

PERSONALITY PROJECTION THROUGH
PICTURE INTERPRETATION AS A FUNCTION
OF PHYSICAL AND SITUATIONAL AMBIGUITY

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THESIS

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PERSONALITY PROJECTION THROUGH PICTURE
INTERPRETATION AS A FUNCTION OF
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AMBIGUITY

By
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ABSTRACT

This study was designed to evaluate the contribution of physical ambiguity, situational ambiguity, theme type, and marital status to the productivity of picture type projection tests. Three levels of physical ambiguity, four levels of situational ambiguity (levels of overttness), and two theme types (sex and hostility) were employed. A complex analysis of variance design permitted examination of the variable interactions.

Productivity was measured in terms of number of words elicited, transcendancy scores, and amount of projection as determined by the clinical judgment method. Analysis of the words and projection data revealed that neither measure produced significant differences with respect to any of the variables. The transcendancy data did, however, produce numerous differences as are indicated in the conclusions which follow.

Physical ambiguity. The classical position states that the role played by internal and social factors decreases with the stability, clarity, or structuredness of the stimulus. Earlier studies appeared to refute this position as it was found that an increase in the physical structure of the stimulus resulted in an increase in the amount of

fantasy elicited. The results of the present study fail to support either position, as no differences were found with respect to physical ambiguity.

Situational ambiguity. The sexual stimulus depicting the least amount of "overttness" was found to produce significantly higher transcendancy scores than more "overt" sexual stimuli. No differences, with respect to this variable, were found within the hostility continuum.

Theme type. Type of theme contributed jointly with other variables to produce numerous significant interactions. The most meaningful of these interactions involved marital status, and will be discussed under that heading.

Marital status. The data revealed that married subjects received higher transcendancy scores to hostility stimuli than sex stimuli. It was also determined that married subjects reacted in accordance with the theme type depicted; that is, with sexual stories to sexual stimuli, etc. Unmarried subjects, on the contrary, received significantly higher transcendancy scores to sex stimuli than hostility stimuli, and gave a significant number of hostility stories to sexual stimuli.

It is not felt that the findings presented above support the contention that projection stimuli need only be physically ambiguous to be productive. On the contrary, it appears that this variable has little if any relationship with productivity. Situational ambiguity seems to be a more critical variable and one worthy of further systematic investigation.

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INTRODUCTION

Contemporary formulations and scientific procedures have led us to new methods of investigating the personality process as a dynamic operation, revealing the individual's unique way of organizing and interpreting experience.

In Frank's (15) words:

The personality process involves a selective awareness of all situations, as patterned by the prior experience of the individual who has been sensitized or rendered more or less anesthetic, so that he sees, hears, and otherwise perceives what has become relevant and meaningful to him and ignores and rejects all else. The process operates also in the individual's peculiar personal way of fitting whatever he has selectively perceived into the more or less unique pattern, configuration, or organization of his private world, of interpreting and defending it and dealing with it, always according to its meaning and emotional significance for him.

The problem we face is much like that in the study of the organization of an atom. We cannot directly observe, but must infer the operations of the personality process from a variety of observations, showing the dynamic way in which this process acts upon all experience.

From this frame of reference it was inevitable that what we now call projective tests came into being. Basically, these projective techniques are methods of studying the personality by confronting the

subject with a situation to which he will respond according to what that situation means to him and how he feels when so responding. It is then a method concerned with the idiomatic expression or response of the individual.

Concomitant with the rapid growth and broad use of these tools has come an awareness of their fallibility as predictive devices (27). Valid criticisms have been voiced concerning their validity, reliability (10), and more vitally with reference to their underlying assumptions (2, 8, 21, 22, 25, 33, 34, 38).

Of the multitude of notions basic to the projective tests now enjoying wide use, the concept of ambiguity seems most salient. Simply stated, it is assumed that a subject, when presented with an ambiguous stimulus or stimulus complex, will react to this stimulus in accordance with his unique dispositions. It is further assumed that the more ambiguous this stimulus complex the less the card itself plays a part in determining the response and consequently the more the personal aspect takes precedent. This has been called the "stimulus fallacy" by L. L. Thurstone (41). Thurstone expressed the view that a subject creates his own stimuli to which he then responds in characteristic manner; hence a stimulus situation, no matter how well controlled, does not always mean what the tester intends. This idea has been concisely expressed by Sherif and Cantril (38, p. 47): ". . .

all other things being equal, the role played by internal and social factors decreases with the stability, clarity, or structuredness of the stimulus situation and with the strength of frames or points of reference already established."

Bellak (3), one of the more prominent persons in projective psychology, stated that:

Projection will vary in amount inversely with the clearness of the stimulus. Concepts of the Gestalt school permit one to express this situation rather well. One may say in those terms that the less structured the field is originally, the more structuring will be done by the ego and visa versa. In an ambiguous picture, personality variables will determine mainly what becomes figure and what becomes ground.

Sargent (35) and Murray (31) are also adherents of this position.

In contrast to these positions, Frank (15) seems to have implied that the stimulus itself is not of paramount importance as the personality process involves a selective awareness of all situations as patterned by prior experience. His statement that "the individual perceives what has become relevant and meaningful to him while rejecting and ignoring all else" appears to underly the position held by Bruner and Postman (7, 8). These writers asserted that it is not at all necessary to use unstructured stimuli to elicit personalistic material as all stimulus situations are potentially equivocal. These

stimulus situations cease being equivocal only to the extent that personal selection, accentuation, and fixation take place.

Attempts to measure ambiguity and its effects have pointed up the definitional difficulties of the concept. Weiskopf (45) has defined it in terms of its physical properties, Bellak (3) on the basis of group judgments, and Murray (31) on the basis of both of the above views. Bijou and Kenny (5) stated:

Variation of some physical property of the card would not necessarily mean that it would be perceived as vaguer or clearer in its import. Physical ambiguity may not be the same as psychological ambiguity; in fact, there seems to be no reason to expect an isomorphic relationship between the two.

Previous Research

In the instructions to their subjects, Bijou and Kenny (4) defined ambiguity of the stimulus complex as "that which is open to a number of possible interpretations." Having the subjects rank the Thematic Apperception Test cards on this basis, they found: (a) that there were no significant differences between male and female even though the cards ranked were for male use, and (b) that Murray's division of cards 1-10 and 11-21 on the basis of being less and more ambiguous, respectively, is called into doubt. In a second experiment (20), the authors found further (c) no significant differences in the number of words elicited to Thematic Apperception Test stimuli of

three levels of 'psychological' ambiguity; and (d) that the cards judged to be of medium ambiguity revealed significantly more personality material than did either the low or high ambiguity cards. Rearranging the cards in Murray's original order of ambiguity, it was found that his most ambiguous cards did not elicit more significant personality material than did the least ambiguous cards.

In line with the Bijou and Kenny definition of ambiguity, Tompkins (42) found that numerous administrations of the Thematic Apperception Test are necessary to elicit all of the significant themes for one person. Tompkins found further that some cards consistently produce a greater number of different themes. The method used in presenting the data for this study precluded the possibility of examining the relationship between ambiguity and productivity.

The role of psychological or situational ambiguity has been emphasized by Bellak (3). He stated: "While it holds true that there is more projection--and less adaptation--if the stimulus is not well defined, a stimulus more suggestive of aggression will allow it to be projected more easily than one not suggestive of aggression at all."

Eron (12) and Wittenborn (47) drew similar conclusions expounding that the emotional tone and type of story elicited is a function of the stimulus properties of the cards. Both of these writers

and Palmer (32) found, however, that the idiosyncratic contribution of the story-teller is clearly identifiable from card to card.

It is readily apparent that no uniformity of opinion exists with respect to the continuum of psychological ambiguity or to the role played by the physical structure or clarity of the picture stimulus.

Using colored modifications of the Thematic Apperception Test and Thompson Thematic Apperception Test cards, Thompson and Backrach (40) tested and compared the productivity of regular cards and the colored modifications in terms of number of words elicited and dynamic content. They found essentially that the chromatic series produced significantly greater numbers of words than did the achromatic series, but that dynamic content was not significantly different for any of the personality variables tested. Brackbill (6), however, found a number of differences using chromatic versus achromatic Thematic Apperception Test cards. Employing both normal and neurotic groups, he found: (a) neurotics told more depressed stories to chromatic than to achromatic cards; (b) normals displayed no change in number of depressed stories, but did show a significant reduction of intellectual and destructive stories to chromatic cards; (c) neurotics had significantly longer reaction times to chromatic cards; and (d) the number of words increased with the use of color in the neurotic group. The results of these studies would not seem to support the role

traditionally attributed to ambiguity in projective tests; however, only limited inferences can be drawn, since in each of the above cases the increase in structure concerned a single step or factor.

Weiskopf (45) performed one of the few studies on the relationship of the stimulus and apperceptive response when she investigated the degree of fantasy elicited by Thematic Apperception Test pictures as a function of stimulus brightness and ambiguity. The amount of fantasy elicited was measured by "transcendence indices" (44) which were defined in terms of the mean number of responses "which go beyond pure description." There were three experiments. In the first, stimulus ambiguity was varied in terms of intensity or brightness. The results indicated there was no significant difference between amount of fantasy elicited by pictures presented under conditions of reduced and of normal brightness. In the second experiment, stimulus ambiguity was varied by presenting complete and incomplete tracings of a set of Thematic Apperception Test pictures. She found that the more structured pictures (i.e., those with complete tracings) evoked significantly more fantasy material. In a third experiment, stimulus ambiguity was varied in terms of exposure time, one set being exposed for 0.2 second, and the other for 5 seconds. The pictures exposed for the longer period elicited significantly higher fantasy scores.

Beginning where Weiskopf terminated--that is, with the original Thematic Apperception Test cards--Bingham (5) investigated the upper end of the ambiguity continuum. Five levels of physical ambiguity were compared. Ten of the original Murray Thematic Apperception Test cards were compared with black and white, color, three-dimensional black and white, and three-dimensional color reproductions. All of the reproductions involved the use of photographed live models. The use of color and/or three dimensions significantly increased the level of projective productivity at or beyond the 0.05 level of confidence.

Evidence from these studies, therefore, seems to indicate that stimulus ambiguity, defined in terms of physical properties, does not appear to be inversely related to amount of fantasy production. These findings may be used to evaluate the propositions under consideration provided one assumes that (a) stimulus ambiguity is properly defined in terms of physical properties, and (b) there is a direct relationship between amount of fantasy and amount of personality factors involved.

Bijou and Kenny (4) asserted strongly that these two assumptions are of questionable merit. They felt (a) that the ambiguity dimension should be defined in terms of responses rather than some physical property of the picture, and (b) that amount of fantasy elicited

tells us little about the amount of true personality projection involved. The views of these two experimenters represent the core of criticisms leveled at the Weiskopf findings. In view of Bingham's work, however, these criticisms seem less noteworthy. He employed as measurements not only the highly objective word count, but also rather extensive judgments by sixteen clinicians. The judges found the more highly structured cards (in physical terms) to be significantly more productive in terms of amount of projection.

In order to provide additional information on this problem, physical ambiguity is varied in this investigation.

On re-examination of Bingham's raw data, some interesting trends were noted which tend to support the contention of "psychological" or "situational" ambiguity as proposed by Bijou and Kenny. It seemed undeniable that increasing the physical structure of the stimulus--that is, making it as realistic as possible--increases the amount of projection elicited from each card. It appears, however, that the cards themselves, irrespective of amount of physical structure, have rather clearly defined levels of productivity. This factor is supported by the Bijou and Kenny (20) findings. Sharp differences were also found between the two sets of data which are probably a function of the methods of measurement. Bijou and Kenny, it is to be recalled, used the subject's evaluation of the "number of possible

interpretations" a card offered, and Bingham used the amount of projection elicited.

The fact that the various cards apparently have differential levels of productivity will, however, possess little scientific meaning until we are able to reveal the specific variables underlying this differential effect.

The re-examination of Bingham's data also revealed that the theme type in itself possibly is vital for productivity. The bulk of the content elicited by a given card may refer to a particular area of behavior. The nature of this content defines the "theme type" of the card. For example, cards having a male and female of comparable ages commonly elicit stories of heterosexual relationship. Suggestions were noted in Bingham's data that cards depicting a sexual or hostility relationship revealed more about the subject's personality picture in these behavioral areas than did cards depicting other relationships. Consequently these two theme types, hostility and sexuality, are to be stressed in this experiment.

Complicating these trends were indications that the amount of action displayed in the stimulus had a bearing on the productivity of the card. For example, a group of sexual cards, although intrinsically more productive than other types, appeared to have different levels of productivity. Inspection of the data seemed to indicate that

these differences could possibly be attributed to situational ambiguity¹ of the card; that is, the amount of action displayed in it. It also appeared that this relationship differed with respect to the type of theme being examined. In order to obtain more conclusive evidence on this problem, situational ambiguity is varied in this experiment.

A further complication arose with respect to possible inter-relationships between type of theme, situational ambiguity, and physical ambiguity.

The indications discussed above would, of course, support the Bijou and Kenny contention that we are actually dealing with two continua; one physical, and one psychological.

A broadly accepted clinical assumption closely aligned with the projective hypothesis states that gratified needs may not manifest themselves in responses to projective stimuli. It would seem to follow, then, that the amount of projection elicited to sexual stimuli should be less for a married individual than for an unmarried person in view of the opportunities for gratification. A test of this is included in the design of the present study.

¹ The term "situational" ambiguity refers to the amount of overtness or action depicted in a stimulus complex. This differs markedly from the concept of physical ambiguity which is defined in terms of adding physical factors to the stimulus complex to increase its physical clarity.

In summary, the variables under investigation in this study are: (a) physical ambiguity, (b) situational ambiguity, (c) theme type, and (d) marital status.

HYPOTHESES

The clinical implications of the findings thus far discussed are both broad and disruptive with respect to our commonly used projective tools. Only the most elemental type of generalization is necessary to see why, for example, the Rorschach test is under constant attack and why research on it offers such a wide variety of validity and reliability coefficients. Considering solely the continuum of physical properties of picture stimuli, we find as one progresses from the highly structured (5) to the highly unstructured (45) we are rewarded with progressively less projective material. That the Rorschach blots are less structured than the unmistakable human outlines used by Weiskopf can scarcely be questioned. It seems just as unfeasible to assume that suddenly the almost flawless empirical progression of reduced productivity should reverse itself and offer us the true personality core as has been so often stated.

The physical aspects of this type stimuli have been rather thoroughly investigated. Numerous questions remain, however, and rather extensive research appears called for. For example, it is important to know (a) whether certain types of picture stimuli are intrinsically (2) more productive; (b) whether the level of situational

ambiguity depicted in the stimulus (3) has a bearing on the amount of personality material elicited; (c) whether there are interrelationships between the amount of action, type of theme, and physical ambiguity of the stimulus; (d) whether the number of words and/or transcendancy indexes are related to the amount of projection (in terms of clinical judgments) forthcoming; and (e) whether these measurements differ between married and unmarried individuals.

Answers to the above questions would offer the requisites for devising projective tools on a rational rather than trial-and-error basis. Little need be said concerning the great demand for soundly derived clinical instruments with high predictive ability (10, 24, 29).

As an approach to a study of variables involved in this type of projective tool, the following null hypotheses are suggested for empirical test:

1. Productivity of a picture type projective test is not significantly increased or decreased as the physical ambiguity of the stimulus complex increases or decreases.

2. Productivity of sexual pictures is not significantly different from pictures depicting hostility.

3. Productivity of a picture type projective test does not vary significantly for stimuli depicting different levels of situational ambiguity in sexual stimuli.

4. Productivity of a picture type projective test does not vary significantly for stimuli depicting different levels of situational ambiguity in hostility stimuli.

5. There are no significant differences between married and unmarried subjects with respect to any of the above hypotheses.

6. There are no significant interactions between the primary variables.

7. The number of words elicited in responses to the various types of projective stimuli is not significantly related to the amount of projection in terms of clinical judgments or to transcendency scores.

Productivity is measured by: (a) number of words elicited, (b) Weiskopf's "transcendancy indices," and (c) amount of projection as determined by the clinical judgment method.

The amount of situational ambiguity present in the stimuli is determined by the judgment method described in the methodology section.

METHODOLOGY

Selection of Stimuli

As previously stated, this study is confined to the investigation of two major theme types, sex and hostility. These theme types were selected on the basis of having had greater personalistic response variability in earlier studies (4, 5).

It was also noted in these earlier efforts that the level of situational ambiguity depicted in the stimulus might be a factor contributing to the differential productivity of a particular pictorial stimulus. For example, pictures eliciting greater response variation with a hostility setting were those in which the action was seemingly implicit rather than overt; that is, when a person in the picture is obviously being restrained or assaulted, the responses appeared to be stereotyped picture descriptions and revealed little about the subject. Some indications were noted that the reverse may be true with respect to sexual stimuli, although the data available on this point were severely limited.

Trends were also discovered suggesting that interrelationships between productivity and the three experimental variables¹ may exist

¹ Theme type, situational ambiguity, and physical ambiguity.

and necessarily must be accounted for in this experimental design.

Four pictures of increasing situational ambiguity were chosen for each of the two themes. The procedure for the selection of the sex stimuli is as follows. Twelve scenes, all involving a male and female of comparable ages, were photographed in color. An attempt was made to make these photographs progressively more graphic with respect to the sexual relationship, while remaining within the confines of professional propriety. The scenes are:

1. A man and woman sitting side by side on doorstep. Both soberly looking straight ahead.
2. A man and woman sitting on grass. Woman holding flower and looking at it with bowed head. Male with weed in his mouth and propped up on one elbow.
3. Woman sitting at small table looking back over her shoulder at male. Male with pipe in his mouth.
4. Couple viewed from rear walking arm in arm. Female looking up at male.
5. Couple lying face down and side by side on grass. Photographed from rear and well above models.
6. Female on back. Male face down. Lying at angle so only shoulders and chests touch.

7. Woman in shorts walking by male. Male standing arms akimbo and watching woman.

8. Woman holding man's arms. Male turning away.

9. Male and female embracing in rear of automobile. Photographed through auto window so that only side of woman's face and back of man's head are shown.

10. Woman and man lying on the grass. Woman face up and male face down. Only heads and shoulders visible. Woman with half smile on her face. Only back of man's head shown.

11. Card 13 MF of Thematic Apperception Test. Woman lying in bed with breasts exposed. Male standing facing camera with forearm covering his eyes.

12. Male's bare back and rear of head shown. Woman's arm holding male tightly. Woman with painted nails.

The procedure employed for the initial selection of the hostility stimuli is identical to that used for the sexual stimuli with the exception of the use of two males in each picture. The twelve scenes are photographed as follows:

1. Two men walking side by side, looking at each other.
2. Two men close up. One profile and one facing camera.
3. Two men standing with arms akimbo, looking sternly at each other.

4. One male facing another. One with hand on other's shoulder.
5. One male sternly pointing finger at another.
6. One male lying on couch. Another standing over him with outstretched hand.
7. Male running rapidly after another.
8. Man clenching front of another's shirt.
9. Man twisting arm of another.
10. Front view of male being held by three hands.
11. Man striking another from behind with a heavy stick.
12. Man lying on ground with another standing over him in process of kicking his head.

These twelve hostility pictures and the twelve sexual pictures were rated by thirty judges. Half of the judges rated the sexual stimuli first, and half rated the hostility pictures first.

The instructions for the hostility pictures were typed at the top of the rating sheet and are as follows:

You will be shown 12 photographs all of which contain two males.

The purpose of this experiment is to determine the level of overtness of the hostility relationship shown in these photographs. In other words, we want to know which photographs show less and more clearly a hostility relationship.

Please restrict your judgment to what is actually present in the photograph, that is, to what the figures are actually doing.

Below you will see a scale numbered 1 to 9 with appropriate descriptive words for some of the numbers. You are to assign each picture a numerical score indicating the amount of hostility you feel is present in each picture.

Begin by looking over all the pictures. Following this, select any one and assign it a score in the space provided below in accordance with the letter on the back of the photograph. Continue until you have judged each picture.

Few alterations were made in the instructions for the judging of the sexual stimuli. The word "sexual" replaced the word "hostility" wherever relevant, and the initial sentence pointed out the fact that all the photographs contained a male and a female.

From these judgment data medians were computed for each picture. Those pictures with the highest and lowest medians for each theme type were selected for use in the experiment proper. The stimuli representing intermediate degrees of situational ambiguity were taken so as to be nearly equidistant from the high and low stimuli and from each other. The results of this matching procedure can be seen in Table I. The pictures selected appear in Appendix A.

Black-and-white reproductions of the four chromatic sex stimuli and the four chromatic hostility stimuli were made using standard photographic techniques.

These pictures were again reproduced using the Weiskopf (45) outline drawing method,¹ thereby affording the last of the three levels of physical ambiguity.

¹ Drawings were done by a commercial artist.

TABLE I

SCALE VALUES FOR LEVEL OF SITUATIONAL AMBIGUITY
DEPICTED IN THE SEXUAL AND HOSTILITY PICTURES

	Sex Medians	Diff.		Hostility Medians	Diff.
1.	1.3		1.	1.2	
		2.3			2.4
2.	3.6		2.	3.6	
		2.3			2.4
3.	5.9		3.	6.0	
		2.4			2.4
4.	8.3		4.	8.4	

Procedure and Experimental Design

The experimental procedure proper can be illustrated by the following example. Sex stimulus 'A,' which represents a sexual relationship with the greatest amount of situational ambiguity, is in three forms--chromatic photograph, achromatic photograph, and outline drawing. Three randomly assigned married and three randomly assigned unmarried undergraduate students were shown copies of sex card 'A' in color and asked to write a story about it. Three married and three unmarried subjects were shown sex card 'A' in black and white, and the same procedure was followed with 'A' card in outline form. This procedure was used with each of the eight basic pictures, making a total of twenty-four groups and 144 subjects.

Table II shows the rather complicated design in graphic form.

Group administration¹ with standard Thematic Apperception Test instructions were used throughout the experiment. When the subjects were seated in the testing situation they were asked to indicate their age and sex in the space provided at the top of the sheet. They were told specifically not to include their name, since their

¹ Eron and Ritter (13) have found slight differences between oral and written type administrations but not of sufficient magnitude to preclude the use of the written method.

TABLE II
EXPERIMENTAL DESIGN

Stimuli	Situational Ambiguity	Physical Ambiguity	Married S	Unmarried S
Sexual . . .	A	1*	3	3
		2	3	3
		3	3	3
	B	1	3	3
		2	3	3
		3	3	3
	C	1	3	3
		2	3	3
		3	3	3
	D	1	3	3
		2	3	3
		3	3	3
Hostility . .	A	1	3	3
		2	3	3
		3	3	3
	B	1	3	3
		2	3	3
		3	3	3
	C	1	3	3
		2	3	3
		3	3	3
	D	1	3	3
		2	3	3
		3	3	3
Total			72	72

* 1 = chromatic stimulus; 2 = achromatic reproduction; 3 = out-line reproduction.

df = 143.

identity had no bearing on the experimental problem.¹ The subjects were then asked to read the instructions carefully and to proceed using the stimulus clipped to the instruction sheet. An occasional subject completed his writing in five minutes; however, the average time was approximately nine minutes.

Subjects

All subjects in both groups were undergraduates.

The seventy-two unmarried subjects employed in this study were randomly drawn from beginning psychology and sociology courses during the summer term. As is apparent in Table III, the mean, range, and standard deviation of their ages is considerably greater than would be expected for a sample drawn during the regular academic year.

The sample of seventy-two married individuals was drawn randomly from the married housing files.

Fisher t tests of the difference between mean ages of the groups indicate that they differ significantly beyond the 0.01 level of confidence, the married group being older.

¹ Weiskopf (46), Joel (18), and Kannenberg (19) have done studies emphasizing the necessity of using highly standardized and impersonal instructions and conditions of administration.

TABLE III
AGE DATA FOR MARRIED AND UNMARRIED SUBJECTS

Item	Group	
	Married	Unmarried
N	72	72
Male	55	50
Female	17	22
M	24.76	22.72
Range	19-36	17-36
σ	3.49	2.93
t	3.96	p = 0.01

Measurements

Word count. The experimenter and two other persons counted the words for each of the 144 stories and recorded the count independently. Comparisons of the data sheets were made and all disagreements resolved by recount.

Ratings of projection. Four advanced doctoral candidates in clinical psychology acted as judges. Each judge rated each of the 144 stories using a nine-point scale. The original stories were typed, coded, and placed in their respective letter groups. Particular effort was made to duplicate each story exactly with respect to misspelling, spacing, word omissions, and striking over.

In accordance with the suggestions offered by Frenkle-Brunswik (16), the following instructions were given the judges:

The following protocols were taken from picture type stimuli administered to groups under three different experimental procedures. One group of subjects was shown the color photograph attached and the other groups with modifications of it. By expert clinical judgment we hope to determine which experimental procedure is more productive with respect to the amount of projection displayed. All the stories you are asked to evaluate in this section were given to the attached card or modifications of it. In this case stimulus A.

All of the subject's misspellings, mark outs, word substitutions and grammatical imperfections have been included.

Projection will be defined as "the effects of motivation, needs and organizational properties on perception.

Below you will see a scale numbered 1 to 9 with appropriate descriptive words for some of the numbers. You are to

assign each picture a numerical score indicating the amount of projection you feel is present in each picture.

The ratings of judges 1 and 2 were summed and compared with the summed judgments of judges 3 and 4, yielding a Pearson product-moment coefficient of +0.72. The t-test of significance of this coefficient reveals it to be significant beyond the 0.001 level of confidence ($t = 12.02$). The four ratings then were summed to provide the measurement of projection used in the analysis.

Transcendancy index scoring. The transcendancy index was originated by Weiskopf (44) as a more objective means of evaluating the amount of personalistic material elicited from picture type stimuli. A detailed description of the scoring categories may be found in Appendix B. Briefly stated, this index counts the responses which are not descriptions of the physical attributes of the stimulus. This includes description of emotions, thoughts and desires, inclusion of events and persons not shown, relationships, demands, personal evaluations, statements on abilities, and the psychological condition.

A fellow doctoral candidate and the experimenter scored each of the 144 stories independently. Following the scoring of the stories to "A" and "B" stimuli, however, the two scorers jointly rescored these sections of data in an attempt to better familiarize themselves with the method. Only minor disagreements were found between the

independent and joint scoring methods. The original independent scorings were used in the calculation of the Pearson product-moment coefficient. The independent scoring for the total data affords a coefficient of +0.97. The t-test reveals this coefficient to be significant beyond the 0.001 level of confidence ($t = 36.78$).

Treatment of Data

The appropriate method of analysis for a design of this type is that provided by the method of complex analysis of variance (28, p. 289). This design has the virtue of permitting the analysis of relationships that would be confounded in other designs.

The data, being measured independently by three different methods, require that this analysis be computed separately for each type of measurement. The t-test of significance for mean differences was computed whenever called for.

Calculations were made for each analysis to determine whether the assumption of homogeneity of variance (11, p. 296) was justified. In each case the assumption appeared to be warranted.

Pearson product-moment correlations were calculated to determine the relationships between number of words, amount of projection, and the transcendancy index scores.

Considering solely the ratings of projection or transcendency scores as indicators of the amount of productivity present in each story would leave much to be desired. For example, were it determined that sex stimuli having a high level of situational ambiguity produced significantly more personalistic material, numerous questions would remain unanswered. This study would not tell the reader whether or not this type of stimulus elicits sexual material in greater amounts or whether the stimulus simply taps the broad response repertoire of people more adequately. It is extremely unfortunate that this factor could not be ascertained within the confines of the rather rigorous and demanding variance design. However, in order that this area not go completely unattended, considerable frequency data were collected simultaneously with the projection judgments.

There is a growing recognition that we must not be limited by narrow conceptions of what constitutes the scientific method, but instead, use any approach which conforms to the broad aims of science rather than its dogmas.

Murray (30) has remarked that "psychology has a choice of two alternatives at the present time; to study important problems

with yet inadequate instruments or to study with adequate instruments unimportant problems.''

RESULTS

In order to facilitate both the reading and interpretation of the results, the experimental design and measurements of productivity will be briefly re-examined.

It is to be recalled that the variables are concerned with the roles played by physical ambiguity (outline, achromatic photograph, and chromatic photograph), situational ambiguity (amount of overt-ness depicted), theme type (sex and hostility), and marital status. Productivity has been measured by number of words, amount of projection, and transcendancy scores. Thus, for each of the six subjects who wrote stories to the chromatic version of sex stimulus "A" there are three independently derived scores. The same applies to the six subjects who responded to the achromatic version of sex stimulus "A" and to those six responding to its outline form. This procedure was followed for each of the eight chromatic stimuli.

The hypotheses are stated in null form. This particular form limits, by definition, the results that may be included as a direct test of the hypotheses. Thus, in this particular experimental effort, only the main effects of each analysis may be considered; that is, the contributions of clarity singly to the clarity hypothesis, theme singly

to the theme hypothesis, et cetera. The interactions, however, are perhaps of greater importance as they represent a more detailed and sophisticated analysis of mutual or joint effects. By this the writer means that interactions afford the possibility of studying specific relationships such as the differential effect of sex card "C" in outline form to hostility card "A" in color for either married or unmarried subjects. The main effects, for example, may reveal no differences within the theme continuum or within the action level continuum. The interaction of these two variables may, on the other hand, show significant effects.

The analysis of the word and projection data disclosed these measures to be particularly unrevealing with respect to differential effects of the variables. These data are presented in Appendix C and show only a single significant interaction arising from each analysis. To exemplify the insignificance of these "significant" interactions, one may consider the theme/situational ambiguity/marital status/physical ambiguity interactions found in the projection data. A detailed analysis of this specific interaction requires the computation of 1,127 t-ratios. Specifying the minimal level of statistical acceptability at the 0.05 level of confidence, one would anticipate at least fifty-five significant t-ratios from this analysis on the basis of chance. Less than half this number of significant t's were found.

Consequently, it is felt that this projection analysis can not justifiably be included in the results proper and evaluated as though these differences were true ones. It may be said, however, that it is not possible to demonstrate conclusively that these differences are spurious, but only that the number of significant t-ratios is not sufficiently great to reject the hypothesis that they did not occur by chance.

The same reasoning applies to the word analysis. Another factor strengthens the assertion that these data do not invalidate the hypothesis. It is to be recalled that the primary interest of this study was to ascertain the differential effects of the variables on the productivity of the stimuli. The word analysis, even if it had been found to contain numerous significant interactions, would have little direct bearing on this problem. Of greater importance is its relation to the other measurements. This will be treated separately as a specific hypothesis.

The results, then, will be concerned exclusively with the transcendancy data. Within this analysis it was found that level of action was borne out as a significant main variable. The rest of the variables (clarity, theme, marital status) considered independently, support their respective null hypotheses of no difference.

In view of this finding it is felt that the data should be presented in the following manner: The hypotheses will be stated in their

original form and, unless otherwise indicated, considered tenable.

Following a statement of the hypothesis, the results of the significant interactions that bear on it will be considered.

It must be vigorously stressed that the results are tentative and inconclusive. As is often the case with exploratory research, the findings merely indicate that the total picture of a defined area is not composed of elemental isomorphic relationships, but rather, extremely complex ones that appear to be interrelated.

Hypotheses

Hypothesis 1. "Productivity of a picture type projective test is not significantly increased or decreased as the physical ambiguity of the stimulus complex increases or decreases."

As previously stated, this variable, considered independently, was found to be insignificant as a main effect (see Table IV).

A significant interaction was found, however, to which physical ambiguity contributed jointly with theme type. Table V offers the primary statistics from which the t-ratios discussed below were computed.

These t-ratios revealed the achromatic sex pictures to be significantly more productive than the achromatic hostility pictures. Of particular importance here is that no differences were noted within

TABLE IV
ANALYSIS OF VARIANCE FOR TRANSCENDENCY DATA

Source of Variation	Sum of Squares	df	Estimate of Variance	F	p
Main effects:					
Theme	0.84	1	0.84		
Situational ambiguity	186.19	3	62.06	2.88	0.05
Marital status	82.50	1	82.50		
Physical ambiguity	5.99	2	2.99		
Interactions: ¹					
TS	240.79	3	80.26	3.73	0.05
TM _s	203.21	1	203.21	9.45	0.01
TP	244.23	2	122.11	5.67	0.01
SM _s	50.69	3	16.89		
SP	249.50	6	41.58		
M _s P	54.90	2	27.45		
TM _s P	41.85	2	20.92		
TSP	166.73	6	27.78		
SM _s P	270.50	6	45.08		
TSM _s	240.77	3	80.25	3.73	0.05
TSM _s P	158.08	6	26.34		
Within	2,064.66	96	21.50		
Total	4,261.43	143			

¹ The letter "T" refers to theme; "S" refers to situational ambiguity, "M_s" refers to marital status, and "P" refers to physical ambiguity.

TABLE V
STATISTICS ON THE THEME/PHYSICAL AMBIGUITY INTERACTION

Theme	Physical Ambiguity	M	σ	σ_{est}
Sex	1	10.25	6.13	1.23
Sex	2	12.75	7.47	1.52
Sex	3	9.91	4.09	0.83
Hostility	1	11.04	5.17	1.05
Hostility	2	9.04	3.78	0.77
Hostility	3	12.37	4.24	0.86

Mean differences:

Sex 2 - Hostility 2 = 3.71

Hostility 2 - Hostility 3 = 3.33

Significant t Ratios

Greater Means	Smaller Means					
	Sex 1	Sex 2	Sex 3	Hostility 1	Hostility 2	Hostility 3
Sex 1	-	-	-	-	-	-
Sex 2	-	-	-	-	2.182	-
Sex 3	-	-	-	-	-	-
Hostility 1 . .	-	-	-	-	-	-
Hostility 2 . .	-	-	-	-	-	2.798
Hostility 3 . .	-	-	-	-	-	-

the sex continuum proper. In other words, the outline and chromatic forms, which had shown differences in past studies, failed to manifest these differences here. This finding does, of course, support the null hypothesis regarding the independent effect of physical ambiguity.

Within the hostility continuum a difference was manifest between the outline level of physical ambiguity and the achromatic form. The mean for the outline form was found to be significantly greater than the achromatic form, but not greater than chromatic. This finding again offers little that may be considered contrary to the position of no difference.

Hypothesis 2. "Productivity of sexual pictures is not significantly different from pictures depicting hostility."

In addition to the findings discussed above which bear on the effect of theme, a second significant interaction was found between theme and marital status (see Table VI). Significant t-ratios reveal that unmarried individuals receive higher scores to sexual stimuli than to hostility stimuli and higher sex scores than married subjects. Married subjects, to the contrary, receive higher hostility scores than sex scores.

TABLE VI
STATISTICS ON THE THEME/MARITAL STATUS INTERACTION

Theme	Marital Status	M	σ	σ_{est}
Sex	M	9.02	4.72	0.79
Sex	U	12.91	6.83	1.15
Hostility	M	11.25	4.39	0.74
Hostility	U	10.38	4.31	0.72

Mean differences:

Sex U - Sex M = 3.89

Sex U - Hostility U = 2.83

Hostility M - Sex M = 2.23

Significant t Ratios

Greater Means	Smaller Means			
	Sex M	Sex U	Hostility M	Hostility U
Sex M	-	-	-	-
Sex U	2.79	-	-	2.065
Hostility M	2.045	-	-	-
Hostility U	-	-	-	-

Although these findings are of importance with respect to the theme hypothesis, they appear more relevant to the hypothesis on marital status.

Tables VII, VIII, and IX disclose other relationships bearing on the theme hypothesis. These interactions involving the joint effects of theme, situational ambiguity, and marital status demonstrate sharply that the unmarried contribution to sex card 'A' (see Table IX) has resulted in numerous significant differences both between sex and hostility and within the sexual continuum. These differences, then, appear to have their basis not between themes but rather within the situational ambiguity continuum to be considered next.

Hypothesis 3. "Productivity of a picture type projective test does not vary significantly for stimuli depicting different levels of situational ambiguity in sexual stimuli."

Table IV discloses that this variable contributes significant differences to the productivity of a picture type projective stimuli. It is to be noted, however, that this significant main effect combines levels of situational ambiguity for both sex and hostility stimuli (see Table X). More specific interactions must be examined to determine the specific contribution of this type ambiguity within the sexual continuum.

TABLE VII
STATISTICS FOR THE THEME/SITUATIONAL
AMBIGUITY INTERACTION

Theme	Ambiguity Level	M	σ	σ_{est}
Sex	A	14.83	7.61	1.79
Sex	B	9.00	5.23	1.23
Sex	C	9.16	5.25	1.23
Sex	D	10.88	5.23	1.23
Hostility	A	10.77	4.80	1.16
Hostility	B	10.61	2.53	0.61
Hostility	C	11.83	5.21	1.26
Hostility	D	10.05	4.97	1.17

Significant t Ratios

Greater Means	Smaller Means							
	Sex A	Sex B	Sex C	Sex D	Hostility A	Hostility B	Hostility C	Hostility D
Sex A . . .	-	2.66	2.58	-	-	2.23	-	2.24
Sex B . . .	-	-	-	-	-	-	-	-
Sex C . . .	-	-	-	-	-	-	-	-
Sex D . . .	-	-	-	-	-	-	-	-
Hostility A	-	-	-	-	-	-	-	-
Hostility B	-	-	-	-	-	-	-	-
Hostility C	-	-	-	-	-	-	-	-
Hostility D	-	-	-	-	-	-	-	-

TABLE VIII
STATISTICS FOR THE THEME/SITUATIONAL
AMBIGUITY/MARITAL STATUS
INTERACTION

Theme	Ambiguity Level	Marital Status	M	σ	σ_{est}
Sex	A	M	10	4.18	1.48
Sex	A	U	19.7	7.22	2.40
Sex	B	M	7.1	3.67	1.22
Sex	B	U	10.9	5.89	2.08
Sex	C	M	8.9	3.48	1.23
Sex	C	U	9.4	4.61	1.63
Sex	D	M	10.1	6.28	2.22
Sex	D	U	11.7	1.40	0.49
Hostility	A	M	12.8	3.90	1.30
Hostility	A	U	8.8	4.85	1.61
Hostility	B	M	10	2.10	0.74
Hostility	B	U	11.2	2.81	0.99
Hostility	C	M	12.1	5.47	1.93
Hostility	C	U	11.6	4.93	1.74
Hostility	D	M	10.1	4.61	1.63
Hostility	D	U	10	4.13	1.37

TABLE IX
SIGNIFICANT t RATIOS WITHIN THEME/SITUATIONAL
AMBIGUITY/MARITAL STATUS INTERACTION

-
-
1. Hostility-A-Married vs. Sex-B-Married
 $t = 3.184$; $p = 0.05$
 2. Sex-A-Unmarried vs. Sex-B-Unmarried
 $t = 2.776$; $p = 0.05$
 3. Sex-A-Unmarried vs. Sex-D-Unmarried
 $t = 3.278$; $p = 0.05$
 4. Sex-A-Unmarried vs. Hostility-B-Unmarried
 $t = 3.269$; $p = 0.05$
 5. Sex-A-Unmarried vs. Hostility-C-Unmarried
 $t = 2.773$; $p = 0.05$
 6. Sex-A-Unmarried vs. Hostility-A-Married
 $t = 2.527$; $p = 0.05$
 7. Sex-A-Unmarried vs. Hostility-C-Married
 $t = 2.733$; $p = 0.05$
 8. Sex-A-Unmarried vs. Hostility-D-Married
 $t = 3.310$; $p = 0.05$
 9. Sex-A-Unmarried vs. all other groups
Significant difference beyond 0.01 level of
confidence.
-
-

TABLE X
STATISTICS FOR THE SITUATIONAL AMBIGUITY MAIN EFFECT

Ambiguity Level	M	σ	σ_{est}
A	12.8	6.74	1.12
B	9.8	4.30	0.71
C	10.5	4.91	0.81
D	10.5	4.80	0.81

Overt Level	Overt Level			
	A	B	C	D
A	-	2.962	-	-
B	-	-	-	-
C	-	-	-	-
D	-	-	-	-

Referring to Table VII, it is immediately apparent that the difference is solely a function of levels of situational ambiguity within the sexual continuum. Sex stimulus "A" was found to be significantly more productive than stimuli "B" or "C," but not "D." Conclusions regarding these findings will be postponed until each hypothesis has been considered, in view of the marital contribution to this significant main effect.

Hypothesis 4. "Productivity of a picture type projective test does not vary significantly for stimuli depicting different levels of situational ambiguity in hostility stimuli."

No differences were found within the hostility continuum with respect to situational ambiguity.

Hypothesis 5. "There are no significant differences between married and unmarried subjects with respect to any of the above hypotheses."

A marked difference was found between married and unmarried subjects with respect to sexual stimuli. The unmarried subjects, it is to be recalled, received significantly higher scores to sexual stimuli than married subjects. Close inspection of Tables VIII and IX reveals, however, that this difference may be a function of the extremely high scores given the responses of unmarried

subjects to sex stimulus "A." Therefore, this finding must be viewed as merely suggestive and not as a true difference.

Hypothesis 6. "There are no significant interactions between the primary variables."¹

As previously discussed and as indicated in Table V, four significant interactions were found in the transcendancy analysis. The hypothesis must then be considered untenable.

Hypothesis 7. "The number of words elicited in response to the various types of projective stimuli is not significantly related to the amount of projection in terms of clinical judgments or to transcendancy scores.

Words and Amount of Projection

Pearson product-moment correlation between these variables yields a correlation of +0.46. The t-test of significance demonstrates that this correlation is significant beyond the 0.01 level of confidence ($t = 4.34$).

The null hypothesis is considered untenable.

¹ Theme, physical and situational ambiguity, and marital status.

Words and Transcendancy Scores

Pearson product-moment correlation between the variables yields a correlation of +0.49. The t-test of significance demonstrates that this correlation is significant beyond the 0.01 level of confidence ($t = 4.68$).

The null hypothesis is then considered untenable.

Amount of Projection and Transcendancy Scores

Pearson product-moment coefficient for these two variables is +0.16. The t-test of significance for this coefficient yields a t-ratio of 1.31, which is insignificant.

The null hypothesis is considered tenable.

Theme Frequency

Prior to discussing the relevance of these data, it should be recalled that evaluations were made of the themes simultaneous with the judging of the protocols for amount of projection. The judges were asked to check in a space provided whether the story was principally one depicting a sexual relationship, a hostility relationship, or neither of these. These data were collected in this somewhat crude way for particular reasons. Firstly, collection of these

data in a more systematic way would have interfered with the projection judgments vital to the experiment. For example, were the judges required to rate 144 stories for amount of projection and, in addition, judge each story for the amount of sex, amount of hostility, and amounts of other theme types, the task itself would become so laborious that the validity of the projection judgments could be seriously questioned. Secondly, considerable difficulty was experienced in obtaining individuals who were willing to devote the hours required to judge the data on amount of projection alone.

As a consequence, the data presented in Table XI are in the form of frequencies. The four judges placed each story in one of three categories. Therefore, each story received four scores and are compiled on this basis in Table XI.

The chi-square test of significance was applied to the hostility frequencies and no differences were found between married and unmarried subjects. It is of interest that this parallels the finding of no difference between these groups in the transcendancy analysis.

A chi-square of 13.58 ($p = 0.01$, $df = 2$) was found for the sex data. Married subjects responded as would have been anticipated; that is, they generally gave sex stories to sex stimuli. Unmarried subjects, on the other hand, gave a large number of hostility stories to sexual stimuli.

TABLE XI
FREQUENCY OF THEMES

Themes	Sex	Hostility	Other	Total
<u>Hostility Stimuli</u>				
Married	4	75	65	144
Unmarried	1	77	66	144
<u>Sexual Stimuli</u>				
Married	88	16	40	144
Unmarried	66	41	37	144

A more extensive discussion of the theme frequencies in relation to each hypothesis will be found in the following section.

DISCUSSION

Physical Ambiguity

The marked lack of agreement with respect to the definition and function of physical ambiguity lies at the base of this research. It is to be recalled that Thurstone (41), Sherif and Cantril (38), and Bellak (1) all held the position that a decrease in the physical ambiguity of the stimulus results in a reduction of the amount of personalistic material forthcoming.

Frank (15) and Bruner and Postman (7, 8) asserted that the physical structure of the stimulus is not of paramount importance as all stimulus situations are potentially equivocal. Consequently, they felt it is not necessary to use unstructured stimuli to achieve the same end result.

Weiskopf (45) and Bingham (5) have taken the position that an increase in structure yields increasing amounts of personalistic material. Of importance here is the fact that this position is in accordance with the only available research on the topic and is directly contradictory to the classical view.

The results of this study do not confirm the importance classically attributed to physical ambiguity. In only a single instance in

the multitude of possibilities was it ascertained that the outline form was more productive than the structured stimuli. In this case the outline form of hostility stimuli was found to produce higher transcendency scores than the achromatic form. Perhaps of greater significance is the fact that in no case was the outline form found to be superior to the chromatic form. The same reasoning must be applied to the position taken by Weiskopf and Bingham. Their previous findings demonstrated that an increase in productivity is positively related to an increase in physical structure of the stimulus. The results obtained here fail to support their view.

Generally speaking, it can be concluded that the differences obtained are not great enough to permit the rejection of the null hypotheses. Questions certainly remain with respect to the value of achromatic stimuli, but this again is not solely a function of physical ambiguity.

It would appear then that the position held by Frank (15) and Bruner and Postman (7, 8) is most tenable with respect to physical ambiguity.

This finding has particular merit with respect to future normative research on pictorial stimuli. It may no longer be considered necessary to use physically ambiguous stimuli which are so difficult to construct and equate.

Theme Type

Hypothesis 2 raises the question of the possible differential productivity of stimuli depicting sexual and hostility relationships. This hypothesis was not invalidated by any of the main effects. Of particular significance, however, is the fact that only minor differences were noted, although the theme frequency data suggest real differences do exist. This finding, if borne out in later research, would seem to have wide ramifications in regards to protocol analysis. It would mean essentially that a subject can avoid the obvious relationship depicted in the stimulus and still project as much as the individual who deals directly with the relationship displayed in the picture. These tentative findings also suggest that there may be real differences between married and unmarried subjects with respect to theme frequency.

Of particular interest is the fact that the judges, although producing reliable ratings, consistently failed to take this avoidance of the stimulus content into account in their scoring.

Situational Ambiguity

Bijou and Kenny (4) have proposed somewhat forcefully that physical ambiguity and situational ambiguity may not be the same in

projection stimuli. In attempting to explore this relationship, these authors conducted two experiments. Having had the standard Thematic Apperception Test cards judged in terms of number of possible interpretations each card could elicit, they ranked the cards and divided the continuum into three sections. Further study revealed that the cards judged to be of "medium" situational ambiguity elicited significantly more personality material than did the "low" or "high" cards.

Inspection of their data by the writer disclosed that a number of those cards judged to be of "medium" psychological ambiguity were of the type in which action was imminent; that is, it appeared that something was about to take place. This subjective impression was supported by a reinspection of the writer's earlier work (5) and consequently was included in the form of hypotheses 2 and 3.

These hypotheses state essentially that productivity is unrelated to the amount of situational ambiguity depicted in sex and hostility stimuli.

Bellak (3) has stated, "While it holds true that there is more projection and less adaptation if the stimulus is not well defined, a stimulus more suggestive of aggression will allow it to be projected more easily than one not suggestive of aggression at all."

The first portion of Bellak's statement has been determined to be contrary to available empirical findings. Part two concerns the

hypotheses and findings discussed below and appears to be equally at odds with the facts.

No differences were found with respect to levels of situational ambiguity using the hostility theme. The data did, however, yield a significant main effect with respect to situational ambiguity in sexual stimuli.

It was found that sexual situational ambiguity level "A" produced significantly higher transcendency scores than levels "B" or "C" but not "D." Thus, it can be stated tentatively that the least and most overt sexual stimuli may be superior in eliciting personalistic material for samples that include both married and unmarried individuals.

Marital Status

Perhaps the most meaningful series of results arising from the data on marital status comes from the interaction between theme and marital status. Keeping the data on theme frequencies in mind, one finds unmarried subjects producing higher transcendency scores to sex stimuli than did married subjects, and having higher sex scores than hostility scores. To the extent that transcendency scores reflect the number of personalistic statements made, it appears that unmarried subjects reveal more about themselves in attempting to avoid the

sexual stimulus content. This is evidenced by the apparently disproportionate number of hostility themes told to sexual stimuli by unmarried subjects.

The married subjects, on the other hand, received higher transcendency scores to hostility stimuli than to sex, and responded as would have been anticipated with respect to theme frequency; that is, the bulk of their themes to sexual stimuli were of a sexual nature and the bulk of their themes to hostility stimuli described a hostility relationship.

One of the most widely accepted clinical assumptions regarding the general projection hypothesis states that the behavioral or need areas not frustrated will not manifest themselves in responses to projective stimuli. It would follow that married subjects should receive lower transcendency scores to sexual stimuli than unmarried subjects. This assumption was tentatively borne out but must be interpreted with reservations due to the unusually larger contribution made by unmarried subjects in response to sexual stimulus "A."

Measurements

The results obtained to hypothesis 6 have interesting and broad implications. It is to be recalled that this hypothesis suggested that the three forms of measurement were unrelated.

The significant positive correlation found between number of words and amount of projection is somewhat contrary to the generally held position on this point. Abt (1), for example, pointed out that the length of the protocol has little if anything to do with the amount of projection contained therein, as projection is solely a function of content. Instances are cited where these variables are negatively related; that is, short rich themes are compared with long sterile ones.

The data available from this study would indicate that the position of no relationship, or a negative relationship, is not tenable, at least insofar as the judges used in this study are concerned.

It was, of course, anticipated that a positive correlation would be found between number of words and transcendency scores, as they are related by definition.

Weiskopf (44) has described her relatively objective transcendency index as a measure of fantasy and assumed a high positive correlation between this index and amount of projection. Bijou and Kenny (4) took the opposite tack and asserted that the amount of fantasy elicited to stimuli reveals little about the amount of projection.

The correlation between these two variables was found to be +0.16, and is insignificant. The Bijou and Kenny position, therefore, must be considered tenable.

The fact that both the projection ratings and the transcendency scores were highly reliable renders this finding almost impervious to criticism. This assumes, of course, that the projection judgments are valid. The possibility exists that in judging the amount of projection contained in a protocol judges work from a frame of reference which isolates the figure with whom the subject identifies; that is, judgments may be made entirely on the basis of the qualities attributed the "hero" figure. In transcendency scoring, on the other hand, collateral relationships, events, and feelings are given equal weight with those of the central figure.

An attempt was made to have the judges disclose the method used to arrive at a projection score. All of them alluded to the above-referred-to possibility but failed to express it directly. It was apparent that each judge employed the standard Murray (30) method of arriving at a score; that is, the "hero" or stimulus figure with whom the subject identified was sought out first. Beyond this initial step by the judges nothing could be ascertained in the postjudgment retrospection. It may be assumed, therefore, that the Murray technique was used throughout the protocol analysis. This system, it should be pointed out, stresses the roles and attitudes attributed to the "hero" figure. It follows that if the subject begins initially by attributing roles and attitudes to the "hero" that are not

more or less direct manifestations of his own behavior systems, the protocol analysis will be considered unrevealing. By this it is meant that if the subject, for example, describes the "hero" as a well-controlled individual with a high level of aspiration who is undisturbed by the chaos that surrounds him, the projection score will be low. This is a function of the fact that the judge is implicitly searching not for projection per se, but for manifestations of minor and major behavioral pathologies. The description of the "hero" as normal, then, produces a low projection score. The transcendency analysis, on the other hand, gives equal weight to feelings, attitudes, and events occurring to other stimulus figures and, as a consequence, results in markedly different scores.

The findings bearing on the function of physical ambiguity in picture type stimuli deserve considerable elaboration. Until the present time it has been considered axiomatic that the stimulus must necessarily be poorly defined to elicit the highly personalistic material identified as indicating projection. This assumption had, however, never been exposed to experimental examination, and as a consequence has played a critical role in the construction of personality tests. Numerous psychologists (1, 31, 35, 38) prominent in the personality test area have stated unequivocally that this is the prime requisite in the construction of projective tools. They have stated further

that an increase in the physical clarity of the picture results in response stereotypy.

The results of this study fail to support this contention. A few minor differences were found in terms of differential productivity to different levels of physical ambiguity. Most of the findings, on the contrary, demonstrate that the differences exist not with respect to physical ambiguity, but rather in the continuum of situational ambiguity. In essence, it would appear that it is not how unmistakable or clear the stimulus figures appear, but rather what the figures are doing; i.e., how overt the act appears to be. Moreover, it was found that differences exist between types of stimuli with respect to situational ambiguity. Varying situational ambiguity produced differences in response to the sex stimuli, but not to hostility.

It is felt by the writer that the major fallacy, regarding "stimulus" ambiguity, lies in the neglect of the fact that stimuli depicting interpersonal relationships are by definition ambiguous, and that it is the overtness of the stimulus relationship that dictates its level of ambiguity.

In this society the verbal expression of hostility is more often than not acceptable and often encouraged. This does not apply to sexual behavior as definite rules dictate when and where these behaviors may be expressed. The primary limit or requisite is, of

course, marriage. This study sheds light on the response patterns of married and unmarried subjects to sexual and hostility stimuli. No major differences were noted between these groups with respect to hostility stimuli. This finding coincides with the general cultural pattern which permits relatively free expression of this need.

Striking differences were noted in responses to sexual stimuli between marital groups. Generally, the married subjects gave sexual themes to sexual stimuli and the stories were relatively unproductive with respect to amount of personalistic material. The unmarried subjects gave significantly more personal material in terms of transcendancy scores than married subjects, and received higher scores to sexual than to hostility stimuli. A large number of the themes given by unmarried subjects to sexual stimuli were of a hostile rather than a sexual nature. This finding would tend to support the classical psychoanalytic position which asserts that hostility is most readily expressed toward objects or relationships that are desired but unattainable.

Implications for Further Research

The results of this experiment suggest the need for a number of extensive investigations.

The theme frequency data appear to offer numerous and possibly fruitful research problems. Sears (36, 37) has found experimentally that subjects who lacked insight into the amount of a given trait they themselves possessed attributed a greater amount of that trait to other people. He found further that lack of insight was not a generalized characteristic of people, but rather was confined to specific behavioral areas. If one views projected material as wishes, attitudes, or habit hierarchies which are incompatible with personal roles, it appears feasible that unmarried individuals would offer more personalistic material to sex stimuli than married individuals. This was borne out with respect to the transcendency analysis. When considering the theme frequency data, however, the possibility arises that the unmarried subjects project not the wish or attitude compatible with the stimulus content, but rather a hostile one. It could be hypothesized that projection to a desired, but in reality unattainable stimulus complex, takes on much the same form as is displayed in reaction formations.

The results of this experiment would further suggest there may be other "more productive" areas within which stimuli can be composed. It was determined, for example, that there are differential effects within the sexual stimuli continuum but not within the hostility continuum. This same hypothesis could be applied to stimuli depicting more detailed relationships, such as father-son, mother-daughter, and all possible combinations of these. It is the writer's feeling that this normative research must necessarily be completed before picture type tests will merit the acceptance they now have.

The somewhat peculiar lack of relationship between transcendency and projection scores should undergo rather rigorous scrutiny. In that the transcendency index by definition measures the amount of personalistic material contained in a protocol, the question arises as to what specific factors are used in arriving at a score for the amount of projection contained in a protocol. These factors, whatever they may be, could in all probability be measured in that the judges appeared to use them consistently.

SUMMARY AND CONCLUSIONS

In the area of projective psychology very little research has been done with respect to the basic tenets and assumptions radiating from the projective hypothesis. A great deal of research, however, has been carried out on higher order factors involving projective tools, and has offered a wealth of material. The results of this vast array of experimental effort have led, not to unified thinking, but rather to the establishment of theoretical camps. All of these theoretical camps seem to find support in the varied results offered by this higher order research.

It is the writer's feeling that prior to testing hypotheses concerning, for example, differential test response patterns in schizophrenics and manic depressives, we concern ourselves first with the stimuli themselves and the assumptions underlying them. Testing the above example and finding no differences would mean very little were it found later that the stimuli used elicit sterile material from people representing all levels of psychological adjustment.

This study was undertaken to investigate the differential effects of physical and situational ambiguity, theme type, and marital status on the productivity of picture type projective tests. Three

levels of physical ambiguity (outline, achromatic photographs, and chromatic photographs) and four levels of situational ambiguity (levels of overtness) were employed. The theme types used depicted sexual and hostility settings. Further, the complex analysis of variance design was employed for both married and unmarried samples.

The findings are as follows:

1. The classical position and the position held by Weiskopf and Bingham (5) with respect to physical ambiguity of the pictures were not borne out. Only minor differences were found in terms of productivity for the three levels of physical ambiguity.
2. No major differences were found regarding the differential productivity of sexual and hostility stimuli. These theme types did, however, contribute jointly with other variables to produce significant interactions. It may be tentatively assumed that sex and hostility stimuli will manifest differences if complex interrelationships with other variables are given consideration.
3. Situational ambiguity depicted in sexual stimuli was determined to be a significant variable. No differences were detected, however, within the hostility continuum.
4. Numerous differences were found with respect to marital status and the primary variables. Particular caution should be exercised in interpreting these results as indications were noted that the

findings may be a function of the unmarried subjects' high scores to one particular stimulus. Further research is mandatory before definite conclusions may be drawn.

5. The number of words elicited was found to be significantly related to the amount of projection as rated by judges and to transcendency scores. Ratings of amount of projection and transcendency scores were, however, found to be unrelated.

6. Significant differences were found in the theme frequency data. No differences were noted with respect to hostility stimuli but sexual stimuli provided marked differences. Unmarried subjects gave a large number of hostility stories to sexual cards and married subjects responded in accordance with the actual stimulus relationship depicted.

In conclusion, it should be emphasized that this investigation was carried out in an attempt to obtain some general insights into an extremely complex and seemingly fathomless behavioral area. It is hoped that the results are sufficiently provocative to stimulate further research on these rudiments of picture type projective tests. Specifically, inquiry into the interpersonal relationships depicted in the stimulus appear warranted. Situational ambiguity seems to be a more critical variable than physical ambiguity and deserves considerable attention. The results regarding marital status offer innumerable research possibilities.

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APPENDIXES

APPENDIX A









APPENDIX B

THE TRANSCENDENCE INDEX

1. Intracception refers to the ascribing of emotions, desires, thoughts, fantasies, etc., to the figures in the picture.
2. Temporal transcendence refers to the inclusion of events which occur prior to, or after the event shown in the picture.
3. Spatial transcendence refers to the inclusion of persons, objects, events, etc., which are outside the field of vision represented by the picture; e.g., "other children are playing outside."
4. Relationship refers to the characterization of figures as related to other figures in the same picture. Generally refers to kinship (father, mother, son, wife) or social relationships (friend, suitor).
5. Content of speech refers to verbal statements made by pictorial figures; e.g., "He demands an explanation as to where the money has gone."
6. Evaluation refers to value judgments of the figures; e.g., "handsome," "well groomed," "ugly," "pretty," etc.
7. Atmosphere refers to the characterization of the whole picture or part of it in terms of the emotional response it elicits, such as "this picture is uncanny" or "this is a calm and peaceful scene."

8. Imperative refers to comments to the effect that one of the figures "should," "must," "is supposed to," act, feel, or think in a certain manner.

9. Symbolism refers to the conscious and explicitly verbalized ascribing of symbolic meaning to the picture, such as "this represents climbing the ladder of success."

10. Emphasis refers to the singling out or stressing a part of the picture. Statements such as "The most important thing in the picture is . . ." fall into this category.

11. Physiological conditions refers to statements attributing to individuals physiological characteristics which can not be pictorially represented in an unambiguous manner; e.g., "He is sick," "He is dead," "He has a weak heart," etc.

12. Possession refers to comments implying that an individual owns an object; e.g., "These are his books." However, statements of this kind are not scored if the owned object is a piece of wearing apparel worn or carried by the owner. Example: "His suit is black" is not scored.

13. Quantification refers to numerical statements on specific times of the day, dates, ages of the individuals, heights, etc. Such statements are scored only if they are not approximation; e.g., "She is 20" receives one score. "She is about 20" receives no score.

14. Ability refers to comments stating that an individual can, is able to, do something, etc.

A. In this study no stringent rules have been worked out concerning the specific transcendence category to be applied to a statement. For example, it does not make any difference whether a statement is scored as "intraception" or as "spatial transcendence," because the results are evaluated in terms of the number of transcendences rather than the kind of transcendences.

B. A simple sentence without dependent clauses is given one transcendence score. Each dependent clause is given one additional score. Compound sentences are given one score for each simple sentence of which they consist. E.g., "The woman is standing in front of her son and she is daydreaming" receives two scores; namely, "relationship" and "intraception."

C. If one simple sentence contains more than one transcendence category, only one score is given; e.g., if one man is shown in the picture and the subject states that another man has just left the room, this statement is a "spatial transcendence" and a "temporal transcendence." However, it is given only one score.

D. This point gives exceptions to some of the rules stated in C. It states special rules for the category "intraception." Simple

sentences which ascribe emotions, feelings, thoughts, etc., to the figures in the picture are given one score; e.g., "he is daydreaming," "he is thinking," "he is worrying." If the content of the emotions, feelings, thoughts, etc., is stated, additional scores are given. Such additional scores, however, are only given if the content mentioned is transcendent. If, for instance, a woman is described as thinking of a man, this statement is given two scores if the man is not shown in the picture, and one score if he is shown in the picture. Or, in 8 BM, the statement "the boy in the foreground is thinking he will become a doctor" receives two scores; namely, "intraception" and "temporal transcendence." However, the statement "the boy in the foreground is thinking of the operation" gets one score. If feelings, emotions, thoughts, etc., are ascribed to more than one person, only one score is given if the persons are not separately listed (as in "they are sad"). However, if the persons are separately listed, one score is given for each person; e.g., "the old man and the young man are sad" receives two scores. The same rule applies to the category "evaluation"; e.g., "they are pretty" receives one score; "the man and the woman are pretty" receives two scores.

E. If alternative descriptions are given (such as "this could be . . . or . . . or . . ."), only one of the alternatives is scored; namely, the one with the highest transcendence. Negations are scored

in the same manner as affirmative statements; e.g., "he is not afraid" receives one score; "she is not his mother" receives one score.

F. "Speech content" does not refer to statements such as "he is speaking." It is only applied if the specific content of the conversation is stated. "He is speaking" is not considered a transcendence. However, if the verb used gives indications as to the content of the conversation, as in "arguing," "pleading," "consoling," the statement is given one score.

G. The category "relationship" refers only to figures shown in the picture, not to transcendent figures. It is scored only if both figures which are described as related are shown in the picture.

H. If a transcendent comment is repeated, it is scored once only if it is repeated in exactly the same words. If different words are used in the repetition, another score is given. (Note that different forms of the same noun, verb, etc., are not considered different words; e.g., if a subject says "he thinks" and later reports "he is thinking," the second statement is not given an additional score.)

I. "Sequiturs" are not scored separately. "She is his mother. The son is standing behind her" receives one score; namely, "relationship." "Son" is not scored separately, since it follows from the preceding statement.

J. The terms "something" or "somebody" are not scored as specific content in the categories "intraception" and "speech content." (For example, "he is thinking of something" receives one score only. "He says something" receives no score.)

K. Belongingness to an occupational group is not scored as a transcendence; e.g., "a nurse" receives no score. "Her nurse" receives one score; namely, "relationship."

L. "Trying to" is to be regarded as "wanting to," and, therefore, it is scored "intraception."

APPENDIX C

ANALYSIS OF VARIANCE FOR WORD DATA

Source of Variation	Sum of Squares ¹	df	Estimate of Variance	F	p
Main effects:					
Theme	2,240.44	1	2,240.44		
Situational ambiguity	12,177.63	3	4,059.21		
Marital status . .	9,120.25	1	9,120.25		
Physical ambiguity	273.88	2	136.94		
Interactions:					
TS	10,877.12	3	3,625.70		
TM _s	9,735.11	1	9,735.11		
TP	13,998.34	2	6,999.17		
SM _s	20,132.31	3	6,710.77		
SP	11,272.24	6	1,878.70		
M _s P	4,584.53	2	2,292.27		
TM _s P	29,940.86	2	14,970.43	3.71	0.05
TSP	19,931.10	6	3,321.85		
SM _s P	25,158.69	6	4,193.11		
TSM _s	22,141.45	3	7,380.48		
TSM _s P	20,975.13	6	3,495.85		
Within	386,720.60	96	4,028.34		
Total	559,280	143			

¹ $\sum (\sum X_i^2)_s - (\sum X_i)(M_t')$

MEANS, STANDARD DEVIATIONS, AND SIGNIFICANT *t* RATIOS
FOR THEME/MARITAL STATUS/PHYSICAL AMBIGUITY
INTERACTION FROM WORD ANALYSIS

Theme	Ambiguity	Marital Status ¹	M	σ	σ_{est}
Sex	1	M	124.50	46.0	13.9
Sex	1	U	148.50	59.0	17.8
Sex	2	M	111.25	45.0	13.6
Sex	2	U	192.25	68.9	20.8
Sex	3	M	135.75	51.8	15.6
Sex	3	U	127.83	59.8	18.0
Hostility	1	M	139.83	61.9	18.7
Hostility	1	U	163.33	78.7	23.7
Hostility	2	M	149.16	84.0	25.3
Hostility	2	U	116.25	47.8	14.4
Hostility	3	M	155.50	57.4	17.3
Hostility	3	U	163.33	50.9	15.4

¹ M = married; U = unmarried.

Significant *t* Ratios
(group with greater mean underlined)

1. Sex-Unmarried-Black and White vs. Sex-Unmarried-Outline.
 $t = 2.355$; $p = 0.05$.
2. Sex-Unmarried-Black and White vs. Sex-Married-Outline.
 $t = 2.17$; $p = 0.05$.
3. Sex-Unmarried-Black and White vs. Sex-Married-Black and White.
 $t = 3.255$; $p = 0.01$.
4. Sex-Unmarried-Black and White vs. Sex-Married-Color.
 $t = 2.71$; $p = 0.05$
5. Sex-Unmarried-Black and White vs. Hostility-Unmarried-Black
and White. $t = 2.995$; $p = 0.01$.

df = 22

ANALYSIS OF VARIANCE FOR PROJECTION DATA

Source of Variation	Sum of Squares	df	Estimate of Variance	F	p
Main effects:					
Theme	32.11	1	32.11		
Overt level	155.66	3	51.88		
Marital status . .	10.02	1	10.02		
Clarity	38.88	2	19.44		
Interactions:					
TS	249.44	3	83.14		
TM _s	51.36	1	51.36		
TP	183.16	2	91.58		
SM _s	110.30	3	36.78		
SP	133.33	6	22.22		
M _s P	83.38	2	41.69		
TM _s P	39.28	2	19.64		
TSP	94.61	6	15.76		
SM _s P	209.28	6	34.88		
TSM _s	61.64	3	20.54		
TSM _s P	575.38	6	95.89	3.17	0.01
Within	2,902	96	30.229		
Total	4,930	143			

SIGNIFICANT t RATIOS WITHIN THEME/SITUATIONAL
 AMBIGUITY/MARITAL STATUS/PHYSICAL
 AMBIGUITY INTERACTION FROM
PROJECTION DATA

Stimuli with Greater Means	Stimuli with Smaller Means ¹					
	A	B	C	D	E	F
Sex A-Colored- Unmarried	4.23	5.67	2.81	4.74	5.33	7.80
Sex A-Black and White- Unmarried	3.71	3.66	3.12	5.38	3.77	5.15
Sex A-Outline- Married				3.88		3.34
Sex D-Black and White- Married	3.14	3.18		4.68	2.97	4.27
Sex D-Black and White- Unmarried	4.18	4.50	3.61	5.85	4.04	7.05
Hostility A-Colored- Married				3.34		
Hostility C-Outline- Married				2.91		

- ¹ A = Sex A-Black and White-Married.
 B = Sex B-Colored-Unmarried.
 C = Sex B-Black and White-Married.
 D = Sex B-Outline-Married.
 E = Hostility A-Colored-Unmarried.
 F = Hostility D-Black and White-Married.

t required for 0.05 level of confidence = 2.77.

t required for 0.01 level of confidence = 4.60.

df = 4

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