing boat in America ...

1. 3.3 knots	3. 2.2 knots
2. 0.6 knots	4. 1.2 knots
9. Book review editors guess that around 300 new American novels have appeared annually since World War II. What do you think:
- is the largest number of novels to be published in America in a single year during this period ...

1. 380 novels	3. 870 novels
2. 495 novels	4. 620 novels

- b. is the smallest number of novels to be published in America in a single year during this period ...
- | | | | |
|----|------------|----|------------|
| 1. | 145 novels | 3. | 90 novels |
| 2. | 205 novels | 4. | 260 novels |
10. Between 1900 and 1940 there was an average of 48 lynchings per year in the United States. What do you think:
- a. was the largest number of lynchings in any one year during this period in the United States ...
- | | | | |
|----|----|----|-----|
| 1. | 79 | 3. | 53 |
| 2. | 63 | 4. | 135 |
- b. was the smallest number of lynchings in any one year during this period in the United States ...
- | | | | |
|----|----|----|----|
| 1. | 1 | 3. | 33 |
| 2. | 11 | 4. | 19 |
11. It has been calculated that the average time for all trains in 1953 from New York City to Washington, D.C. was 285 minutes (4 hours and 45 minutes). What do you think:
- a. was the time of the slowest train from New York City to Washington in 1953 ...
- | | | | |
|----|----------|----|----------|
| 1. | 337 min. | 3. | 396 min. |
| 2. | 304 min. | 4. | 483 min. |
- b. was the time of the fastest train from New York City to Washington in 1953 ...
- | | | | |
|----|----------|----|----------|
| 1. | 236 min. | 3. | 268 min. |
| 2. | 202 min. | 4. | 145 min. |
12. The average number of births in the world per day during 1955 has been computed to be 27,440. What do you think:
- a. was the largest number of births in the world in any one day during 1955 ...
- | | | | |
|----|--------|----|--------|
| 1. | 36,501 | 3. | 49,876 |
| 2. | 28,207 | 4. | 30,023 |
- b. was the smallest number of births in the world in any one day during 1955 ...
- | | | | |
|----|--------|----|--------|
| 1. | 26,340 | 3. | 14,330 |
| 2. | 24,725 | 4. | 19,704 |
13. When all of the world's written languages are considered, linguists tell us that the average number of verbs per language must be somewhere around 15,000. What do you think:
- a. is the largest number of verbs in any single language ...
- | | | | |
|----|--------|----|--------|
| 1. | 21,000 | 3. | 50,000 |
| 2. | 18,000 | 4. | 30,000 |
- b. is the smallest number of verbs in any single language ...
- | | | | |
|----|--------|----|--------|
| 1. | 1,000 | 3. | 5,000 |
| 2. | 13,000 | 4. | 10,000 |

14. The average muzzle to tail length of a sample of 1,000 German Shepherd dogs is 40.3 in. What do you think:
- is the length of the longest Shepherd dog in the sample ...
 - 60.4 inches
 - 47.8 inches
 - 44.1 inches
 - 54.2 inches
 - is the length of the shortest Shepherd dog in the sample ...
 - 34.6 inches
 - 28.4 inches
 - 19.7 inches
 - 36.9 inches
15. The average population of South American countries is approximately 8.6 million people each. What do you think:
- is the population of the most populated country in South America ...
 - 11.2 million
 - 54.7 million
 - 23.6 million
 - 129.1 million
 - is the population of the least populated country in South America ...
 - 7,000
 - 6.2 million
 - 2.4 million
 - 29,000
16. A Stanford University home economist has estimated that the average American spends around 55 minutes of his day eating. What do you think:
- is the longest eating time of any single American ...
 - 185 minutes
 - 125 minutes
 - 245 minutes
 - 90 minutes
 - is the shortest eating time of any single American ...
 - 16 minutes
 - 4 minutes
 - 38 minutes
 - 27 minutes
17. In 1946 the average number of births per state was 68,000. What do you think:
- was the highest number of births in a single state ...
 - 87,000
 - 122,000
 - 71,000
 - 254,000
 - was the lowest number of births in a single state ...
 - 29,000
 - 53,000
 - 14,000
 - 900
18. Immediately after World War II, the average number of submarines owned by the largest seven navies in the world was 58. What do you think:
- was the largest number of submarines owned by one of these navies ...
 - 159
 - 91
 - 118
 - 69
 - was the smallest number of submarines owned by one of these navies ...
 - 22
 - 9
 - 36
 - 47

19. The average number of churches per religious denomination in the United States is estimated to be 511. What do you think.
- a. is the largest number of churches of a single religious denomination in the U.S.A. ...

1.	4,833	3.	1,219
2.	757	4.	39,801
 - b. is the smallest number of churches of a single religious denomination in the U.S.A. ...

1.	313	3.	1
2.	146	4.	23
20. In the years 1916 through 1946, according to the U.S. Weather Bureau, there was an average of 140 tornadoes a year in the United States. What do you think:
- a. was the largest number of tornadoes in a single year in the United States during this period ...

1.	154	3.	312
2.	243	4.	197
 - b. was the smallest number of tornadoes in a single year in the United States during this period ...

1.	103	3.	61
2.	122	4.	28

APPENDIX B
OBJECT SORTING

41
Object Sorting I

First of all, I want you to know that there is no answer to this test. Everyone does it in his own way. I want you to do it in the way that seems most natural, most logical, and most comfortable to you. The instructions are simply to put together into groups the names of the objects listed below which seem to you to belong together. Write these groups down on the paper provided, labeling the categories A, B, etc. For example, in category A you would place those objects which seem to belong in one group, in category B those objects which seem to belong in a second group, and so on for as many or as few groups as you feel is necessary. You may have as many or as few objects in a group as you like, so long as the objects in each group belong together for one particular reason. However, no object may be placed in more than one group. If, after you have thought about all the objects, a few do not seem to belong with any of the others, you may put each of those objects into groups by themselves. So that you will be sure to sort all of the objects, it is suggested that you place a check mark next to each object when you place it in a category. Use a pencil with an eraser.

lamp post	hat	towel
television set	golf club	a watch
rock	picture	tree
hammer	wallet	postage stamp
ruler	spoon	chair
gloves	telephone	band aid
sweater	pillow	milk bottle cap
aspirin	rug	window shade
canoe	screw driver	a bolt
coat	measuring cup	shoe
pencil	cigarette	daffodil

book-end	⁴² radio	a baseball
lamp	a match	handkerchief
rope	dictionary	comb
a tire	a pot	tobaggan
pistol	nail scissors	dime
arrow	shovel	

43
Object Sorting II

First of all, I want you to know that there is no answer to this test. Everyone does it in his own way. I want you to do it in the way that seems most natural, most logical, and most comfortable to you. The instructions are simply to put together into groups the names of the objects listed below which seem to you to belong together. Write these groups down on the paper provided, labeling the categories A, B, etc. For example, in category A you would place those objects which seem to belong in one group, in category B those objects which seem to belong in a second group, and so on for as many or as few groups as you feel is necessary. You may have as many or as few objects in a group as you like, so long as the objects in each group belong together for one particular reason. However, no object may be placed in more than one group. If, after you have thought about all the objects, a few do not seem to belong with any of the others, you may put each of those objects into groups by themselves. So that you will be sure to sort all of the objects, it is suggested that you place a check mark next to each object when you place it in a category. Use a pencil with an eraser.

cap	baseball bat	nail file
paper weight	venetian blind	a hoe
tulip	mittens	a spear
fork	measuring spoon	pliers
penny	rifle	phonograph
a cork	a saw	stool
hair brush	cigar	wash cloth
clock	a football	photograph
cushion	sled	purse
lighter	shirt	fountain pen
vitamin pill	bush	string

tax stamp 44 yard stick slipper

movie projector adhesive tape carpet

pebble row boat inner tube

telegram telephone pole a screw

telephone directory a kleenex a pan

jacket a candle

APPENDIX C

FREE RECALL OF UNRELATED WORDS

Free Recall of Unrelated Words (FRUW)

(Turn to page 10 of the Inventory Booklet.) I am going to read you a list of words. Then I am through reading the list, I want you to write down on the mimeographed sheet as many words as you can recall. You will notice that the letters of the alphabet are arranged in two columns on the sheet. Write each word in the space by the letter with which it begins.

Understand?

Don't write any words down until I'm finished with the list. I will now read the words. Listen carefully!

(List 1: Read 2 seconds per word.)

Building	Dress
Talk	Yard
Heart	Fly
Job	Give
North	Usual
Ring	Enemy
Open	Idea
Music	

(Give ss 100 seconds to write down the recalled words for this list and all succeeding lists.)

(Turn to page 11 in the booklet.) Now again listen carefully as I'm going to read another list of words. Don't write down any words until I'm finished. Now Listen Carefully!

(List 2: Read 2 seconds per word.)

Deep	Harpen
Visit	Just
Power	Kitchen
Always	Young
Prain	Like
Soft	Night
Crowd	Boat
Question	

(Turn to page 12 in the booklet.) Listen carefully. I'm going to read another list. Listen carefully.

(List 3: Read 2 seconds per word.)

Reason	Enough
Forward	Heavy
Joy	Wonder
Animal	Lost
Office	Men
Purpose	Simple
Drink	Keep
Garden	

(Turn to page 13 in the booklet.) Now for the last list of words. Listen carefully.

(List 4: Read 2 seconds per word.)

Future	Million
Bird	Practice
Across	Important
West	Time
Shout	Result
Look	Human
Country	Early
Difference	

APPENDIX D
IDENTIFICATION OF STIMULUS
ELEMENTS TEST

Identification of Stimulus Elements (ISE) Test

Instructions and Procedure

Training Series. "I am going to show you some figures or designs. They were specially constructed so they may appear somewhat unusual or different. These figures have names which I would like you to learn. Look closely as I show you the figures one at a time. During the first presentation, I'll give you the names."

The figures are presented in the following order: CAX, HOG, LUD, BIV, JEN. The exposure time for each figure is 8 seconds. As E presents the first figure, he states: "This is C-A-X, cax." The same procedure is followed for the remaining four figures on the first trial.

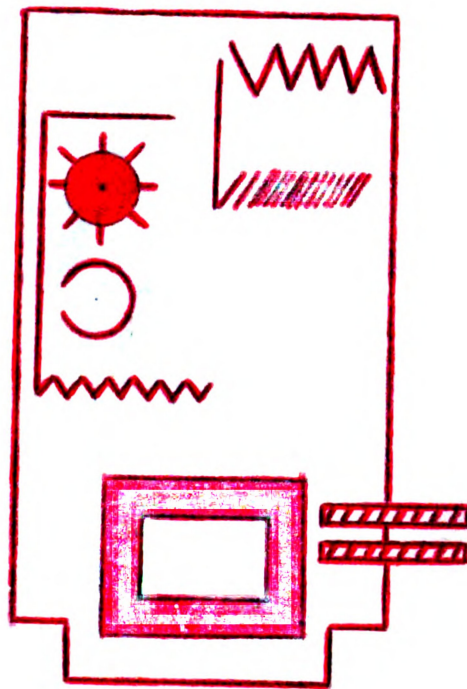
After the first trial, E shuffles the cards so they will be presented in a different order on the second trial. E then states: "Now I'm going to show the figures again. See if you can identify them. Hold up the correct card as soon as you recognize the figure. (S is provided with 5 cards with the syllables printed on them.) Remember, look at the figures closely." E gives the correct name after 8 seconds. Presentation time, as on the first trial, is 8 seconds per figure.

A total of six trials is given, with E shuffling the cards before each trial. Before each trial, E indicates the number of the trial. For example-- "This is the second trial." He also states: "Look at the figures closely."

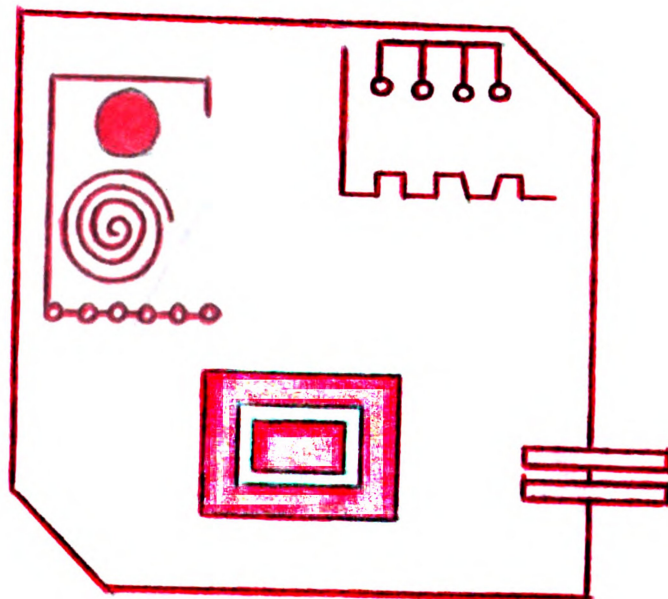
Before the seventh trial, E states: "Now continue to indicate the names of the figures by holding up the correct card. I want you to remember something else as you look at the figures. When we're all through, I'm going to ask you to draw each figure from memory. So again I say, 'Look at the figures closely.'" A total of 6 more trials are given under these conditions.

Test Series. "Instead of having you draw each figure, I'm going to show you some parts or elements of the figures that you've just learned. In other words, each of the drawings that you will now see belongs to one of the previous figures. I want you to name the figures from which these parts were taken. Use this answer sheet that I give you. If you're not sure, make a guess."

The 40 stimulus elements are individually presented (as numbered on the cards), the exposure time being 12 seconds for each stimulus element.



C A X



L U D

APPENDIX E
VISUAL SCANNING TEST

Visual Scanning (VS) Test

I. Simple Scanning and Recall

There are some words scattered about on the other side of this card. I'm going to let you look at this card for a short period of time, about a minute. Your task will be to find as many words as you can. When I take the card away, write down all the words that you remember seeing. Any questions? All right, now look at the card. (E holds Card I approximately 18 inches from S for 60 seconds. After the card is taken away, S records his responses, i.e., words, on a sheet of paper that is provided.)

Now here's another card with some different words scattered about on it. We'll do the same thing as before. Ready to look at the card? All right, here's the card. (E holds Card II approximately 18 inches from S for 60 seconds. After the card is taken away, S records his responses as before.)

Visual Scanning Words

Card I:

<u>Animal</u>	<u>Body of Water</u>	<u>Body Part</u>	<u>Clothing</u>
BEAR	BAY	ARM	BELT
CAT	GULF	EYE	BUTTON
COW	HARBOR	FACE	COAT
DOG	LAKE	HAND	COLLAR
GOAT	OCEAN	KNEE	HAT
HORSE	RIVER	LEG	SHIRT
LION	SEA	NOSE	SHOE
PIG	SPRING	NECK	SUIT
WOLF	STREAM	NOSE	TIE

<u>Landscape</u>	<u>Title</u>	<u>Furniture</u>
DESERT	CAPTAIN	BED
FIELD	CHIEF	BENCH
FOREST	COLONEL	CHAIR
HILL	GENERAL	CLOCK
MEADOW	GOVERNOR	DESK
MOUNTAIN	KING	LAMP
PLAIN	MASTER	RUG
SKY	OFFICER	STOVE
VALLEY	PRESIDENT	TABLE

Visual Scanning Words

Card II:

<u>Building Material</u>	<u>Color</u>	<u>Container</u>	<u>Weather</u>
BRICK	BLACK	BAG	CLEAR
GLASS	BLUE	BARREL	COLD
MARBLE	BROWN	BOTTLE	DRY
NAIL	GRAY	BOX	FAIR
ROOF	GREEN	CAN	HOT
SAND	PINK	CAGE	RAIN
STEEL	RED	JAR	SNOW
STONE	WHITE	PACKAGE	HARM
WOOD	YELLOW	TUBE	WIND

<u>Food</u>	<u>House Part</u>	<u>Time</u>
BREAD	DOOR	CENTURY
BUTTER	FLOOR	DAY
COFFEE	HALL	FOUR
EGG	KITCHEN	MINUTE
FRUIT	PORCH	MOMENT
MEAT	ROOF	MONTH
MILK	STAIR	SECOND
POTATO	HALL	WEEK
SUGAR	WINDOW	YEAR

APPENDIX F
VS POST-TEST INQUIRY

Name _____

VS Test

I. Post-Test Inquiry

1. Indicate how you approached the test on the first card that was shown to you (Circle appropriate letter):
 - a. Concentrated on the words on one part of the card or in a certain area.
 - b. Scanned most of the card picking up words from a relatively wide area.
 - c. Concentrated on words of a similar nature or of the same category, like all animals or all parts of the body.
 - d. An approach other than the above. Describe this approach briefly. _____
 - e. Some combination of the above approaches. Briefly indicate the combination. _____
2. Did you change your approach on the second card? (Circle a or b.)
 - a. Yes
 - b. No

If answer was "yes", briefly describe the change.

APPENDIX G
BLOT ASSOCIATION TEST

Blot Association Test

Instructions. You have been given ten cards and two sheets of paper. Each card has a different inkblot on it. Listed on the two sheets of paper (including this one) are a number of possible answers for each blot. Now look closely at Blot I and then look at the possible answers that are given for Blot I. Check (X) all those answers which resemble or remind you of Blot I. Now look at Blot II and the answers that are given for it. Do the same thing. Then continue with the rest of the blots.

Blot I

☐ airplane	☐ wasp	☐ vocal cords	☐ nervous system
☐ leaf	☐ mask	☐ prize fighters	☐ bus
☐ sponge	☐ coat of arms	☐ toys	☐ sea animal
☐ bat	☐ rock formation	☐ tooth	☐ insect
☐ tree	☐ flower	☐ devils	☐ primitive painting

Blot II

Blot III

☐ pelvis	☐ grasshopper	☐ animal skin	☐ jellyfish
☐ nap	☐ fly	☐ tree	☐ are
☐ gorilla	☐ internal organs	☐ crab	☐ butterfly
☐ picture puzzle	☐ modernistic painting	☐ eagle	☐ elephant
☐ spider	☐ brain section	☐ ant head	☐ coral

Blot IV

Blot V

___ hide ___ bat
 ___ bridge ___ nap
 ___ cow's head ___ bee
 ___ deer ___ airplane
 ___ beetle ___ flattened
 ___ insect

Blot VI

___ door ___ guitar
 ___ church ___ bat
 ___ turtle ___ crown
 ___ fan ___ Australia
 ___ fox ___ animal
 ___ skin

Blot VII

___ two women ___ fingers
 ___ clouds ___ harbor on
 ___ relief map
 ___ frog ___ coat of arms
 ___ mouth of ___ fried shrimp
 cave
 ___ wig ___ shrubs

Blot VIII

___ Greenland ___ shield
 ___ coat of arms ___ bat
 ___ ornament ___ basket
 ___ pelvis ___ statue
 ___ sailing ship ___ Egyptian
 pyramid

Blot IX

___ fountain ___ cross sec-
 tion of
 brain
 ___ women in ___ dragonfly
 costume of ___
 1890's
 ___ crab shell ___ decorative
 piece
 ___ explosion ___ skull
 ___ connected ___ mask
 islands

Blot X

___ cobwebs ___ dance of
 life
 ___ tool like ___ biological
 pliers slide
 ___ dream jum- ___ oriental
 ble pagoda
 ___ ocean bottom ___ chandelier
 ___ butterfly ___ Chinese alpha-
 betical charac-
 ters

1000 1000

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