

ABSTRACT

SUBCEPTION AS A VERIDICAL PROCESS AND PERCEPTUAL DEFENSE AS AVOIDANT AND VIGILANT BEHAVIOR

by Raymond J. Clausman

This study focused upon two major questions that have arisen from the "New Look" approach to perception. First, whether subception as a veridical process can occur when there is no awareness of the stimulus presentations, and second, how to account for both avoidant and vigilant behavior as a response to threatening stimuli. The two major objectives were: (a) to test for subception using a verbal accuracy indicator of discrimination when the stimuli are exposed too briefly to permit a phenomenological report of awareness, (b) to extend the concept of perceptual defense to include both avoidant and vigilant behavior.

The experiment was divided into three phases, the defense assessment, subception, and perceptual defense phase. In the defense assessment phase, Ss were administered a ranking task used in conjunction with the Blacky Pictures, from which defenses to various conflict dimensions were inferred. Four or more first place ranks of either Avoidance or Projection as a defense plus total rank consistency served as the two criteria in selecting Ss for the perceptual phases. On the basis of the selection criteria, 22 Ss were placed in an Avoidance Group and 18 Ss in a Projection Group. A random sample of 25 Ss who showed little defense consistency were placed in a No Defense Group.

A two-choice discrimination task was used in the perception phases

of the study. The perceptual stimuli were arranged in three pairs and consisted of a sex-neutral, aggression-neutral, and neutral-neutral pair.

In the subception phase, it was hypothesized that all Ss would show a greater response accuracy to the conflict stimuli as compared to the neutral stimuli. The exposure settings for presenting the stimuli at a level below phenomenological awareness were determined individually for each S. Ss were given a 40 trial discrimination series using the conflict-neutral pairs.

In the perceptual defense phase, it was hypothesized that the Avoidance Group would show an avoidant response to the conflict stimuli; the Projection Group would show a vigilant response; and the No Defense Group would show no differential response to the conflict and neutral stimuli. In this phase, the exposure setting was increased to a level, previously determined by a pilot study, at which approximately 50% correct discriminations of the neutral-neutral pair had been made. This exposure setting remained constant for all Ss. A 20 trial acuity test series was given, using the neutral pair. This was followed by a 40 trial perceptual defense series using the conflict-neutral stimuli.

The data were subjected to both an inter-category and inter-group analysis. The results failed to support the subception hypothesis. It was concluded that perception as a veridical process does not operate when the stimulus exposure is too brief to permit a phenomenological report of awareness. The results of the perceptual defense phase supported the view that avoidance and vigilance both serve as a defense in perception, and that the type of defensive behavior utilized can be predicted from a knowledge of Ss' inferred ego defense mechanisms.

Raymond J. Clausman

It was suggested that there was a greater need for a more precise definition of awareness threshold, for further study of the autonomic response as an indicator of perception, and for a study of the perceptual learning process within the experimental setting.

Albert J. Rabin

SUBCEPTION AS A VERIDICAL PROCESS AND PERCEPTUAL
DEFENSE AS AVOIDANT AND VIGILANT BEHAVIOR

By

Raymond J. Clausman

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

1960

G 15117

6/16/61

A C K N O W L E D G M E N T

I am pleased to acknowledge my indebtedness to Dr. Albert I. Rabin, chairman of my doctoral committee, for his guidance in this study, and to the other members of the committee, Dr. M. Ray Denny, Dr. Charles C. Hanley, and Dr. Gerald F. King, for their helpful comments and suggestions.

I am also indebted to Dr. S. H. Bartley for taking the illuminosity readings in the perceptual phase of the experiment and to my wife, Norma Clausman, for making the free hand drawings of the perceptual stimuli. I must also express my appreciation to the teaching assistants who made their students available as subjects and to the students themselves for their cooperation.

R.J.C.

TABLE OF CONTENTS

	Page
LIST OF TABLES AND FIGURES.	iv
 Chapter	
I. INTRODUCTION	1
Recent trends in perceptual research	1
Review of the experimental literature.	8
Perceptual sensitization	8
Tabled word frequencies.	15
Discussion	18
Subception	19
Discussion	26
Perceptual defense	27
Personality-centered approach.	37
Psychoanalytic concepts of defense.	46
Perceptual defense as avoidant and vigilant behavior	49
Discussion	52
Purpose of present investigation	54
Statement of hypotheses.	62
II. METHOD	64
Selection of defense measure and perceptual stimuli	
A pilot study	
Subjects	
Materials and apparatus	
Measures	
Procedure	
III. RESULTS.	85
IV. DISCUSSION	104
V. SUMMARY AND CONCLUSIONS.	115
REFERENCES.	119
APPENDICES.	126

LIST OF TABLES AND FIGURES

Table	Page
1. Summary of Operational Design.	84
2. Error Means and Mean Error Differences between Stimulus Categories for all Groups in the Subception Series	86
3. Error Means and Mean Error Differences to the Sex and Aggression Stimuli in the Subception Series.	88
4. Total Correct Response Means for the Three Groups in the Subception Series.	89
5. Analysis of Covariance of Correct Responses for the Three Groups in the Perceptual Defense Series.	92
6. Comparison of Avoidance and Projection Group Mean Accuracy Scores on the Perceptual Defense Series with the No Defense Group	93
7. Analysis of Variance of Error Scores to the Neutral Stimulus Presentations in the Perceptual Defense Series	95
8. Error Means and Mean Error Differences to the Neutral and Conflict Stimuli for the Three Groups in the Perceptual Defense Series.	97
9. Error Means and Mean Error Differences in Response to the Sex and Aggression Stimuli in the Perceptual Defense Series	99
10. Correct Response Means and Mean Differences between Male and Female Subjects in the Perceptual Defense Series	103
Figure	
1. Group Error Means for Successive Trial Blocks in the Perceptual Defense Series.	101

INTRODUCTION

RECENT TRENDS IN PERCEPTUAL RESEARCH

Traditionally, the approaches used in the study of perception have been of two kinds. One approach seeks to explain perceptual experience through the properties of the stimulus field. In the second approach, the emphasis has been upon the operations of the sense organs and associated neural structures which mediate the impinging physical stimuli. Within the last decade, however, there has emerged an ever increasing trend to treat perception in a broader behavioral context. This so called "New Look" or "Functionalist" approach to perception is summarized by Bruner and Postman (1949) in the following manner:

"...its primary concern is with the manner in which perceptual functioning is imbedded in and interacts with other forms of psychological functioning...for a full understanding of the perceptual process it is necessary to vary not only the physical stimulus and the sensory conditions of the organism, but also the central conditions--motives, pre-dispositions, past learnings--which have remained outside the formal limits of the perceptual system."

The initial experimental studies using the "New Look" approach stressed the importance of motivational states created by such factors as physiological needs or induced stresses as determinates in perception. Critical reviews of these early experiments have been presented elsewhere by Bruner (1951a). Allport (1955), and Bartley (1957). The initial experiments dealt with a broad motivational state which was assumed to be more or less uniform for all individuals.

More recently, the trend has been to consider the idiosyncratic motives or needs of subjects in the study of perception. As Jenkins (1957) in a recent review of the literature so aptly states:

"This enterprising step opened up a new path for research in which the focus on perception was directed through the lens of personality rather than through the broadly defined motivational state."

The personality-centered approach created a new and surprising amount of interest, as well as considerable controversy, in the area of perception. Most of the experimentation and debate centered upon three concepts which grew out of the personality-centered approach. These concepts were: perceptual sensitization, perceptual defense, and subception. It was especially the concept of perceptual defense that engendered the most research and argumentation.

Postman, Bruner, and McGinnies (1946), and Bruner and Postman (1947) introduced the concepts of perceptual defense and perceptual sensitization to account for the variations in recognition thresholds for tachistoscopically presented words of idiosyncratic value or threat. Perceptual sensitization was introduced as a principle to describe the lower recognition thresholds for words related to areas of high value held by subjects, such as art, religion, or esthetics. The authors concluded that an active, selective, perceptual process was present which permitted the organism to recognize stimuli related to his own value system more readily than the recognition of neutral stimuli. Perceptual vigilance has been used synonymously with the term perceptual sensitization. Vigilance was originally introduced by Bruner and

Postman (1947) to describe the behavior of certain subjects who had consistently lower thresholds for threatening stimuli than for neutral stimuli. However, subsequent writers also used this term to describe lower recognition thresholds to positively valued or non-threatening stimuli, thereby, equating this behavior with perceptual sensitization.

Because of this trend, little effort was made to account for the differential results found in many of the perceptual studies. One such attempt has been to treat perceptual vigilance as a second manifestation of perceptual defense. Within this framework, perceptual vigilance is considered to represent a tendency to recognize threatening stimuli quickly so that the threatening aspects of such stimuli may be altered or vitiated. Although perceptual vigilance and perceptual sensitization both represent a lowered recognition threshold response, the stimuli eliciting this response are quite different. Consequently, a differentiation between these two terms is necessary. In this paper, the use of the term perceptual vigilance will refer only to lowered recognition thresholds that are elicited by threatening stimuli.

The second and most controversial concept introduced was that of perceptual defense. This concept was postulated to account for the raised recognition thresholds for words representing threat to the individual. By using such a concept, Postman, Bruner, and McGinnies were implicitly drawing from one of the key concepts in psychoanalytic theory, that of the defense mechanisms. The idea of defense has proven invaluable in the theory of adjustment and maladjustment. Briefly, defense refers to the various operations by which the individual deals

with or binds anxiety or guilt feelings related to the expression of certain instincts. Certain external objects or situations are also defended against because they represent an inner instinctual demand.

As Fenichel (1945) states:

"There are defensive attitudes against painful perceptions just as there are defenses against any pain. Nevertheless... defenses against perceptions (and affects) seem to be performed first and foremost in the service of defenses against instincts."

It is this defense against painful perceptions that is implied in the concept of perceptual defense.

The concept of perceptual defense raised the crucial question of how the organism is able to know what to defend against and led to the third concept, that of subception. Bruner and Postman (1949) dealt with this problem in a theoretical manner by postulating a hierarchy of perceptual thresholds, one of these being veridical report. Other types of perception are probably affective in nature, and have thresholds below veridical recognition. Thus, they suggested two perceptual processes, veridical perception and affective perception. Some experimental evidence for such a view has been presented by McGinnies (1949), and Lazarus and McCleary (1951). They found that subjects could make an autonomic nervous system response to threatening stimuli even though the stimuli were presented too fast for conscious identification. McGinnies hypothesized that anxiety which was manifested in the autonomic response had a disrupting effect upon the veridical perceptual process, enabling the individual to avoid recognition of the stimulus for at least a time. Lazarus and McCleary labeled this autonomic discrim-

ination, subception. Postman (1953a) later revised his affective-veridical view and restricted perception to a single process, that of veridical response. His revised view will be considered in greater detail when the experimental studies related to perception are reviewed.

The concept of perceptual defense drew the interest of many experimentally oriented clinicians to the area of perception. It was well recognized that what an individual does in a perception task may reveal pertinent information about his personality, conflicts, and defenses. The opportunity to subject certain defense mechanisms to a more rigorous experimental scrutiny now seemed to be available. Psychoanalytic concepts have always been very difficult to test experimentally, and if it could be shown that perceptual behavior could be predicted by the psychoanalytic concepts of ego defense, some much needed validation of these concepts would be provided. The basic experimental design used in the study of motivational determinants in perception also had some elements in common with the familiar clinical tests, such as the Rorschach test, in that they both used relatively ambiguous stimuli to insure the maximum play of subjective factors in the individual's response. The experimentally oriented clinician also had a broader background in the psychoanalytic theory of defense than many experimenters studying perception, so he could at least feel that he was on some familiar ground as he invaded the rigorous and formal atmosphere of perceptual research.

It was the utilization of ambiguous stimuli which drew early protests from many critics of the personality-centered approach to percep-

tion. They argued that when subjects are given fuller information as in the usual psychophysical experiments, the percept is stimulus bound. The use of ambiguous stimuli was defended by its proponents who stated that only when there is a relative degree of ambiguity present can there be opportunity for subjective factors to enter into the response. There is a point as ambiguity decreases where all normal subjects must finally come to grips with the stimulus and deal with it. Only the psychotic individual would be capable of altering the stimulus under such conditions. Bruner (1951a) further justifies the use of ambiguity in the experimental situation by suggesting that "Most complex perception in our daily social lives is dependent upon the integration of far less reliable information than is given in a tachistoscope at rapid exposure."

Experimenters whose approach to perception was rooted in the psychophysical methods could not help but view with considerable skepticism the modification of perception by idiosyncratic motivational processes. Some critics (Howie, 1952; Prentice, 1956; Luchins, 1951) directed their arguments more to the question of why motivation should or should not influence perception rather than toward the behavioral data. Others (Pratt, 1950; Wallach, 1949) questioned whether the Functionalist approach was actually dealing with perception. Pratt (1950) admitted that motivational factors may affect judgment and motor responses, but he stated that they do not affect perception. He felt that whenever past experience does seem to affect perception we are dealing with a motor response. This view leads one to the difficult task of distinguishing

between perception per se and its response components.

Similarly, Wallach (1949) attempted to make a distinction between sensorily determined perceptual experience and a recalled trace complex which gives identity and meaning to the experience. He suggested that motives operate upon the recalled trace complex rather than upon the perceptual experience. Recent research by Bruner and Minturn (1955) placed this view in question. They demonstrated that identification, which is considered by Pratt and Wallach to be a response component, can modify the primitive perceptual organization of the field. It appears that a clear and acceptable distinction between a pure perceptual process and its response components is often impossible to make. If this be so, then relationships between needs and perception can hardly be refuted by such argumentation.

Other critics (Solomon & Howes, 1951; Freeman, 1954; Goldiamond, 1958) focused more directly upon the experimental data and attempted to reduce the concepts of perceptual sensitization and defense to more general principles such as set, word frequency, and response bias. They argued that the results in most instances could be explained in terms of non-perceptual variables. Postman (1953b) now entertains a similar view, but he does not go so far as to deny the importance of motivational factors in perception. He feels that motivation plays its role by influencing such variables as frequency, recency, and set.

The proponents of the concepts of perceptual defense and sensitization reply that these are not phenomena pointing to some underlying general law. General laws may influence their manifestations, but with

such factors as frequency and set controlled, the concepts can still be demonstrated.

In spite of prolific research, the effect of motivational and personality variables upon perception is little understood. Many of the experimenters have reported contradictory results. The results can be explained in many instances in terms of non-perceptual variables. Most of the experimental studies have been designed merely to demonstrate the validity of motivational concepts, with the result that there have been fewer attempts to study a variety of conditions under which motivational variables may or may not have a demonstrable effect. Attempts to reduce motivational concepts to simpler principles are quite plausible, but they do not appear adequate to explain all of the available data. In order to evaluate some of the previous experimentation and to give clarity to directions recent studies have taken, a review of the literature will be presented. This review will be divided arbitrarily into studies dealing with each of the three concepts: perceptual sensitization, perceptual defense, and subception. Although the studies dealing with each concept are reviewed independently, it must be emphasized that there is a close relationship among these studies. Some experiments deal with two of the concepts simultaneously; others find their roots in a related concept. Consequently, a particular experiment may be reviewed in part under one concept and in part under a second concept.

A REVIEW OF THE EXPERIMENTAL LITERATURE

Perceptual sensitization. Postman, Bruner, and McGinnies (1948)

introduced this concept in a study relating personal values to perceptual behavior. Measures on the Allport-Vernon Scale of Values were compared with subjects' recognition thresholds for tachistoscopically presented words related to these value areas. An inverse relationship was found between value rank and recognition thresholds of value related words. Of interest was the finding that some subjects had lower recognition thresholds for words related to low value areas as compared to thresholds for words related to high value areas. This type of behavior was often ignored by subsequent experimenters but has recently acquired new significance and will be discussed in greater detail when dealing with perceptual defense.

The results of the Postman, Bruner, and McGinnies (PBM) study have been confirmed in several experiments. Haigh and Fisk (1952) repeated the PBM study using an Analysis of Variance to treat their results. They also had subjects rank the word stimuli of the Allport-Vernon Scale according to personal preference. This ranking was made four weeks after the perceptual experiment. An inverse relationship was found between rank value and recognition thresholds, supporting the hypothesis that positive values tend to be associated with perceptual sensitization. Vanderplas and Blake (1949) found the same results using auditory stimuli. They noted that a small number of subjects showed an opposite trend, in that they had lower recognition thresholds for stimuli of low value.

McGinnies and Bowles, (1949) used portraits rather than stimulus words. A value was attached to each picture by telling subjects that the pictures represented a scientist, minister, etc. These occupations

corresponded to the value areas of the Allport-Vernon Scales. Recognition thresholds and scores on the Allport-Vernon Scales were then correlated. Fifteen subjects had negative correlations, while the remaining nine had positive ones. For the majority of subjects, then, the recognition thresholds were lower for portraits corresponding to areas of high value on the Allport-Vernon Scales. The nine remaining subjects had lower thresholds for portraits related to low value areas. The authors questioned whether some subjects might not show a consistent use of perceptual vigilance to low value stimuli. They suggested this as an hypothesis for future research.

McClelland and Liberman (1949) obtained measures of n-achievement for individual subjects using the TAT and other tests. Subjects were divided into three groups, high, middle, and low on n-achievement. In the perceptual task which was administered three months later, subjects were presented with achievement and security related words. The high n-achievement group had lower recognition thresholds for achievement-related words than did the middle or low groups. Both the high and middle groups had lower recognition thresholds for the security-related words as compared to the low group. From these results it was concluded that subjects tend to have lower thresholds for strong but acceptable need-related stimuli.

A number of experiments have been reported which have attempted to place in question the role of value in perception as was indicated by Postman, Bruner and McGinnies. Mausner and Siegel (1950) criticized the use of the Allport-Vernon Scales as a test of values. In their

experiment, amateur stamp collectors were required to learn the monetary values of a set of stamps. Recognition thresholds for the various stamps were then determined. No significant relationship was found between recognition thresholds and respective stamp value. The results were interpreted as contradictory evidence to the findings reported in the PBM study. The term value as used in the Mausner-Siegel study was an attribute given to the stimuli by an external authority, and as such, may or may not be related to the individual's needs. Secondly, we have no data related to the learning situation which could have produced individual differences in stimulus familiarity, and third, we have no knowledge of the effect of color on recognition thresholds.

The studies demonstrating perceptual sensitization had a more serious shortcoming as was shown by Howes and Solomon (1951), who demonstrated a relationship between frequency of prior exposure to the stimuli and recognition thresholds for such stimuli. In a further experiment based on the PBM design, Solomon and Howes (1951) attempted to answer the question of whether selective sensitivity to words from different value areas could be reduced to differences in the frequency of usage of such words. Word frequency was determined by reference to the Thorndike-Lorge Word Count (1944). They found that when stimulus words were of high frequency, value had no significant effect on recognition thresholds. A significant relationship did exist between low frequency words and value rank. Their results indicated that although word frequency accounted for a substantial part of the variance in recognition thresholds, it did not account for it all. Solomon and Howes

attributed this residual variance to idiosyncratic word frequencies. They stated that the Thorndike-Lorge Word Count was only a population index and was not precise enough to reflect individual differences. They also attempted to reduce the Allport-Vernon Scale to a more measure of word frequency.

Postman and Schneider (1951) in a similar study obtained essentially the same results as Solomon and Howes. However, they disagreed that the residual variance in subject's thresholds could be attributed to idiosyncratic word frequencies not measured by the Thorndike-Lorge Word Count. Postman and Schneider suggested that different degrees of emphasis or reinforcement connected with some words might exist over and beyond sheer frequency and may influence the strength of response dispositions. They preferred to think of frequency and recognition thresholds as dependent variables both of which are manifestations of a more fundamental property such as habits, hypotheses, or perhaps personal values. The authors emphasized the need for further research in which the frequency variable could be more precisely controlled.

Subsequently, Solomon and Postman (1952) performed an experiment in which the frequencies of various nonsense syllables were experimentally controlled. Subjects were required to read and pronounce lists of nonsense syllables with varying frequency. The variations in recognition thresholds were then measured. The authors found a significant decrease in recognition thresholds as frequency increased. The results confirmed the effect of the frequency variable under controlled conditions, but at the same time suggested that its effect may be limited.

Solomon and Postman concluded: "It will be well to exercise caution in invoking frequency as a mediator of all observed motivational selectivity although the contribution of this variable may be considered as established."

A rebuttal of Solomon and Howes' attempt to treat the Allport-Vernon test as a measure of word frequency was presented by Brown and Adams (1954). They revised the Allport-Vernon test so that the alternatives in all value areas except one were expressed in synonyms of low frequency as determined by the Thorndike-Lorge Word Count. The remaining value area had alternatives of high word frequency. Six forms of the test were constructed, each one favoring a different value area in terms of synonym frequency. According to the Solomon and Howes hypothesis, the subjects should choose the high frequency words and thus, achieve a high rank for the corresponding value area. Six groups of subjects answered one form of the revised test as well as the standard Allport-Vernon test. Subjects failed to show consistent changes in scores for the favored value area when compared with the scores of the other five groups to that value area. Correlations of the revised tests with the standard Allport-Vernon test remained significantly positive. It was concluded that word frequency alone does not determine the performance on the Allport-Vernon test.

A study which appeared to pose problems for both the word frequency hypothesis and the concept of perceptual sensitization was reported by Gilchrist, Ludeman, and Lysak (1954). Students scoring high and low on an anti-Semitism scale were used as subjects. Positively valued, nega-

tively valued, and neutral words were used as stimuli in the perceptual task. The positive and negative value words were equated for frequency by use of the Thorndike-Lorge Word Count. The neutral words were of higher frequency than either the positive or negative value stimuli. Each stimulus word was presented twice, once with the word "ink" written above and below it, and once with the word "Jew" written above and below it. The additional words were called the surrounds. Subjects were required to recognize and report only the stimulus words. Recognition thresholds for the combined conditions were found to be lower for both the positive and negative value stimuli as compared to the neutral stimuli. When the recognition thresholds for the two surrounds were compared, the results indicated that the thresholds for both the positive and negative value stimuli in the "Jew" surround were significantly higher, while thresholds for the neutral stimuli were significantly lower than thresholds for the "ink" surround.

The results cannot be explained by the frequency hypothesis since the neutral words were of higher frequency than the positive and negative words. The question was also raised as to why the emotionally loaded surround did not result in higher recognition thresholds for the neutral words. The authors also stated that the results cannot be explained by the concept of perceptual sensitization, since thresholds for the combined conditions were lower for the negative as well as the positive stimuli. They concluded that their results posed problems for all the existing concepts attempting to account for differential thresholds in perception. The authors seemed to have overlooked the fact

that Bruner and Postman (1947), and McGinnies and Bowles (1949) found that some subjects had lower thresholds for stimuli of low value, a behavior which they termed perceptual vigilance. They also suggested that some subjects might show a consistent use of vigilance to such stimuli. In the Gilchrist, Ludeman, and Lysak experiment, a significant variance within prejudiced subjects was found. This could indicate that there were consistent differences between subjects which were independent of prejudice classification and that categorization should be based, perhaps, on some other variable. Experiments such as this one point to the need for a better understanding of the conditions under which perceptual sensitization may or may not operate.

Tabled word frequencies. Some important questions have been raised concerning the use of tabled word frequencies as presented in the Thorndike-Lorge Word Count (1944). These word frequencies are based on the language behavior of various magazine writers in the 1920's and 1930's. It seems plausible that many changes in language behavior have occurred in the last twenty-thirty years. Many of the so called "taboo" words now appear in print, especially in the pocket size novels which are read by many college students. A new word count would be needed to indicate what changes have taken place in language behavior, a task both laborious and time consuming. We also have the recent medium of television which undoubtedly exerts a significant influence on word frequency.

A variable which would seem to be closely related to word frequency, especially words of low frequency is that of intelligence. The more intelligent students are likely to have had greater amounts of

exposure to the low frequency words in terms of both interest and reading experience. As yet, no study has been reported which describes the influence of the intelligence variable on recognition thresholds of word stimuli.

Variations in general word familiarity are also considered to exist within a given frequency range. For example, Solomon and Howes (1951) used such low frequency words as "percipience, erudition, uncoerced, and vignette" in their study, while Postman and Schneider (1951) used such words as "conception, logic, dominant, and literature", which fall within the same frequency ranges as the words above. The latter group of words is considered to be more familiar to students than the former group. Lazarus (1954) has suggested that the experimental results could be made to go in any direction by an appropriate selection of the word stimuli within a given frequency range. He also felt that giving low frequency ranks to the "taboo" words and then equating them with low frequency neutral words greatly underestimated the familiarity subjects had for such words.

Howes (1954) investigated the relationship between tabled word frequencies and student familiarity with words of such frequency. Students from two college populations were required to rank the infrequent words taken from the earlier Solomon and Howes (1951) study in order of frequency of usage among college undergraduates in general as well as frequency of personal usage. Correlations between student's rankings and ranks based on the tabled word frequencies were .80. The results indicated a significant relationship between word count data and student familiarity.

Some Contradictory results were subsequently reported by Cowen and Obrist (1958). The neutral words used in their study were ranked by the subjects according to individual familiarity along with the neutral words used in the Postman, Bronson and Gropper experiment (1953). Both groups of words fell within the same frequency ranges. It was found that the neutral words used by Cowen and Obrist were consistently given higher ranks by the subjects. The authors suggested that this result might be due to idiosyncracies of the students at the University of Rochester, or they could be related to differences in familiarity with words falling within the same frequency ranges. The familiarity problem is far from solved, especially when dealing with low frequency words.

Some years ago, Postman (1953b) began a research program to study the effects of the frequency variable in detail. One of the first studies reported dealt with the question of whether it was frequency of prior exposure, or frequency of prior word usage that was crucial variable for word recognition. To study these variables, Postman and Conger (1954) used three letter stimuli in the perceptual task. They obtained a frequency measure of the three letters as a word, and a measure of the three letters as a trigram. The tabled frequencies of the trigrams were significantly different from the word frequencies since the trigrams were not only words in themselves, but also three letter combinations used in other words. It was found that sheer frequency of stimulation is not significantly related to speed of word recognition, unless such stimulation is accompanied by specific responses from the subject. On

the basis of these results one might hypothesize that most students have made fewer responses to words such as "percipience" or "vignette" than to words such as "bitch", "penis", or "whore", which are often equated with uncommon words like the above in terms of frequency.

Since there are so many problems connected with tabled frequency data, a recent trend has been to avoid words and to use other stimuli with which subjects have had no previous experience. Postman (1953a) questions the use of such stimuli unless it can be shown that they have been equated in terms of frequency of previous experience. If pictures were used as stimuli, Postman would argue that some subjects have had more prior experience with pictures and would, therefore, have lower recognition thresholds. Such an argument can be applied to any stimuli used in a perceptual experiment. Individual differences undoubtedly exist in previous exposure to all classes of stimuli. It would have to be shown that previous experience with a class of stimuli such as pictures would have an effect upon the recognition of a specific picture stimulus before such an argument would be appropriate.

Discussion in spite of the criticism based on the frequency variable, the concept of perceptual sensitization appears to be a valid and useful one, since much of the evidence suggests an active, selective process in perception. Most of the experiments have related individual differences as measured by the Allport-Vernon Scale of Values to differential thresholds in perception. There has been little attempt to study the relationship of other acceptable needs to perceptual behavior. In fact, interest and research dealing with this concept has

declined rapidly within recent years. Bruner (1951) had stated that such data does not serve to explain perception but merely to indicate its problems. The current feeling may be that such studies are of little value, or that the frequency principle is sufficient to account for such behavior. However, it would appear that there is still considerable room for exploratory work in this area.

One current theory treats perception as an affective-veridical process. The affective response has lower thresholds than veridical response and tends to facilitate or disrupt the veridical process. This theory suggests some interesting problems for further research. First, it may be questioned whether both positive and negative stimuli occasion an affective response, and if so, how do the responses differ. Second, how does an affective response which facilitates veridical response differ from one which disrupts veridical perception? The answers to such questions would increase our understanding of the relationship of the various concepts such as sensitization and vigilance which now exist to describe perceptual behavior.

Subception. The concept of subception grew out of a basic problem encountered in the study of perceptual defense. This problem concerned the ability of the organism to detect threatening stimuli so that it might avoid them. Howie (1952) in his criticism of perceptual defense argued that such a concept suggested the presence of an homunculus within the organism who directs the organism toward or away from certain stimuli. The problem of stimulus detection immediately became a crucial one.

Bruner and Postman (1949) attempted to deal with this problem in a

theoretical manner by positing a hierarchy of response thresholds. Perceptual discrimination need not be restricted to one type of response such as veridical report. Rather, there may be a number of discrimination responses, each having its own threshold. The authors suggest that these other responses are affective in nature. In some situations an affective discrimination response would have thresholds below veridical report and would lead to avoidance behavior at the veridical level. Under this theoretical view, two types of perception were suggested, veridical perception and affective perception. No attempt was made to explain how these perceptual responses were mediated.

Some subsequent experimental data tended to confirm the Bruner-Postman view. McGinnies (1949), in a much criticized study, obtained an autonomic response measure prior to recognition of both taboo and neutral words. He found that the GSR preceding recognition of the taboo words was significantly greater than that preceding neutral words. He suggested that the presence of a taboo stimulus sets off an anxiety signal manifested in the autonomic response, which in turn leads to avoidance behavior in perception. McGinnies indulged in some speculation concerning the neurophysiological processes mediating such behavior. He hypothesized that the autonomic response is initiated as the visual impulses reach the optic thalamus. He further stated that:

"A rerouting of the afferent activity might then take place in the visual centers so that cortical integration would be effectively modified in the direction of phenomenological distortion."

This speculation stemmed from his analysis of the pre-recognition hypotheses to the taboo and neutral stimuli. He found a significantly

greater number of nonsense and unlike prerecognition hypotheses or guesses to the taboo presentations than to the neutral presentations.

Recently, Reyher (1960) has expressed a similar view concerning the disrupting effects of anxiety-producing stimuli. He created intense conflict situations under hypnosis and then studied perceptual recognition of relevant anxiety-related stimuli. He found that not all subjects show subception, but when such behavior occurs, it represents a pathological condition accompanying a highly conflictual emotional process. This differential response among subjects led him to postulate two processes in perception. First, for certain subjects, the anxiety response is activated at veridical thresholds and interferes with the cognitive process of identification. Second, in other subjects, the anxiety response activates levels of cortical integration not associated with conscious awareness. This occurs only under pathological conditions. Reyher's results indicate that subception is a function of the degree of threat.

Howes and Solomon (1950) in their criticism of the experiment by McGinnies (1949) stated that the simple factor of response suppression could account for the greater autonomic response to the taboo stimuli. Subjects could recognize the taboo word and register a high GSR, but they would then delay report of the taboo word until they were certain that it was such a word.

To control for the variable of response suppression, Lazarus and McCleary (1951) used nonsense syllables as stimuli. They conditioned an autonomic response to half of the nonsense syllables by using shock

as the unconditioned stimulus. All of the syllables were then presented at below recognition thresholds. The average GSR following the presentation of the shock syllables was significantly greater than that following the non-shock syllables. Their results confirmed McGinnies findings. The authors introduced the term subception to describe this autonomic discrimination. Subception was defined as:

"A process by which some kind of discrimination is made when a subject is unable to make a conscious discrimination."

Support for the subception concept has been provided by a number of other experimental studies (Lowenfeld et al; 1956; Blum, 1954; Nelson, 1955. The results reported by Lowenfeld, Rubenfeld, and Guthrie (1956) are of particular interest. They replicated the Lazarus and McCleary experiment and then attempted to extinguish the autonomic response previously conditioned to the shock stimuli. They found that responses to subliminal stimuli may follow a very different pattern of extinction than responses to stimuli presented at veridical thresholds. They also found a marked decrement in the GSR to shock stimuli presented supraliminally, when subjects were assured of no more shock. The GSR was not reduced in spite of assurance that shock would no longer occur, when such stimuli were presented too quickly for veridical identification. An autonomic reaction persisted even though subjects were no longer punished. These results suggested that the veridical perceptual process has an inhibitory effect upon the affective process.

A criticism of the concept of subception was presented by Bricker and Chapanis (1953), who demonstrated that even when the subject's

first verbal response is incorrect, the stimulus has conveyed some useful information to him. Subjects were given printed lists of the stimuli which were to be presented tachistoscopically. After a sub-threshold presentation of one of the stimuli, the subjects were instructed to use the word lists and guess which word had been presented. Subjects were able to select the correct stimulus with fewer guesses than would be predicted by chance. It was concluded that sub-threshold presentations of the stimuli did give subjects some cue information concerning the stimuli.

Bricker and Chapanis' results were subsequently confirmed by Lysak (1954) and Murdock (1954). These experimenters suggested that the subception effect could be explained in terms of the partial recognition of the shock syllables which then led to an anticipation of shock and produced the GSR. They concluded that the GSR is merely a sensitive indicator of this partial recognition of the stimuli.

The above studies did not, however, obtain a measure of the GSR. In a later experiment, Voor (1956) investigated the relationship between veridical information obtained from the stimulus and the GSR discrimination of the stimulus. He hypothesized that the subception effect would not be found when the subjects could not guess significantly above chance which stimulus had been presented. By using three levels of illumination, he was able to vary the amount of cue information given to his subjects. He found that as veridical information is lessened, the ability to respond affectively is also weakened. He interprets his results to mean that the GSR is dependent upon veridical cue information.

The results presented by Bricker-Chapanis, and others confirmed Postman's (1953) revised view of the perceptual process. In this revised view, he restricts the perceptual response to veridical report only. He then posits a hierarchy of response predispositions within veridical perception, each requiring a different quantity and perhaps a different pattern of stimuli before veridical response occurs. Under this view, the perceptual process becomes one of hypothesis confirmation or non-confirmation. In any given situation the organism is set for a limited range of events. The stimulus input serves either to broaden or narrow the range of possible hypotheses, and as the stimulus input increases the individual tends to confirm or deny specific hypothesis. The strength of hypotheses is measured in terms of the appropriate information needed to confirm or deny them. The stronger the hypotheses, the less information is needed to confirm them. Consequently, ambiguous stimuli are necessary to study hypothesis confirmation. The strength of hypotheses is related to past experience, such as frequency of previous confirmations. Motivational support for an hypothesis may increase or decrease its strength. Hypotheses whose confirmation signifies punishment or threat may be quite weak and require more information to confirm them. However, strong hypotheses may also be related to negative stimuli, then the opposite of defense or perceptual vigilance will appear to operate. This latter postulate seems to have been introduced to account for contradictory results occurring in perceptual defense research. Postman does not indicate under what conditions the hypotheses related to inimical stimuli may

be strong or weak. This would appear to be a crucial factor in predicting perceptual behavior, and one that will be dealt with in this present study.

Eriksen (1956) presents a similar view of subception. He criticizes the Lazarus and McCleary design in that it makes subception a statistical artifact of the stimulus conditions. He states that in this design, a restriction was placed upon the subject's verbal report since his response was limited to being either correct or incorrect, while the GSR was free to detect any partial discriminations the subject might make. A GSR could occur in the absence of a verbal discrimination as measured by a correct-incorrect indicator.

Recently, Dixon (1957) designed an experiment to meet the criticisms of both Bricker and Chapanis and Eriksen. He ensured total unawareness of the stimuli by using stimulus magnitudes well below the awareness thresholds for each subject. The subjects knew that a stimulus was being presented only because they were told so by the experimenter. They were unable to report seeing anything in the visual field. Dixon also allowed his subjects a potentially infinite range of verbal response categories. A signal was given before each stimulus presentation, and the subject was instructed to respond with any word that came to mind. The stimuli used were threat and neutral words. A GSR measure was taken at each stimulus presentation. The results indicated that subject's verbal responses bore no structural similarity to the word stimuli. All subjects had greater GSR response to the threat stimuli as compared to the neutral stimuli.

Following the perception phase of the experiment, Dixon presented the subjects with printed lists of the stimuli and verbal responses. The accuracy of the stimulus-response matchings was significantly better than would be predicted by chance. On the basis of his results, Dixon concludes that the ability to verbalize a recognition of the stimulus cannot be taken as the sole criterion of awareness. Both autonomic discrimination and verbal awareness may have thresholds below a verbal recognition response. Dixon's results are based upon seven subjects only and need, therefore, further substantiation.

Discussion. The preceding review of the experimental literature has indicated two theoretical views to account for the subception phenomenon. One view considers the autonomic or affective discrimination to be based upon a direct response to the threatening aspects of the stimulus. Such a response either acts independently of higher levels of cortical functioning or tends to disrupt them. In the second view, the autonomic response is thought to be mediated by a conscious, though partial recognition of the stimulus rather than by unconscious processes. This latter view has received the most experimental support. However, a recent experiment has placed the theory of partial recognition in question. Dixon (1957) was able to demonstrate both an autonomic discrimination and a verbal discrimination at stimulus magnitudes below verbal awareness. His results indicate the need for further research dealing with so called unconscious processes in perception.

Regardless of which theory ultimately proves to be correct, the concept of subception remains a plausible explanation of how the or-

ganism knows what stimuli to avoid. Such a concept does not explain the greater responsiveness shown by certain subjects to threatening stimuli. This might be done by subsuming the concept of perceptual vigilance under the general rubric of defense. The treatment of perceptual vigilance as defensive behavior will be discussed in greater detail in the next section on perceptual defense.

Perceptual defense. In their study of personal values, Postman, Bruner, and McGinnies (1948) also introduced the term perceptual defense to describe the elevated recognition thresholds for words related to areas of low value as determined by the Allport-Vernon Scale of Values. It was not the higher recognition thresholds that prompted the introduction of this concept, but rather, the type of pre-recognition hypotheses or guesses prior to recognition that suggested an active avoidant process for such words. The pre-recognition hypotheses were categorized in terms of the relative degree of similarity to the actual stimulus. Analysis of the pre-recognition hypotheses revealed that more nonsense words or words of opposite value occurred as pre-recognition hypotheses to low value areas than to high value areas. From this analysis the authors concluded that subjects made an active effort to avoid recognition of low value stimuli.

A subsequent experiment by Bruner and Postman (1947) added support to the concept of perceptual defense. However, this study was published first and was ignored by later experimenters whose interest was in the above "values" experiment. In their 1947 study, Bruner and Postman used stimulus words considered to have threat value for individual

subjects because of long reaction times to such words on a word association test. A positive relationship was found between reaction time on the word association test and perceptual recognition thresholds. While most subjects had higher recognition thresholds for threatening stimuli, some subjects again showed consistently lower thresholds or perceptual vigilance for such inimical stimuli. This result was also ignored for some time as interest became centered on an independent study by McGinnies.

In a much criticized experiment, McGinnies (1949) used the so called "taboo" words as stimuli. Subjects were found to have significantly higher recognition thresholds for the taboo words than for neutral words. This experiment did much to give to the concept of perceptual defense an existence as a special perceptual mechanism and at the same time, it precipitated numerous criticisms asserting that a concept of perceptual defense was unwarranted.

Howes and Solomon (1950) suggested that two simple processes could account for the results of the McGinnies experiment. The first was the factor of word frequency. The authors subsequently demonstrated the effect of this variable on recognition thresholds. The second factor was that of response suppression. It was suggested that responses to taboo words are not delayed in recognition but are merely delayed in verbal report. A number of experiments followed substantiating the proposed existence of response suppression to the so-called taboo stimuli.

Lacey, Lewinger, and Adamson (1953) divided subjects into three

groups on the basis of the amount of information received in the instructions concerning taboo words. They found that taboo words are recognized more quickly when subjects are forewarned that taboo material will be used in the experiment. An habituation effect was also noted, that is, with successive presentations of the taboo words, the thresholds tend to become lower. It was concluded that instructions change the relative dominance of certain sets in the subjects.

Freeman (1954) in his first study performed two experiments. In the first, he varied the threat expectancy of his subjects. He found that the expectant group had lower thresholds for both neutral and taboo words. An habituation effect was also noted. In the second experiment, he changed the first letter of the taboo words making them taboo-similar. Subjects were then forewarned to expect taboo words. He found that a type of vigilance seemed to develop to all taboo-similar words following the incorrect perception of a taboo-similar word as a taboo word. This finding gave confirmation to an interpretation of the results in terms of dominance of alternative sets which predispose the subject towards certain types of stimuli.

In a further experiment, Freeman (1955) used separate groups of males and females. Threat expectancy was varied, and subjects were also given ego involving instructions. They were led to believe that the perceptual task was related to academic success. Raised thresholds for taboo words were found in the uninformed group, but there was no significant difference between taboo and neutral thresholds in the informed groups. Informed females showed less reduction of thresholds

for taboo words than did males. Ego involvement had the effect of reducing all thresholds, neutral as well as taboo. This effect was more pronounced for the females than for the males. These studies again confirmed the hypothesis that recognition thresholds are a function of the dominance of alternative sets.

Postman, Bronson, and Cropper (1953), in a carefully controlled study used four different sets of instructions to manipulate the subject's readiness to report taboo material. Sex of the experimenter and the subject were also systematically varied. The thresholds for taboo words were found to be lower than for neutral words for all four experimental groups. Both the taboo and neutral words had been equated for frequency. The authors hypothesized that the lower thresholds for the taboo words might be due to an underestimation of the frequency counts of such words. The relative thresholds varied significantly with the type of instructions. The group receiving instructions to facilitate the report of taboo words had the lowest thresholds for such words, while the uninformed group had the highest thresholds. The relative thresholds were not significantly different in the presence of an examiner of the opposite sex as compared with an examiner of the same sex. An analysis of the pre-recognition hypotheses failed to confirm earlier findings of differences in subject's guesses to taboo and neutral words. The authors suggest that even if differences in pre-recognition hypotheses are found, these differences can be as equally well ascribed to the uncontrolled variations in word frequency as to a defense concept. Because of the unexpected direction of their findings,

they were forced to conclude that perceptual defense has at best, the status of an unconfirmed hypothesis.

Stern (1952) used personally relevant threat words of a non-taboo variety to avoid possible response suppression. The threat words were equated with neutral words for frequency. A comparison of recognition thresholds for emotional and neutral words revealed no evidence to support the concept of perceptual defense. Analysis of pre-recognition hypotheses did show that subjects used more nonsense and contravaluant words as guesses to emotional stimuli than to neutral stimuli. Similar findings were reported by Wylie (1957). Threat was associated with certain numerical stimuli by placing subjects in a failure situation involving arithmetic tasks. No significant differences were noted in recognition thresholds for the threat and neutral stimuli. A difference was found between pre-recognition guesses to the threat and neutral stimuli.

In general, the analysis of pre-recognition hypotheses has been presented in addition to threshold data to lend more support to the concept of perceptual defense. This factor has been ignored by most experimenters attempting to account for variations in recognition thresholds by the perceptual principles of word frequency or response set. The concept of perceptual defense could be posited on the basis of pre-recognition hypotheses, but it would be in a rather weak position when no differences are found in recognition thresholds. This would indicate that the defensive technique is unsuccessful in its efforts to avoid certain stimuli. On the other hand, if it can be

shown that pre-recognition hypotheses to threatening and neutral stimuli are not different, this finding would still not be crucial to the defense concept. It could be argued that pre-recognition hypotheses similar to the actual stimulus still permit the individual to avoid the real stimulus. As yet, there has been little systematic investigation of the pre-recognition factor as a major variable in perceptual defense.

Some experiments have been reported which attempt to control for one or both of the response suppression and frequency variables while claiming to demonstrate perceptual defense. Cowen and Beier (1950, 1953, 1954) used essentially the same design in three experiments in an effort to demonstrate the existence of such a concept. Subjects were required to examine mimeographed booklets in which increasingly clear versions of a word appeared as each page was turned. The booklets contained taboo and neutral words. One group was informed that taboo words would be presented, the other group remained uninformed. In the first two studies, the authors failed to equate for the frequency variable. They also went to considerable effort to interpret their results in favor of the defense concept when the data seemed more clearly to support the response suppression hypothesis. One interesting finding did result from the first two studies. The individual and group variance for the informed subjects was significantly greater for the taboo words than for neutral words. The variance was also significantly greater when compared with the variance of the uninformed group for the taboo words. This result suggests that alerting subjects to expect taboo words has the effect of lowering thresholds to such words

for some subjects but not others, or leads to a differential intra-subject response to the taboo stimulus category. It is possible that response suppression still has an effect even though subjects are alerted to expect taboo words, or perhaps the frequency variable has a differential effect on the various taboo words.

In their third experiment, Cowen and Beier (1954) controlled for both response suppression and the frequency variable. They found that more time and trials were required to report the taboo words than the neutral words for both the informed and uninformed groups. The greater time spent in reporting taboo words again suggests the operation of response suppression. However, the writers feel that an explanation of their results in terms of conscious inhibition is inadequate. At best, their results remain equivocal but show what can be done with little data when an experimenter is really trying to support a particular hypothesis.

Newton (1955) attempted to avoid the problem of response suppression by using pleasant and unpleasant words of a non-taboo variety. The words were also equated for frequency. He found that significantly less recognition errors were made to the pleasant as compared to the unpleasant words. Wiener (1955) controlled for word frequency and response suppression by using non-taboo words in a threat and non-threat context. The same words were used in both contexts. Selective set was controlled by also placing "neutral" stimuli within the threat context. If selective set was operating for the critical words in the threat context, then raised thresholds would be expected for the

neutral words. This did not occur. The threat group had significantly lower thresholds for the critical words than the non-threat group. This result was opposite of the direction predicted. However, since the frequency hypotheses would predict no differences in thresholds for the critical stimuli while a motivational hypotheses would, the author interprets this as evidence in favor of a motivational determinant of perception. The results reported in this study are similar to those found by Postman et al. (1953) and suggest a vigilance effect to threatening stimuli.

De Lucia and Stagner (1954) replicated the earlier Bruner and Postman (1947) study of emotional selectivity in perception. They used an analysis of variance technique which permitted an analysis of the main effects of the variables of word frequency and degree of threat as measured by reaction times on a word association test. They found that both word frequency and degree of threat had a significant effect on recognition thresholds, a result supporting both the Solomon & Howes (1951), and Bruner-Postman (1947) experiments. Again, some subjects had lower thresholds for words eliciting long reaction times on the word association test.

De Lucia and Stagner posit a linear function for recognition thresholds in relation to frequency, which probably represents the trend for all words. Deviations from this trend occur when a word of defined frequency is found to have recognition times either in excess of or shorter than that predicted on a frequency basis. De Lucia and Stagner preferred to discard the mechanism concept of perceptual defense

and speak of the homeostatic aspects of human behavior. In some instances the homeostatic relationship is furthered by the rapid perception of certain stimuli, in others, the percept may arouse other associative responses than the mere naming of the word which would tend to interfere with the verbal response. These writers would still be faced with the problem of predicting under what conditions either vigilant or avoidant behavior would occur.

Osler and Lewisohn (1954) used words classified as "acceptable" or "unacceptable" to test recognition thresholds. The words were equated for frequency and structure, except for one letter. Examples of the words used are: tit -- tat, and bitch -- botch. High and low anxiety groups as measured by the Taylor Anxiety Scale were used as subjects. The low anxiety group showed no significant differences in recognition thresholds between acceptable and unacceptable words. In the high anxiety group, the recognition thresholds for the unacceptable words was found to be significantly lower than for acceptable words. It was concluded that anxiety is related to perceptual vigilance.

McGinnies and Sherman (1952) stated that what was needed was an experimental demonstration of behavior that was clearly a reflection of differential perceptual organization rather than selective verbal report. Eighteen neutral words equated for frequency were used as the task stimuli. Four taboo and four different neutral words were presented to subjects at easily recognizable exposures. One of the four taboo or neutral words was first presented at an exposure speed which permitted veridical report. Immediately following this presentation,

a task word was flashed at a speed below veridical threshold. The sequence was repeated, gradually increasing the exposure time of the task word until the subject was able to identify it. Recognition thresholds for the task words following the supraliminal presentation of the taboo words were significantly higher than the thresholds for the task words following the presentation of neutral words. The writers concluded that the disrupting effect of anxiety in relation to the taboo word is still present when a second stimulus is immediately presented and results in a raised threshold for the succeeding stimulus. The concept of perceptual defense is then treated in terms of reinforcement theory. Verbal responses involving taboo symbols have for most subjects been punished by external figures. Taboo words then become a negative reinforcing agent. When presented as stimuli they signal an approaching state of punishment and, thereby, become cues for eliciting the anxiety associated with actual punishment. It had previously been shown that the threshold for an anxiety response is lower than the threshold of veridical recognition. The autonomic cues are apparently adequate to initiate a perceptual avoidance reaction. This avoidance reaction is accomplished by distortion of the stimulus as evidenced by the pre-recognition hypotheses and by elevated recognition thresholds. The avoidance response reduces anxiety and is thereby reinforced.

Eriksen and Browne (1956) have recently presented a similar theoretical analysis of perceptual defense in terms of principles derived from punishment and avoidance conditioning. One factor that early studies dealing with perceptual defense had in common was the

assumption that all subjects would react to threatening stimuli in perception with avoidance behavior. Explanations in terms of learning principles would adequately account for such avoidant behavior. However, in many experiments the opposite of avoidance occurred. Subjects showed an increased responsiveness to threatening stimuli. Theory based on conditioning principles did not account for this behavior. Eriksen and Browne (1956) were aware of this and limited the application of their analysis to those subjects known to deal with threat by avoidance behavior. The contradictory experimental results created the necessity for determining more adequate methods of predicting perceptual response. One approach to this problem has resulted in an emphasis upon personality factors in perception.

The personality-centered approach. Lazarus (1954) and Eriksen (1954), while favoring the perceptual defense concept, criticized many of the previously cited experiments as being inadequate to demonstrate the concept. Drawing more heavily from the concept of defense as presented in psychoanalytic theory, they presented what they felt were the necessary methodological requirements to adequately test for such a concept. It is necessary to show, first, that the stimuli are anxiety producing for all subjects, and second, that the subjects have learned to deal with anxiety from this particular source by repressive or avoidance defenses. By using taboo words, the experimenter is making the gratuitous assumption that these words are anxiety producing for all subjects. It is also impossible to determine if the performance is due to the emotional characteristics of the stimulus or to other factors such as

word familiarity, context, response set, or values. The above authors have conducted a number of experiments using the more personality-centered approach to perception.

Eriksen (1951), using the TAT to detect areas in the personality where defense might occur, found that subjects who blocked or showed emotional disturbance to the TAT cards usually eliciting aggressive themes had higher recognition thresholds for aggressive scenes when presented tachistoscopically, than did subjects who expressed aggressive themes freely. In a further experiment, Eriksen (1951) used three psychiatric populations as subjects. Two groups, schizophrenics-paranoid type, and chronic alcoholics were chosen because they are considered to have unacceptable succorant and homosexual needs. A third group was made up of other diagnoses to represent a miscellany of other unacceptable needs. Subjects were then administered a word association test. He found that a disturbance on the word association test was positively related to recognition thresholds for scenes depicting persons in the act of expressing or gratifying the corresponding needs. An analysis of the pre-recognition hypotheses revealed a tendency for subjects who showed disturbance in a particular need to distort scenes corresponding to this need area so as to remove the threat. This distortion did not occur for all subjects nor for all need scenes for a given subject.

Eriksen's results suggest a consistency of avoidance defense from verbal behavior to perceptual behavior. This finding differed from the earlier studies in which disturbance on the word association test was

related to deviations in recognition thresholds either above or below the thresholds for neutral stimuli.

Support for defense consistency came from another experiment by Eriksen (1952) in which he first obtained a measure of recall of completed and incomplete tasks in a failure-induced situation. He found that those subjects who reacted to induced ego threat by forgetting their failures had higher recognition thresholds for failure related perceptual stimuli. Only those subjects who showed an avoidance type of defense in the memory task showed perceptual defense. In both situations the response was to avoid recognition of the stimulus, to keep it from awareness.

A number of experiments have been performed using nosological categories as a basis for predicting perceptual behavior. Lazarus, Eriksen, and Fonda (1951) used hysteric and obsessive-compulsive patients as subjects. According to psychoanalytic theory, the major defense of the hysteric group is repression. Consequently, it was predicted that this group would show perceptual defense. The obsessive-compulsive group is considered to use intellectualizing defenses in dealing with conflictual stimuli. Since this latter group is able to deal more freely with certain aspects of impulse expression, it was predicted that this group would not show avoidance in perception. The predictions were confirmed. Subjects using the intellectualizing defenses perceived the stimulus material significantly more accurately than did subjects using repressive defenses. The authors suggested that individuals may have a generalized method of responding to threat.

A disturbance in one area does not necessarily mean a disturbance in another area, but when this does occur, the same defense appears to be utilized.

Daston (1956) found that paranoid patients had lower thresholds for homosexual words than did other types of schizophrenics. Lindner (1953) reported that sexual offenders had lower recognition thresholds for sexual pictures as compared to other types of criminals. Stein (1953) using neurotic patients was able to classify them as either defenders or sensitizers on the basis of deviations in recognition thresholds for conflictual material as compared to neutral material. Subjects then showed a consistent use of either perceptual defense or sensitization to a subsequent series of pictures depicting aggressive and neutral scenes.

The nosological approach to perception did not go unchallenged. Kurland (1954) failed to find significant differences in recognition thresholds for threat words between hysteric and obsessive-compulsive patients. As a possible explanation of his results, Kurland suggested that many of his subjects in the patient groups might have been sensitized to the emotional stimuli as a result of psychotherapy. The data was further examined for a differential response related to the type of conflictual stimuli. No significant differences were found.

Bitterman and Kniffin (1953) studied the perceptual behavior of high and low anxiety subjects as determined by the Taylor Manifest Anxiety Scale. No significant relationship between anxiety level and recognition thresholds was found. A significant difference in threshold

between neutral and taboo words was found and was interpreted in terms of differential readiness to report rather than in terms of perceptual distortion. Spence (1957) also attempted to relate anxiety level to avoidance and vigilance in perception. He found that subjects tended to use both types of behavior and could not be labeled specifically as either avoiders or sensitizers.

An experiment by Chodorkoff (1956) also failed to support a view of defense consistency. He found that the degree of threat or word stimuli as measured by reaction times on a word association test was not related to avoidance behavior in perception. A significant relationship was found between the degree of threat to certain words and the degree of deviation of recognition thresholds for such words either above or below recognition threshold for neutral words. Some subjects who had long reaction times to certain words on a word association test showed greater responsivity to those words perceptually than to neutral words. Other subjects had higher recognition thresholds for threatening words than for neutral words. A subject's perceptual behavior could not be predicted from a knowledge of his performance on a word association test.

A measure of self-adjustment was also obtained using the Q technique. Level of adjustment was significantly related to the degree of threshold deviation for the threatening words, disregarding direction, as compared with the threshold for the neutral words. Chodorkoff considered level of adjustment to be the variable which determined whether perceptual defense or vigilance would occur. The better adjusted sub-

jects tended to use vigilance to deal with threatening stimuli. The question might be raised, however, as to why the better adjusted subjects showed long reaction times to certain words on the word association test. Is the test inadequate as a measure of subjects' defenses, or do subjects vary in behavior from one situation to the next? To answer these questions, other instruments were devised to determine subjects' defense mechanisms in dealing with threatening stimuli.

A study which exerted a significant influence on later experiments dealing with perceptual defense was reported by Goldstein (1952). He devised an instrument called the Defense Preference Inquiry which he used in conjunction with the Blacky Pictures (1949) to obtain a measure of the subject's defense methods in dealing with material related to the various stages of psychosexual development as presented in psychoanalytic theory. Goldstein found that the majority of his subjects tended to choose a variety of defenses across the psychosexual dimensions. However, a significant minority tended to choose the same defense, regardless of conflict dimensions. The former group he labeled "specific defenders", and the latter group "general defenders". The general defenders also showed more disturbance in their spontaneous stories for the Blacky Pictures.

Goldstein's finding offered a possible explanation for the contradictory results reported in the various experiments on perceptual defense. Some of the subjects in these experiments may have fallen within a specific defender group while others may have belonged to the general defender group. Subjects in the former group might then show perceptual

defense for certain stimuli and vigilance for others. Different types of stimuli although falling within the "threatening" or "emotional" category might have, on this basis, led to differential results.

A few studies have been reported in which the Defense Preference Inquiry was used to determine subjects' defenses to psychosexual conflicts. The hypotheses tested were based specifically upon psychoanalytic concepts. Blum (1954) investigated both vigilance and defense in perception. He stated that since warded-off instincts continue to strive for discharge, they tend to utilize derivatives in an effort to gain indirect expression. The individual is, therefore, responsive to environmental cues relevant to impulse expression. This responsiveness he termed perceptual vigilance. His use of the term differs from previous definitions in that it refers to a discrimination of conflictual stimuli below the level of verbal awareness. Blum's definition of vigilance corresponds more closely with subception as has previously been discussed. Vigilance, in its more accepted meaning, refers to lowered veridical thresholds for inimical stimuli. Blum further stated, that at the more conscious level actual impulse expression or its derivatives are subject to ego defenses, because of the anxiety evoked. By controlling the subject's verbal awareness to anxiety-producing stimuli, demonstrations of vigilance (subception) and defense were attempted.

Four reproductions of the Blacky Pictures were used as stimuli. Two of the pictures were used as distractors; the other two consisted of one conflict-related picture and one neutral picture. The stimuli were arranged on cards so that each picture appeared in the same posi-

tion (top, bottom, right, and left) an equal number of times. The experiment was then divided into a subception phase and a defense phase. In the subception phase, subjects were given a series of trials both before and after a situation considered to arouse feelings of anxiety in relation to certain psychosexual conflicts. Four pictures were presented simultaneously at each trial, and the subjects were required to call which position stood out the most or was clearest. It was found that the conflict-related stimulus was called significantly more often in the second series of trials although both had been presented below the level of "conscious" awareness. This was interpreted as vigilance, or more aptly, subception to cues relevant to the threatening impulses.

In the defense phase of the experiment, the exposure time was increased, and the subjects were required to locate both the neutral and conflict-related stimulus. This exposure time was assumed to represent a high level of awareness. It was hypothesized that at this level the ego defense would operate. Blum found that subjects made significantly more errors in locating the conflict-related stimulus than were made in locating the neutral stimulus. The results were interpreted in favor of the concept of perceptual defense. In a second experiment, Blum (1955) used essentially the same design but controlled more carefully for selective verbal report, familiarity, set, and antecedent conditions. A variant in this experimental design permitted him to show more clearly that defensive behavior could be traced to the perceptual process itself. Subjects were led to expect that all eleven Blacky Pictures would be presented tachistoscopically, but actually only

four of them were shown repeatedly. In the defense phase of the experiment, subjects were asked to name which Blacky Pictures appeared in two of the four positions indicated by the experimenter. Responses were classified as to whether the pictures called by the subjects were present or absent and whether the subject used avoidance as a defense in relation to the particular psychosexual dimension. Subjects avoided calling the names of pictures related to their own conflicts, but only when these pictures were actually presented. No avoidance occurred for the neutral pictures, when they were actually presented. Blum concluded that it was the subliminal presentation of the conflictual stimuli which led to perceptual defense.

Nelson (1955) using Blum's design, studied the perceptual behavior of subjects classified as having high or low conflict to the psychosexual dimensions represented by the Blacky test. Each subject was given a high or low conflict score for each psychosexual dimension as well as a specific defense preference for each dimension. Subjects classified as high conflict-repressors showed significantly more avoidance behavior in perception than subjects of low conflict-other defense preferences. He noted that subjects favoring projection as a defense to a particular dimension tended to call the stimulus related to that dimension more often. On the basis of this behavior, Nelson suggested that projection may take quite the opposite direction of perceptual defense. He concluded that the perceptual process could be related to specific personality dynamics of the individual and emphasized the value of psychoanalytic theory as a basis for research in perception. In most

of the experiments dealing with perceptual defense, no explicit reference was made to psychoanalytic theory as a basis for hypothesis formulation. Even Blum (1955) and Nelson (1955) who did make specific reference to psychoanalytic concepts considered vigilance to be the antithesis of defense. Chodorkoff (1956) had suggested that the better adjusted individuals tend to show perceptual vigilance to threatening stimuli. Neel (1954) found that subjects who had little conflict in areas of sex and aggression showed vigilance to stimuli related to mild sexual behavior but avoidance to stronger or more definitely sexual stimuli. The opposite reactions occurred to mild and strong aggressive stimuli. The high conflict group was less consistent but tended to use avoidance to all types of sex and aggressive stimuli. These contradictory results indicate the need for a better understanding of the defense mechanisms.

Psychoanalytic concepts of defense. This discussion will, for the most part, be based on the psychoanalytic theory of defense as presented by Fenichel (1945). Defense, as has previously been stated, refers to the various operations by which the individual attempts to avoid or deal with the anxiety associated with instinctual expression. As an infant, the organism is biologically helpless and, therefore, requires external objects to satisfy instinctual demands. The external objects are not always present so that the child is placed in a helpless position in which he experiences pain. Experiences of this kind are considered to lead to the first impression that instinctual impulses are also a source of danger. This impression is further reinforced by threats and

punishments from parental figures during the child's development. These threats are effective because the child is also dependent upon parental figures for maintenance of self-esteem. In order to avoid feelings of anxiety, guilt, and the subsequent loss of self-esteem, the individual blocks the discharge of certain instinctual impulses. The warded-off instincts continue to strive for expression and often become associated with other objects, attitudes or impulses in an attempt to gain indirect discharge. These substitute feelings or impulses are termed derivatives. If instinctual expression via the derivatives also becomes anxiety producing then the derivatives are defended against. Certain perceptual stimuli may constitute a part of the anxiety producing derivatives. Then, defenses are established against painful perceptions just as there are defenses against anxiety-producing instincts.

Freud (1959) first held repression to be synonymous with defense. He distinguished between two types of repression. The more basic, he called primal repression, which referred to the denial into consciousness of an instinct. The second was termed repression proper, which is the pushing into the unconscious the derivatives associated with primal repression. Fenichel (1945) prefers to call the first "repression proper" which represents a continued counter-cathexis against the instinct, and the second, "secondary repression" which represents a defense against derivatives. Freud later changed his view concerning repression and considered it to be but one of a number of techniques which might be utilized by the ego to protect itself from threat.

Anna Freud (1946) emphasizes this latter view. Defense is a general designation for all the techniques used by the individual, whereas repression refers to a specific method of defense. She further states:

"At particular periods in life and according to its own specific structure, the individual ego selects now one defensive method and now another....these it can employ in its conflicts with instincts and in its defense against the liberation of affects".

This statement implies that the individual may use various methods of defense against instincts and their derivatives. Some of these other techniques of defense are termed: projection, reaction formation, isolation and intellectualization, which is a particular form of isolation. These methods of defense permit the individual to avoid the oft-repeated acts of secondary repression. Of all the various techniques of defense, repression, projection and intellectualization would seem most likely to produce effects in perceptual behavior.

In repression, the external stimulus is warded off just as the threatening instinct is warded off. In projection, the offensive impulse is perceived in another person rather than in ones self. The individual is sensitized to an external threat in place of anxiety or guilt associated with instinct expression. It is this sensitivity to the external world that might be reflected in perceptual behavior. Isolation and its variant intellectualization could possibly have two different effects upon perceptual behavior. Through the use of this defense, the derivatives are freely admitted, but the emotional or affective components have lost their connection. It becomes possible to tolerate many aspects of ones impulses that would be extremely dis-

gressing otherwise. On the one hand, isolation may lead to a disinterest in common external objects or stimuli in favor of more abstract pursuits. On the other hand, it may lead to a heightened sensitivity to external stimuli because it may freely deal with such stimuli due to the emotional detachment. Psychoanalytic theory would certainly suggest that maladjusted individuals could show vigilance to threatening stimuli rather than avoidance behavior. It also provides some hypotheses concerning the type of individual who may be expected to show vigilance in perceptual behavior. Psychoanalytic principles have led to a consideration of avoidance and vigilance behavior as methods of defense in dealing with conflictual stimuli.

Perceptual defense as avoidant and vigilant behavior. The view of vigilance as defensive behavior was presented by Wiener, Carpenter, and Carpenter (1956) in a study attempting to devise a method for determining subjects' defense mechanisms to various areas of conflict. Vigilance was termed a method of defense and defined as a heightened awareness which operates when the environment suggests the presence of a threatening stimulus. The individual is sensitive to the conflictual stimulus but to decrease the anxiety aroused by it, he changes the significance of it through intellectualizing, undoing, or projection. The authors were also influenced by Goldstein's (1952) findings that there were intra-individual differences in defense when dealing with various areas of conflict.

On the basis of a sentence completion test containing sexual and aggressive stems, Wiener et al. (1956) classified subjects into four

groups: hostility repressors, hostility sensitizers, sex repressors, and sex sensitizers. An individual subject, for example, might be classified as a sex repressor and a hostility sensitizer, or he might use either repression or sensitization for both areas of conflict. A large minority did tend to use the same defense for both areas. It was concluded that there would be little improvement over chance in attempting to predict any one subject's mode of defense in a particular area from knowledge of his defense in another area of conflict.

In a further study, Carpenter, Wiener, and Carpenter (1956) predicted perceptual behavior from the subject's method of defense used on the sentence completion test. Using the blurred booklet technique in which successively clearer presentations of words appear as the pages are turned, it was found that subjects classified as sex sensitizers recognized words related to sex significantly faster than those subjects classified as sex repressors. The same results were found for the area of hostility. The results of this study emphasize the need for an accurate and independent measure of defenses before predicting perceptual behavior.

A further question concerning perceptual defense had been introduced by Binder (1958), calling for a renewed consideration of response suppression. The experiments just reviewed, all used stimuli for which there was no reason to assume that subjects would delay report. Binder's findings suggest that this assumption may not always be correct. He used subjects scoring high on various scales of the MMPI. He then tested for the relationship between the amount of cue information accum-

ulated prior to the recognition response and the personality variables as measured by the MMPI. For the recognition task, he used a sequence of test figures which provided more cue information with each successive exposure. The figures carried no emotional or threatening components. Each figure was labeled, and subjects were given label to figure paired associate learning to criterion. The figures were then presented tachistoscopically, each presentation giving more cue information concerning its identity. The longer a subject waited before labeling the figure, the higher was his recognition score. A significant relationship was found between high scores on the Paranoia Scale (Pa) of the MMPI and recognition scores on the perceptual task. Binder concluded that the increasing distrustfulness and suspiciousness of high Pa individuals carries with it a tendency to give recognition responses only after a relatively large number of cues are accumulated.

Binder's findings would certainly suggest that a delay in report to ambiguous stimuli is related to certain personality characteristics even though such stimuli are not of the socially disapproved variety. This would apply particularly to subjects classified as obsessive-compulsive or sensitizers. The former group is known to have conflicts over self-expression and would be expected to show hesitancy in committing themselves in ambiguous situations. Subjects classed as sensitizers often show obsessive or compulsive characteristics and might also show hesitant behavior. Yet, in some experiments just reviewed, these subjects were found to have lower recognition thresholds for conflictual stimuli. Perhaps, it is the emotional or threatening elements in the

stimuli that constitute the crucial variable leading to a lower threshold in ambiguous situations. A replication of Binder's experiment using figures which also had emotional connotations might support such an hypothesis. Binder's study does suggest that the response suppression variable may not be as easily controlled as has previously been thought.

In a recent critique, Goldiamond (1958) has focused attention upon the indicators of perceptual response. He questions the validity of such response measures as phenomenal report and the forced-choice accuracy indicator, and proceeds to illustrate the types of response bias that can occur when using each type of measure. His criticism is quite pertinent, and there is little doubt that the results in many experiments dealing with perceptual defense can be explained in terms of response bias related to the particular measure of perception being utilized. Such criticism indicates the need for greater methodological rigor and an increased emphasis upon the use of psychophysical research in studying motivational variables in perception.

Discussion of perceptual defense. In spite of efforts to minimize the concept of defense as a perceptual problem or to subsume such behavior under more general principles of perception, a substantial body of experimental data still exists to support the plausibility of such a concept. Criticism has brought to light some very crucial variables and has led to much improvement in experimental methodology.

The most promising trend appears to be the one in which personality variables are related to the perceptual process. The proponents of the personality-centered approach have limited their view of percep-

tual defense to avoidant behavior. Although Lazarus (1954) and Eriksen (1954) have explicitly stated that subjects may use ego defenses other than repression when dealing with threat, they also limited their view of perceptual defense to avoidance behavior. Such behavior did not always occur in response to threatening stimuli. Many subjects showed a vigilance response to threat. Chodorkoff (1956) had reported that the better adjusted subjects tended to use vigilance in dealing with threatening stimuli. Nelson (1955) suggested that subjects using projection as a defense might respond to the perceptual task in quite the opposite manner from subjects using repression as an ego defense. These differential results indicated the need for some external criteria from which specific perceptual response could be predicted.

Carpenter et al. (1956) attempted to treat both avoidance and vigilance in perception as a defense. However, these authors did not investigate the perceptual behavior of a group in which little defense to threat was inferred. Although they were able to predict avoidance and vigilant behavior in perception, they had little basis for concluding that both types of perceptual response represented a defense, since they failed to include a group which might be expected to show little defense in perception. This is especially important in view of Chodorkoff's finding that better adjusted subjects use vigilance in dealing with threatening stimuli. However, a defense approach does provide a plausible explanation for the occurrence of both types of perceptual behavior to threatening stimuli.

In the present investigation, a more specific study of the ego

defenses and their relationship to perceptual behavior was attempted. It has been suggested by some critics that continued experimentation dealing with motivational variables merely adds to the existing plethora of experimental data, but does little to increase our knowledge or theory of perception. Since perceptual theory faces the problem of accounting for individual differences, whether they be included or minimized in perceptual experimentation, a systematic study of the conditions under which such differences occur is still of major importance. This type of research can lead to the resolution of existing contradictions and provide the groundwork for dealing with thorny problem of the mediating mechanisms of motivational variables in perception.

THE PURPOSE OF THE PRESENT INVESTIGATION

The present study had a twofold purpose. First, it was designed to investigate the subception concept under conditions which were considered to be a more adequate test of so called "unconscious" discriminations. Secondly, an attempt was made to extend the concept of perceptual defense to include both avoidant and vigilant behavior.

From the foregoing review of the literature, it was noted that two theories of subception had evolved, with supporting experimental data for each. The first theory recognizes two processes in perception, the affective and veridical. The second theory accepts only the veridical process in perception. Proponents of the dual process theory of subception first postulated that affective perceptual discriminations occur at "unconscious" levels and are more precise than veridical discrim-

inations. It was further hypothesized that affective discriminations involve lower centers of cortical integration and function either independently or tend to disrupt higher levels of cortical integration.

In order to avoid the assumption of "unconscious" processes, a variation of the dual process theory was presented, which accounts for subception in terms of the partial information afforded by the stimulus. This partial information elicits the affective response which in turn either facilitates or disrupts the categorization or integrating mechanisms in veridical discrimination. The most recent variation of dual process theory considers affective and veridical discriminations to be concurrent response systems, neither of which is more accurate than the other.

The theory limiting perception to a veridical process states that perception is dependent upon the individual's particular hierarchy of response hypotheses which are based upon his past experiences. The more dominant an hypothesis in the individual's hierarchy, the less stimulus information is needed to confirm it, and subception seems to occur. When the stimuli are related to less dominant hypotheses, more stimulus information is needed to produce shifts in the hierarchy, resulting in raised veridical thresholds or perceptual defense. Motivational variables serve in determining the individual's particular response hierarchy.

Discrepancies in research data and subsequent differences in theory are related in a large part to the difficulty of defining perceptual thresholds. "Awareness" or veridical thresholds have been defined

generally in terms of the stimulus magnitude which permitted subjects to make total identification of the stimuli. Stimulus magnitudes below this level were considered to be below awareness and have also been given the term "below consciousness". However, it has been demonstrated that awareness is a continuous variable and not a discrete "information-no information" category.

A consideration of awareness as a continuous variable poses certain problems. Most subception experiments have used the degree of asynchrony between a verbal accuracy measure and an autonomic response measure as evidence for the subception phenomenon. This autonomic response has been termed the affective discriminatory process. Blum (1954) and Dixon (1958) have also reported the subception effect, using a verbal accuracy measure. Their results suggest that subception might be more than an affective process and could involve higher centers of cortical integration. The question arises as to which is the most adequate indicator of subception. Also, is there more than one type of response involved, and where along the awareness continuum does subception begin or cease to operate? Blum and Dixon employed their verbal indicator at stimulus magnitudes at the extreme, low end of the awareness continuum. On the other hand, Voor (1956) found that as the lower end of the continuum was approached, the autonomic response was no longer elicited. Using an autonomic indicator at stimulus magnitudes permitting from 50% to total identification, subception has been demonstrated, but when a verbal accuracy indicator is used at such stimulus magnitudes, the result is perceptual defense.

It is apparent that a more systematic approach to the study of perception is needed, with explicit emphasis placed upon the awareness variable and the types of indicators used to measure subception. A starting point would be to test for the subception phenomenon under stimulus conditions representing the lowest extreme of the awareness continuum, using both a verbal and an autonomic measure. Such a test would appear to be crucial to a theory of "unconscious" perceptual discrimination. Dixon (1958) conducted such a study and obtained significant results. However, his results were based upon data obtained from only seven subjects, and his experimental design is subject to certain methodological criticisms. He does not indicate whether the conflict and neutral word stimuli were equated for length, or frequency of usage in the English language. The possibility also exists that his verbal accuracy indicator was subject to response bias. If Dixon's results could be substantiated under more adequately controlled experimental conditions, this would tend to place other theoretical views which explain subception in terms of partial awareness or strict veridical processes in serious question.

The first part of the present experiment was designed, therefore, to test for the subception phenomenon under stimulus conditions similar to those used by Dixon. The stimulus conditions represent the extreme lower end of the awareness continuum at which no information is available to the subject as measured by phenomenological report. A more direct and immediate verbal accuracy indicator was used to test for perceptual discrimination. This part of the experiment was also de-

signed to control for the usual sources of response bias such as stimulus frequency, differences in visual acuity, and response suppression.

The second purpose of this investigation was to broaden the concept of perceptual defense to include both a heightened responsivity as well as avoidant behavior to threatening stimuli, when such stimuli are presented at magnitudes permitting a phenomenal report of awareness but below the level of total identification. The extension of the concept of perceptual defense to include both types of behavior could account in part for the contradictory results reported in the literature.

Perceptual defense and perceptual sensitization have been considered most often to be antithetical processes. This seems quite logical when sensitization refers to a heightened responsivity to stimuli related to values, interests, or acceptable needs. However, a heightened responsivity to threatening stimuli has also been demonstrated. There has been little attempt to differentiate this increased responsivity in terms of the stimuli eliciting such behavior. An initial effort was made to term the response to values or interests, perceptual sensitization, and to call the response to threatening stimuli, perceptual vigilance. However, these two terms continue to be used interchangeably, and the term vigilance has also been used in referring to subception.

The lack of differentiation between the two responses has led to a certain amount of confusion in the literature and to stated contradictions that actually do not exist. A distinction of response in terms of the eliciting stimuli would appear quite necessary. An active,

selective process may be operating to permit the individual to recognize value-related stimuli more quickly, but one could hardly infer such a process in relation to threatening stimuli unless such behavior were viewed within a framework of perceptual defense.

It has been emphasized that the concept of perceptual defense had its roots, at least implicitly, in psychoanalytic theory. Although it is recognized that this theory supports the view that individuals may use other mechanisms besides repression in dealing with threat, nevertheless, defense in perception has been restricted to avoidance behavior. Within the framework of psychoanalytic theory, the assumption that because an individual does not show avoidance in perception he is not showing defense is certainly questionable. From the previous discussion of the concepts of ego defense, it was suggested that persons using projection as a major defense, since they are considered to be more sensitive to the external environment, would show an increased responsivity to threatening stimuli in perceptual behavior. The defensive aspect of such behavior lies in the fact that it permits the individual to locate the source of threat as being external to the self, thereby, decreasing feelings of anxiety or guilt and maintaining self esteem. It was further suggested that persons using other mechanisms of defense, such as intellectualization or isolation might also show an increased responsivity in perception, although this need not necessarily be so. The present investigation represents an initial step toward a more systematic study of specific ego defenses in perception. It is focused upon subjects preferring avoidance and projection as the major defense techniques.

A study was reported by Carpenter, Wiener, and Carpenter, (1956) which attempted to treat both avoidance and vigilance in perception as a defense. Subjects were classified as either repressors or sensitizers on the basis of their responses to a sentence completion test, and the subsequent perceptual behavior was predicted. Although between group differences were significant in the predicted direction, the authors had no way of actually substantiating the defense hypothesis since they did not include a standard or control based upon the performance of a group showing little or no defense. Such a group would also be expected to have lower recognition thresholds than the repressor group. Not all subjects taking the sentence completion test were judged as having conflict and showing defense. A group of such subjects could have served as a control from which perceptual defense for both the repressor and sensitizer groups might have been inferred. Also, combining subjects using defense mechanisms other than repression would appear questionable in spite of the significant results. Such a combination assumes that the subjects compose a homogeneous group. Such an assumption seems unwarranted at present, especially in view of the fact that Goldstein, (1952) found an affinity between the use of avoidance and reaction formation defense. Subjects using the latter defense were placed in the sensitizer group in the Carpenter et al. study.

The position often taken is that all persons show some defense. However, if this position is broadened to the extent that it makes differentiation among individuals using the same defense impossible, then it becomes meaningless. In dealing with a so called "normal" college

population, it would seem justifiable to assume at least a phenomenological continuum of defensiveness, ranging from little or no defense to pathological defensiveness. Subjects at the lower end of this continuum might be expected to show less defense in perception and more flexibility in their approach to various types of threatening situations. Individuals at the more extreme end of the continuum should be more rigid in their use of defense, and the effects of such defensiveness should be demonstrable in numerous facets of the individual's behavior. Consequently, those subjects at the more extreme end of the defense continuum who used Avoidance and Projection as major defenses were selected for study. Subjects at the lower end of the continuum were selected to serve as a control from which defensiveness in perception might be inferred.

To select subjects on the basis of degree of threat and type of defense utilized, the Defense Preference Inquiry (Blum, 1956) was chosen (See method chapter). Using this assessment instrument, subjects may be classified as either "general" or "specific" defenders. The "general" defenders are considered to be more rigidly defensive and more maladjusted than the "specific" defenders. Consequently, the "general" defender would be expected to show defense in perception.

The term "specific" defender is a somewhat misleading one because it refers to the majority of college subjects on whom the instrument was used. Since the Defense Preference Inquiry is a forced-choice ranking technique, subjects must select a particular type of defensive behavior for each conflict dimension presented or else refuse the task.

It can hardly be inferred under these forced-choice conditions that the subject has conflict on each area presented and utilizes the type of defense chosen. The "specific" defender group actually represents a less defensive and better adjusted group than the "general" defenders and would be expected to show little defense in perception. From these considerations, the specific hypotheses were formulated to test for subception and perceptual defense.

More than a decade of experimentation using the "New Look" approach to perception has clearly demonstrated the multiplicity of variables affecting recognition thresholds. Goldiamond (1958) in an excellent review of the "New Look" methodology states that in almost every case, the experimental results can be accounted for in terms of response bias which is extraneous to perception. His criticism, in most instances, seems well taken.

It must be recognized that the individual enters the perceptual situation with certain built-in response biases as the result of past events and conditioning. It is not possible nor even desirable to eliminate these. In a perceptual experiment, the effects of response bias must be systematically examined. To do this, the experimenter must incorporate into his experimental design specific measures to test the effect of response bias. The present experiment was so designed.

STATEMENT OF HYPOTHESES

The specific hypotheses formulated to test for Subception and Perceptual Defense are as follows:

SUBCEPTION

Hypothesis I. All subjects will make significantly more discriminations of the conflict stimuli as compared to the neutral stimuli when such stimuli are presented below the level of awareness as measured by phenomenal report.

PERCEPTUAL DEFENSE

Hypothesis I. Subjects using avoidance as a "general defense" against psychosexual impulses will show perceptual avoidance when the conflict stimuli are presented at a stimulus magnitude permitting awareness, but below veridical threshold.

Hypothesis II. Subjects using projection as a "general defense" against psychosexual impulses will show perceptual vigilance when the conflict stimuli are presented at a stimulus magnitude permitting awareness, but below veridical threshold.

Hypothesis III. Subjects classified as "specific defenders" against psychosexual impulses will not show perceptual defense to the conflict stimuli when such stimuli are presented at a stimulus magnitude permitting awareness, but below veridical threshold.

METHOD

The experiment consisted of three phases: The Defense Assessment, the Subception, and the Perceptual Defense phase. The Defense Assessment phase was used to select Ss for the three experimental groups. The Subception phase tested for perceptual discriminations when stimuli were presented below levels of verbal awareness, and the Perceptual Defense phase was designed to test for both avoidance and vigilance defenses in perception.

The initial problem confronting E was the selection of an adequate instrument to assess Ss defensive behavior and the selection of perceptual stimuli that could be equated for ease of recognition based upon their structural characteristics. Several defense assessment instruments were considered and a pilot study was conducted to equate the perceptual stimuli.

SELECTION OF A DEFENSE MEASURE AND PERCEPTUAL STIMULI

Three different instruments were tested for their applicability in determining the methods of defense used by subjects to handle material related to aggression and sex. The first of these is a Phrase Association Test devised by Heath (1956), who presented a convincing argument for the use of more highly structured tests in the study of ego defenses. This test is similar to the word association tests but uses phrases instead of words and requires phrases or sentences as responses. The second instrument tested is a highly structured sentence completion test containing sexual and aggressive stems. These stems were taken from a larger test devised by Forer (1950). While broad category classifica-

tion was possible on the basis of these two instruments, considerable difficulty was encountered in attempting to classify subjects' responses into specific types of defenses. Consequently, a third measure was selected for use in the present experiment. This measure is the Defense Preference Inquiry (MPI) as revised by Blum (1956).

The Defense Preference Inquiry (DPI) provides an objective method of determining subjects' preferred ego defenses in dealing with various psychosexual conflicts in terms of five defense mechanisms as presented in psychoanalytic theory. The DPI is used in conjunction with the Blacky Pictures (1949). In the DPI, the subjects are asked to rank a series of five statements, each describing some feeling or behavior judged to represent a particular type of defense, in terms of how Blacky may be feeling or acting in a particular picture. The instructions are formulated to encourage subjects' identification with Blacky, thereby, revealing their own personal reactions. Spontaneity is further facilitated by very short time limits which preclude the possibility of deliberation in assigning the ranks. The serial positions of the five defenses are rotated in a systematic manner throughout the inquiry. The five alternative defenses are: avoidance (the generic term coined for the repression-denial family), regression, reaction formation, projection, and intellectualization.

An illustrative set of the DPI items relating to Oral Sadism are presented here. The complete set appear in Appendix B of this paper. The subject is first instructed to write a two minute story about the particular Blacky Picture. He is then asked to rank the corresponding

DPI items. For example:

Rank all of the following statements according to how well they seem to fit the situation.

- | | |
|----------------------|----------------------|
| 1 = fits best | 4 = fits fourth best |
| 2 = fits second best | 5 = fits worst |
| 3 = fits third best | |

- (Rg) A. When Blacky gets angry, he often throws a temper tantrum like he did in his earlier days.
- (RF) B. Blacky tries to pretend that he's ferocious, but when Mamma is around he is sure to be overly gentle, calm, and well-behaved.
- (Int) C. Blacky is a firm believer in the idea of releasing one's aggressions, so he feels justified in ripping Mamma's collar here.
- (Av) D. Blacky is so intent on chewing the collar to pieces that he doesn't even realize it belongs to Mamma.
- (P) E. In Blacky's own way of thinking, his family has been treating him so unfairly that he feels entitled to chew up the collar.

Each group of DPI items is related to a particular psycho-sexual dimension.

The issues of reliability and validity must be considered when using such a technique. The DPI has been used in an extensive research program at the University of Michigan (1956), and most of the reliability and validity data comes from this experimentation. Two test-retest measures resulted in product moment correlations of .45 and .46. Of the first choices on one administration, 73 per cent occurred as either first or second choices on the second administration. Last choices proved to be almost as stable as first choices.

Construct validity has been demonstrated in a number of studies. Blum (1954, 1955) and Nelson (1955) both found that avoidance prefer-

ences on the DPI were significantly associated with perceptual defense in a task involving the presentation of the Blacky Pictures. In the first fraternity study at the University of Michigan, avoidance preference was significantly associated with forgetting of pictures in a recall task; selection of neutral rather than conflict-relevant solutions in word completion and anagram experiments.

Significant differences between the "general" defender who tends to choose the same defense for all psychosexual dimensions and the more common "specific" defender who tends to choose different defenses for each psychosexual dimension have been reported. Shiro (1954) demonstrated that the general defender was significantly more maladjusted on two genotypic measures--the Munroe Inspection Technique for the Rorschach, and the spontaneous Stories on the Blacky Pictures. Segal (1954) divided female subjects into the general and specific defender categories. Both groups were equated for strength of hostile and dependent impulses on basis of their TAT and Blacky stories. Her results indicated that subjects in the general defender category were less able to express feelings of hostility or dependency towards their mothers in a personal interview situation than subjects in the specific defender category.

All of the validity studies just reviewed have dealt only with avoidance as a defense preference. As yet, little evidence has been reported for the validity of the other defense items. A study by Cohen (1956) using the DPI has indicated that individuals sharing a preference for projection as a defense show more negative inter-personal reactions than paired individuals preferring different defense mechanism.

The present study also served as a test of construct validity of the projection defense items.

Since the DPI was administered to what may be considered a normal college population, it is reasonable to assume that subjects will range from little or no conflict in relation to sexual or aggressive impulses to rather intense conflict in these areas. On the basis of previous research, subjects having little conflict should fall within the specific defender category. Subjects with more intense conflicts should fall within the general defense category. It was hypothesized that this latter group would be more likely to show defensive behavior in perception. Consequently, those subjects who were classified as general defenders and who preferred either avoidance or projection as a defense were selected for this experiment.

To place subjects in the two defense categories, eight Blacky Pictures and the corresponding DPI items were used. Three of the pictures were selected because they related to sexual behavior; four pictures because they were related to hostile impulses; and an eighth picture was chosen to complete the series. It was felt that eight pictures were sufficient to give an adequate sample of subjects defense preferences, as well as an adequate measure of defense consistency. The eight pictures chosen, represent the following psychosexual dimensions:

Oral Eroticism	I	Masturbation Guilt	V
Oral Sadism	II	Overt Aggression	VII
Anal Sadism	III	Sibling Rivalry	VIII
Oedipal Intensity	IV	Guilt Feelings	IX

The spontaneous stories to the eight pictures served to sensitize subjects to the various situations depicted. It was assumed that in

composing stories to the stimuli that the subjects's own conflicts and feelings would be aroused and would influence his defense rankings.

Perceptual stimuli. In selecting stimuli for the perceptual task, the variables of stimulus familiarity and physical similarity had to be considered. Familiarity was controlled by using stimuli with which subjects had had no previous experience. Matching the stimuli in terms of their physical properties for ease of recognition was a more difficult task. This was done by trial and error matching of the neutral and conflict stimuli and by altering some of the characteristics of the neutral stimulus.

Small black and white drawings of Blacky as depicted in the Blacky Pictures (Blum, 1949) were used as perceptual stimuli. There were several advantages in using this type of stimulus material. First, The Blacky Pictures have been used in previous perceptual studies, and avoidance behavior to such stimuli has been demonstrated. Second, such drawings are easily altered to permit matching for ease of recognition.

Pilot study. A pilot study was conducted to equate the perceptual stimuli for ease of recognition. To do this, a test group was needed in which the motivational variable was minimized. It had been shown by Shire (1954), and Segal (1954) that Ss classified as "specific defenders" on the Defense Preference Inquiry were less maladjusted than "general defenders". It was hypothesized that the specific defenders would show less defensive behavior, and that any differential response to the perceptual stimuli would be due mainly to the physical characteristics of the stimulus material. The Defense Preference Inquiry was administered

to the pilot group, and a random sample of "specific defenders" was selected for the perceptual experiment.

Six drawings of Blacky were selected as the perceptual stimuli. These drawings were arranged in three pairs. The first pair was labeled Sex-Neutral, the second pair, Aggression-Neutral, and the third pair, which consisted of two neutral drawings, was labeled the Acuity Test pair. The experimental design used to equate each member of a pair with the other is a four stimulus configuration. This design and procedure has been described in detail by Blum (1954). Four Blacky Pictures were flashed simultaneously in a tachistoscope. Two of the pictures were termed the critical stimuli, which were one of the above mentioned pairs. The other two pictures served as distractors. Ss were instructed to locate (top, bottom, right, or left) one of the critical pictures for a series of ten trials and then the other critical picture for a series of ten trials. The same procedure was repeated for each critical pair.

The exposure speed was varied until a setting was found at which Ss could locate one or both of the critical stimuli with approximately 75% accuracy. Errors in locating each critical stimulus were tabulated, and the neutral stimulus of each pair was changed or altered until no significant error difference between critical stimuli was found.

During the test series, Ss were questioned about any stimulus characteristics that seemed to help them in recognition. It was found that Ss reports were quite unreliable. They would describe certain characteristics as aiding recognition of a stimulus, when in fact, they

were making more errors in trying to locate that particular stimulus. Ss would also describe characteristics of a stimulus that actually did not exist. Consequently, a trial and error method was used in matching the stimuli. Although the general position of the figures had to be similar, the figures had to be distinctly different to permit discrimination. The three pairs of critical stimuli selected are presented in Appendix C of this paper.

A second sample of Ss taken from the "specific defender" category, as determined by the Defense Preference Inquiry, were used to determine and exposure setting at which an initial measure of visual acuity could be taken for use in the perceptual defense analysis. The Acuity Test stimuli which consisted of two neutral pictures of Blacky in a standing position were reproduced on cards, so that each member of a pair appeared once on the right and once on the left side of a card. A blank space of equal area was outlined on each card between the Acuity Test stimuli. Each member of the Acuity Test pair was also reproduced individually. When these individual stimuli were flashed, they appeared in the blank space between the Acuity Test stimuli. The Acuity Test pair remained constant in Ss' visual field, except that the right-left side positions were reversed on alternate trials. The individual stimuli were exposed in a random manner for a series of 20 trials, and Ss were asked to state which of the constant stimuli had been flashed on each trial.

The exposure time for the individual stimulus presentations was varied until a setting was found that enabled Ss to make approximately

50% correct discriminations of the Acuity Test stimuli. This exposure setting remained constant for all Ss in the Acuity Test series and Perceptual Defense series of the main experiment. The exposure setting selected was .15 seconds with illuminosity readings as follows:

Adapting field	.042	ft. lamberts
Adapting field plus Test field	.031	ft. lamberts

The second illuminosity reading represents the simultaneous exposure of both adapting and test fields. Illumination in the adapting field remained constant during the test field exposure.

A third sample of Ss taken from the "specific defender" group was used to test for adaptation to repeated exposures of the stimuli when these are presented at stimulus magnitudes below verbal awareness. Each stimulus comprising the Sex-Neutral and Aggression-Neutral pairs was first presented to S at a .10 second exposure. Exposure time was decreased .01 second decrements until S reported no longer seeing anything in the visual field. The shortest exposure time for the 4 stimuli was used as the exposure setting for the series. If thresholds tended to become lower with succeeding trials, then it was expected that Ss would show more accuracy in discrimination near the end of the series. Responses were divided into 5 blocks of trials with 4 trials in each block. Group error means were computed for each trial block. No systematic increase in response accuracy with succeeding blocks of trials was noted. Ss did not report seeing the stimuli during the 20 trial series.

On the basis of the pilot study, the perceptual stimuli to be used in the main experiment were equated for physical characteristics which might influence recognition thresholds, and an exposure time was established which remained constant for all Ss in the Perceptual Defense Phase of the main experiment. A test of the adequacy of phenomenal report as an indicator of below awareness thresholds was also conducted. Recognition thresholds did not vary with repeated presentations of the stimuli.

SUBJECTS

A group of 314 students from introductory classes in psychology took part in the defense assessment phase of the experiment. Ss were taken from both morning and afternoon classes, and from classes meeting on each day of the school week. From this larger pool, three experimental groups were selected on the basis of the type of defense used in dealing with a number of psychosexual conflicts. Using the Defense Preference Inquiry as a measure of defense, Ss were required to meet two criteria for placement into the experimental groups. The first criterion used was the number of first place rankings of a particular defense mechanism to the eight psychosexual dimensions. Ss who selected the same defense mechanism four or more times as their first choice were classified as "general" defenders. A second criterion measure was then applied to Ss in the "general" defender group who had selected avoidance and projection as the preferred defenses. The second criterion dealt with the overall consistency of rankings to the eight psychosexual

dimensions. To measure consistency among the eight sets of ranks for each S, the Coefficient of Concordance (Edwards, 1954) was used. The cut off point for inclusion in one of the two groups was a value of W that was significant at the .20 level.

Twenty-six Ss who met both selection criteria were placed in the Avoidance group. Three of these Ss indicated that they did not wish to participate in the perceptual phases of the experiment and were dropped. A fourth S would not make a differential response during the perceptual phases of the experiment, even when the exposure time was increased to a 2 sec. exposure. Situational anxiety was quite evident. Because of her refusal or inability to follow instructions, this S was not included. The final Avoidance group contained 22 Ss, 10 male and 12 female.

Twenty-one Ss were originally placed in the Projection group. Two Ss did not appear for the perceptual phases of the experiment, and one S stated that he did not wish to participate further in the experiment. The final Projection group was composed of 18 Ss, 11 male and 7 female.

The remainder of the Ss who took part in the Defense Assessment phase were classified as "specific" defenders. A random sample of 30 Ss from this group was selected for placement in the No Defense experimental group. This group was given the no defense label since it was hypothesized that the specific defenders", as determined by the DPI would not show defense in perception. Five Ss were excluded from the original selection, either because they did not appear or did not wish

to participate in the perceptual phases of the experiment. The final No Defense group consisted of 25 Ss, 11 male and 14 female. A total of 65 Ss completed all phases of the experiment. See Appendix A for the list of experimental Ss.

MATERIALS AND APPARATUS

To measure Ss preferred defense mechanisms, eight Blacky Pictures and the corresponding DPI items were used (See Appendix B). The DPI items were presented in booklet form, and blank pages were provided between each set of DPI items for recording the spontaneous stories to the Blacky Pictures. Black and white slides of the eight Blacky Pictures were projected upon a screen for group administration.

Six 1" by 2" black and white drawings of Blacky were used as perceptual stimuli (See Appendix C). The drawings were arranged in three pairs and reproduced so that each member of a particular pair appeared both on the right and on the left side of a card. The stimulus pairs were mounted upon light gray posterboard cards. The first pair of drawings were designated as neutral, and depicted Blacky in two different standing positions. This pair was labeled the Acuity Test stimuli. The second pair was labeled Sex-Neutral and consisted of a drawing of Blacky as pictured on Card V (Masturbation Guilt) of the Blacky Pictures and a picture of Blacky in a neutral, reclining position. The third pair was labeled Aggression-Neutral and consisted of a drawing of Blacky as depicted on card II (Oral Sadism) and a neutral picture of Blacky in a standing position.

A blank space of equal area was outlined between the two drawings comprising a stimulus pair. A fixation point was located in the center of each outlined space. The stimulus pairs were exposed to S from the adapting field of the tachistoscope and remained a constant stimulus for each trial.

The 6 drawings constituting the 3 stimulus pairs were reproduced individually on gray posterboard cards. These individual stimuli were exposed from the test field of the tachistoscope and appeared in the outlined space between the constant stimulus pairs. Because of the mirror arrangement in the tachistoscope, the constant stimulus pairs were reproduced in reverse position to the individual reproductions, so that upon exposure in the tachistoscope all pictures would appear in the same direction.

A Gerbrands tachistoscope was used in the perceptual phases of the experiment. A slight modification of the instrument was necessary to permit a constant power supply to the lamps in the adapting field. This was done by wiring around the micro-switch so that the contacts with the adapting field remained constant during the test field exposure. Illumination was reduced by the use of gray art paper filters and remained constant for all subjects. Illuminosity was measured by a Macbeth illuminometer¹, with readings as follows:

Adapting field	.042	ft. lamberts
Adapting plus test field	.031	ft. lamberts

¹Grateful acknowledgement is made to Dr. S. H. Bartley for taking the illuminosity measures.

The second reading represents the illuminosity conditions during the simultaneous exposure of both the adapting and test fields. Exposure settings for the tachistoscopic presentation of stimuli in the subception series were determined individually for each S. The exposure time of .15 sec., which was determined in the pilot study, was used for all Ss in the Perceptual Defense phase of the experiment.

THE MEASURES

The measures used in this investigation were termed "indicators" after Goldiamond (1958). The indicator used to determine below awareness thresholds for the subception phase was labeled a phenomenal report indicator. This indicator represents a judgment or opinion. Ss stated when they could no longer see anything flashed in the visual field.

The indicator used to test for subception and perceptual defense effects was termed a forced-choice accuracy indicator. Ss' responses were either correct or incorrect. In the present study, this indicator included both an accuracy and a category dimension.

Subception was measured in terms of the asynchrony between phenomenal report and the forced-choice accuracy indicator. Perceptual defense was measured in terms of inter-group and inter-category response accuracy.

PROCEDURE

DEFENSE ASSESSMENT

The method of administering the Blacky Pictures and the correspond-

ing DPI items was essentially that described by Blum (1956). Ss were seen in groups and the Blacky Pictures were projected on a screen. Ss wrote their spontaneous stories in the test booklets provided by E, and then ranked the DPI items. The following verbal instructions were given:

I am going to show you a series of pictures about a dog named Blacky. These are like the cartoons you see in the paper. I will present one picture at a time, and I want you to make up a short story about each one. Tell what is happening in the picture and why it is happening. Since this is a test of how good your imagination can be, try to write vividly about how the characters feel. You will have two minutes for each story. It is desirable to write as much as possible within the time limit. I will signal when there are only thirty seconds left to finish a story.

After the two minutes for the story are up, you will be asked to turn the page, where you will find a series of five statements describing some possible feelings or reactions of Blacky in the cartoon you just saw. I want you to rank these statements as to how well you think they represent the way Blacky seems to be feeling or acting in that situation. Naturally, there are no right or wrong answers involved. Just write a "1" alongside the statement that fits best, a "2" alongside the second best, a "3" for third best, a "4" for the one that fits fourth best, and a "5" for the one that fits worst. Regardless of how well or poorly the statements seem to fit, be sure to rank them all "1" through "5". Never leave a statement unranked. You will have 55 seconds for each set of rankings so you will have to work rapidly. I will indicate when there are only ten seconds left.

Remember then, for each picture you will have two tasks—first to write a two-minute, imaginative story about how Blacky is feeling or acting, and second, to rank order the five statements about the picture. Never turn a page until I give the signal and never look back at what is already done.

Ss' rankings for the eight sets of DPI items were recorded. On the basis of these rankings, Ss were classified as either "general" or "specific" defenders. Ss classified as general defenders who selected avoidance

and projection as the preferred defenses and who showed consistency in their rankings were placed into two experimental groups, designated as the Avoidance Defense and Projection Defense groups. A random sample was taken from the specific defender group and was designated as the No Defense experimental group. These Ss took part in the perceptual phases of the experiment.

SUBCEPTION PHASE

To test the subception hypothesis, it was necessary to determine an exposure level at which Ss could no longer report seeing anything in the visual field. This exposure time was termed the below awareness threshold exposure. A below threshold exposure was determined for each stimulus of the Sex-Neutral and Aggression-Neutral pairs. Each stimulus was first presented at a .10 sec. exposure and was decreased by .01 sec. decrements until S no longer reported seeing anything in the visual field. The order of presentation varied systematically for each S. The shortest exposure time recorded for the four stimuli was used as the exposure setting for the discrimination task in the subception series. Ss were seated at the tachistoscope and were given the following instructions:

Do you see the black dot in the center of the screen? When I say ready, focus on the black dot. I will then flash a picture. The picture will be flashed quite rapidly so you probably won't know what it was. This doesn't matter. I will continue flashing this picture but each time the exposure will be a little shorter. I want you to tell me when you no longer see anything flashed. Be sure that you don't see anything. I will always say ready right before I flash the picture.

The procedure was repeated for all four of the stimuli comprising the conflict-neutral pairs. Ss were then given a one minute rest period

before starting the subception task.

After the rest period, Ss were presented with the discrimination task. An A - B - x type of experimental design was utilized. The Sex-Neutral and Aggression-Neutral pairs were labeled either A or B. The stimulus pairs were presented on alternate trials and remained a constant stimulus for that trial. Then either A or B of the constant stimulus pair appearing on that particular trial was flashed in the blank space between the constant stimuli. S indicated which picture had been presented. The right-left side positions of each constant stimulus pair was also reversed on alternate trials. Forty trials were given so that each individual stimulus of the Conflict-Neutral pairs was presented 10 times. Two set random orders for presentation of the individual stimuli were used. The exposure time varied for each S. However, the range was quite small, varying from .01 sec. to .03 sec. with illumination remaining constant for all Ss. The following verbal instructions were given:

Do you see the two pictures labeled A and B? They are small drawings of the Blacky Pictures that I showed you in class. Picture A shows Blacky discovering sex. B is a picture of Blacky lying down. All right, now look at this pair. (E removed the Sex-Neutral pair and presented the Aggression-Neutral pair). A is a picture of Blacky in a standing position, and B shows Blacky chewing angrily on Mamma's collar. Now notice the outlined space between the pictures, with the small dot in the center. I am going to flash some pictures which will appear in that blank space. Each time, the picture flashed will be either A or B of the pair that you see. I want you to tell me which picture was flashed. Just call out A or B.

The two pairs of pictures I have just shown you will be presented on alternate trials, but in each case the picture flashed will be either A or B of the pair that you see on the screen for that trial. Also, the positions of the pictures making up a pair will be reversed on alternate trials, so

that if A appears on the right for one trial, it will appear on the left on the next trial.

The pictures will be flashed so rapidly that you won't be aware of anything happening on the screen, but each time take a guess as to whether it was A or B that was flashed. The pictures will not appear in any set order, and one may appear more often than the other, so do not make your next choice on the basis of the previous guess. It has been reported that people can still see things even when they are not aware of it, and I want to see if this is so. Each time then, take an independent guess as to which picture was flashed. When I say ready, focus on the small dot in the center of the outlined space. It will then flash the picture.

Although the instructions appear quite lengthy, the task was actually quite simple and Ss had no difficulty in comprehending what was expected of them.

The order of presentation of the constant stimulus pairs was varied among Ss. Half of the Ss were presented with the Sex-Neutral pair first and then alternately with the Aggression-Neutral pair for the series. The other half were presented with the Aggression-Neutral pair initially and then alternately with the Sex-Neutral pair. Ss were given 40 trials, with a thirty second rest period after each set of 10 trials, followed by a one minute rest period before continuing with the defense phase.

DEFENSE PHASE

In the defense phase, the stimulus magnitude was increased to a level permitting some awareness of the stimulus presentations, but below the threshold for veridical identification. A measure of individual visual acuity was first taken, using the Acuity Test stimuli. The exposure time used in this phase of the experiment was .15 sec. This exposure time was determined by the pilot study and represents a level at which approx-

imately 50% correct discriminations of the Acuity Test stimuli had been made. Ss were again required to make an A - B - x type discrimination. The two acuity test stimuli were labeled A and B and remained constant in Ss' visual field. Either A or B was then flashed individually in the outlined space between the constant stimuli. The right-left side positions were reversed on alternate trials for each constant stimulus. Ss were given 20 trials with a 30 sec. rest period after the first ten trials. The verbal instructions were similar to those used in the subception discrimination task.

Now we are going to do about the same thing we just finished, using these pictures. (E presented the Acuity Test stimulus pair). Only this time the pictures will be flashed much slower. Again, I will flash either A or B that you now see. You tell me if it was picture A or B that was flashed. When I say ready, focus on the small dot in the center of the outlined space. I will then flash the picture. If you are uncertain as to which picture was flashed, always take a guess.

Individual differences in subjective experience became apparent on this task. Some Ss stated that they had to guess on most of the trials. Others felt that they were able to make discriminations based upon stimulus characteristics after a few trials. After the one minute rest period, Ss were administered the defense series.

The Sex-Neutral and Aggression-Neutral stimulus pairs were again used as constant stimuli in the defense series. The exposure setting for the individual stimulus presentation was again .15 sec. with illumination also remaining constant for all Ss. The same A - B - x type of discrimination task was used, and Ss were given a series of 40 trials. A thirty second rest period was provided after each set of ten trials. Ss received the following instructions:

Now lets try the same thing again with the pictures that you have already seen. (E presented the Sex-Neutral and then the Aggression-Neutral pairs). Again, you are to tell me if it was picture A or B that was flashed. Remember to focus on the black dot in the center of the outlined space when I say ready. I will then flash the picture.

The Sex-Neutral and Aggression-Neutral constant stimuli were presented alternately for the 40 trial perceptual defense series, and the right left side positions of each member of the constant stimulus pairs were reversed on alternate trials.

Table 1 presents a summary of the general operating procedure. Ss were first selected for defense preference and placement into the experimental groups. Four measures were then taken for each S. First, a measure of stimulus magnitude was taken for the below awareness exposure. Second, Ss' responses on the subception series were recorded. The third measure was Ss' responses to the Acuity Test stimuli, and fourth, Ss' responses to the Perceptual Defense series were recorded. The last three measures were used in the statistical treatment of the results.

TABLE 1
SUMMARY OF OPERATIONAL DESIGN

Phase	Operations
Defense Assessment	Administration of DPI, and selection of Ss based on two criteria. 1. 4 or more 1st place rankings of Avoidance or Projection as preferred defense. 2. Total rank consistency as measured by Coefficient of Concordance.
Subception	1. Determination of awareness thresholds for the 4 stimuli constituting the Sex-neutral and Aggression-neutral pairs. 2. 40 trial discrimination task.
Perceptual defense	1. 20 trial visual acuity test series using neutral stimuli. 2. 40 trial defense series using Sex-neutral and Aggression-neutral stimulus pairs.

RESULTS

SUBCEPTION PHASE

It was hypothesized that if the subception principle were to operate, it would manifest itself in a greater response accuracy by all groups to the conflict stimulus category as compared to the neutral stimulus category. To test for the subception effect, the number of response errors to each stimulus category was tabulated for all Ss (See Appendix D).

Group error means for each stimulus category were computed, and the group mean error differences between stimulus categories were tested for significance. One tailed t tests for repeated measures on the same Ss (Edwards, 1950) were used to test for significance of the category mean error differences. F tests for homogeneity of variance between categories were not significant. The obtained mean error differences were tested against an hypothesized mean error difference of zero. Table 2 presents a summary of the statistical analysis. None of the obtained t values proved significant. The mean error difference in the Avoidance group was in the unexpected direction and was treated as equivalent to the absence of difference from 0. There was no evidence to support the hypothesis of a differential response accuracy in favor of the conflict stimulus category.

Since the conflict category was composed of both a Sex and an Aggression related stimulus, it was possible for Ss to have made a differential intra-category response, an occurrence which might not have been reflected in the inter-category comparison. To test for such an event, the number of errors to each stimulus of the conflict category was tabu-

TABLE 2
 ERROR MEANS AND MEAN ERROR DIFFERENCES BETWEEN
 STIMULUS CATEGORIES FOR ALL GROUPS
 IN THE SUBCEPTION SERIES*

Group	$\bar{M}$ errors Neutral	$\bar{M}$ errors Conflict	M diff.	t**	p
Av.	9.36	9.72	-.36	..	..
Proj.	9.67	9.56	.11	0.14	ns
No Def.	10.24	9.32	.92	1.46	ns

* Mean differences tested against an hypothesized mean difference of 0.

** One tailed t test for repeated measures on same Ss.

lated for all Ss (See Appendix E).

The group error means for each stimulus of the conflict category were computed, and the mean error difference between stimuli was tested for significance in all groups. F tests for homogeneity of variance between stimuli were not significant. Consequently, two tailed t tests for repeated measures on the same Ss were used to test for significance of the mean error difference between stimuli. The obtained mean differences were again tested against an hypothesized mean difference of 0. Table 3 presents a summary of these comparisons. None of the mean error differences between stimuli in the conflict category proved significant.

The possibility also existed that Ss might have had a significant total response accuracy to the subception series even though intra- and inter-category differences were non-significant. The total number of correct responses to the subception series was tabulated for all Ss (See Appendix F). If Ss were merely guessing in this forced-choice situation, the probability of a correct response on each trial would be .5, and the expected mean number of correct responses for each group would be 20. The obtained correct response means were tested against the expected mean of 20. Table 4 shows the total correct response means for all groups and significance of the difference between the obtained and expected correct response means. One tailed t tests were used in the analysis. Again, none of the mean difference comparisons proved significant.

The results of the subception analyses clearly failed to support the subception hypothesis. However, the question may be raised as to

TABLE 3
 ERROR LEANS AND LEAN ERROR DIFFERENCES IN RESPONSE
 TO THE SEX AND AGGRESSION STIMULI IN THE SUBCEPTION
 SERIES

Group	M Sex	M Agg.	M Diff.	t*	p
Avoid.	4.50	5.23	- .73	1.33	ns
Proj.	4.67	4.94	- .27	0.57	ns
No Def.	5.28	4.96	.32	0.63	ns

* Two tailed t tests for repeated measures on same Ss.

TABLE 4
TOTAL CORRECT RESPONSE MEANS
FOR THE THREE GROUPS ON THE SUBCEPTION SERIES*

Group	Mean	SD	t**	df	p
Av.	20.91	2.99	1.43	21	ns
Proj.	20.78	3.06	1.08	17	ns
No Def.	20.44	3.58	0.61	24	ns

* Obtained means tested against any hypothesized mean of 20.

** One tailed t tests.

whether repeated presentations of the conflict stimuli might not result in an adaptation or satiation effect, so that Ss would no longer show an increased sensitivity to the conflict stimuli. Failure to find significant results could be attributed to such a variable. The significant differential category response obtained in the Perceptual Defense series argues against the presence of an adaptation effect. The same stimuli were used in the Perceptual Defense series, the only difference being an increase in stimulus magnitude. If adaptation or satiation were present, a differential response would not have occurred in this series. It was concluded that when a verbal accuracy indicator is used as the measure of subception, and when the stimuli are presented at magnitudes below the level of verbal awareness as measured by phenomenological report, there is no evidence to indicate that Ss are able to make a perceptual discrimination.

PERCEPTUAL DEFENSE PHASE

The experimental design used in this phase of the investigation permitted both an inter-group and an inter-stimulus category analysis in testing for perceptual defense. In the inter-group comparison, an Analysis of Covariance was first employed to test for overall differences in discrimination among the three groups. The initial measure used in this analysis was the number of correct responses for each group on the 20 trial Acuity Test series, and the final measure was the number of correct responses on the 40 trial Perceptual Defense series (See Appendix G & H). Bartlett's test for homogeneity of variance was applied to both the Acuity and Defense measures. The resulting Chi-squares were not significant.

Table 5 presents a summary of the Analysis of Covariance. The obtained F value of 15.67 was significant beyond the .01 point for 2 and 61 df. Differences in discrimination among the three groups cannot be accounted for by initial differences in visual acuity since an adjustment is made for any such initial differences. In computing the Analysis of Covariance, it was found that the groups actually did not differ significantly on initial level of visual acuity.

Since overall differences in discrimination proved to be significant, between group comparisons were performed to determine more precisely the source of difference among the three groups. The measure used in this analysis was a mean difference score which was derived by subtracting Ss' correct responses on the Acuity Test series from the number of correct responses on the Perceptual Defense series (see Appendix I). From the Perceptual Defense hypotheses it was predicted that the Avoidance group would make significantly fewer correct responses than the No Defense group, and that the Projection group would make significantly more correct responses than the No Defense group.

Table 6 shows the mean difference comparisons of the Avoidance and Projection groups with the No Defense group. An F test for homogeneity of variance was not significant for either the Avoidance-No Defense or the Projection-No Defense comparisons. Consequently, one tailed t tests were used to test for the significance of the difference between means. The obtained t value of 4.25 for the Projection-No Defense comparison was significant beyond the .01 point for 41 df. The t value of 0.66 obtained for the Avoidance-No Defense comparison was not significant at

TABLE 5
ANALYSIS OF COVARIANCE OF CORRECT RESPONSES FOR THE
THREE GROUPS IN THE PERCEPTUAL DEFENSE SERIES

	Total	Within	Between
1. Sum of products	375.42	351.62	23.80
2. Sum of squares X (Acuity Test)	410.25	405.63	4.62
3. Sum of squares Y (Defense series)	1573.14	1117.24	455.90
4. df	64	62	2
5. Correlation	.467	.522	.519
5a. df for r	63	61	1
6. b _{yx} value	.9151	.8668	
7. Adjusted Σy^2	1229.80	812.45	417.35
8. df	63	61	2
F = 15.67*			

* $p < .01$

TABLE 6
COMPARISON OF AVOIDANCE AND PROJECTION GROUP MEAN
ACCURACY SCORES ON THE PERCEPTUAL DEFENSE SERIES
WITH THE NO DEFENSE GROUP

Group	Mean	SD	t*	p
Avoid.	11.86	2.90	0.66	ns
No Def.	<u>12.32</u>	4.53		
Mean Diff.	.46			
Proj.	17.73	6.36	4.25	< .01
No Def.	<u>12.32</u>	4.53		
Mean Diff.	5.41			

* One tailed t tests

the .05 point for 45 df. The results indicated that the overall differences in discrimination as found in the Analysis of Covariance could be attributed only to differences found in the Projection group. There were no significant differences between the Avoidance and No Defense groups.

Since it was found that the three groups actually did not differ significantly on initial level of visual acuity, an inter-group comparison of responses to the neutral stimulus category was then conducted. An Analysis of Variance was employed, using the total error scores to the neutral stimulus category as a measure of discrimination. (See Appendix J). Table 7 presents a summary of this analysis. The obtained F value of 2.64 was not significant at the .05 point for 2 and 62 df. There were no significant differences among the three groups in response to the neutral stimulus category. From this analysis, it was concluded that the Projection group differed significantly from the other groups only in response to the conflict stimulus category.

There are two possible conditions which could have resulted in the failure to find significant differences between the Avoidance and No Defense groups. First, the possibility exists that the Avoidance group did not show avoidant behavior in perception, in which case, the first Perceptual Defense hypothesis would not be supported. A second possible condition is that both the Avoidance and No Defense groups might have shown avoidant behavior in perception, in which case, the third Perceptual Defense hypothesis would not have been supported. To determine which condition existed, a stimulus category analysis was conducted.

For the stimulus category analysis, total response errors to the

TABLE 7
ANALYSIS OF VARIANCE OF ERROR SCORES TO THE NEUTRAL
STIMULUS PRESENTATIONS IN THE DEFENSE SERIES

Source of variation	Sums of squares	df	Mean square	F
Between groups	35.81	2	17.90	2.64*
Within groups	<u>420.41</u>	<u>62</u>	6.78	
Total	456.22	64		

* Not significant ($p > .05$).

conflict and neutral categories for the 40 trial Perceptual Defense series were tabulated for all Ss (See Appendix J). From the Perceptual Defense hypotheses it was predicted that the group using avoidance as a general defense would make significantly more errors in response to the conflict related stimuli than to the neutral stimuli, and that the group using projection as a general defense would make significantly fewer errors to the conflict stimuli than to the neutral stimuli. Finally, the no defense group would show no significant error difference in response to the stimulus categories.

Table 8 shows the group error means to each stimulus category and the significance of the mean error differences between categories for each group. One tailed t tests for repeated measures on the same Ss were used to test for significance of the mean category error differences. F tests for homogeneity of variance between categories were not significant. All of the obtained mean error differences were tested against an hypothesized mean difference of 0. The t value of 2.88 for the Avoidance group was significant beyond the .01 point for 21 df. and the t value of 1.86 for the Projection group was significant at the .05 point for 17 df. The t value of 1.73 for the No Defense group was not significant at the .05 level for 24 df. These results supported all three of the Perceptual Defense hypotheses.

The questioned still remained as to why the Avoidance and No Defense groups failed to show significant inter-group differences in response to the conflict category. A further examination of the inter-category analysis for the No Defense group revealed that although the t value of

TABLE 8
 ERROR MEANS AND THE LEAN ERROR DIFFERENCE SCORES TO
 THE NEUTRAL AND CONFLICT STIMULI FOR THE THREE
 GROUPS IN THE PERCEPTUAL DEFENSE SERIES

Group	M Neut.	M Conf.	M Diff.	t	p
Avoid.	6.95	9.04	- 2.09	2.88	$< .01^*$
Proj.	5.39	4.22	1.17	1.66	$< .05^*$
No Def.	6.92	8.04	- 1.12	1.73	$> .05^{**}$

* One tailed t tests for repeated measures on same Ss.

** Two tailed t test for repeated measures on same Ss.

1.73 was not significant at the .05 level, it did reach significance at the .10 level. This indicated a tendency for the No Defense group to make more errors in response to the conflict stimuli--a response similar to the Avoidance group. Because of this tendency, inter-group differences proved non-significant.

A further analysis was conducted to determine whether a differential response to the Sex and Aggression stimuli comprising the conflict stimulus category existed (See Appendix K). This analysis provides a test of the construct validity of the Defense Preference Inquiry which was used to classify Ss. The construct tested is that the so called "general defender" will use the same defense in dealing with all areas of conflict. This would be substantiated by a lack of significant differences in response to the two conflict stimuli used in this study.

Table 9 shows the group error means to each stimulus of the conflict category and the significance of the mean error difference in each group. Two tailed t tests for repeated measures on the same Ss were used in the analysis. The obtained mean error difference scores were tested against an hypothesized mean error difference of 0. None of the resulting t values proved significant. The groups showed no differential response based on stimulus type.

Some additional analyses were performed to insure that the results could not be attributed to extraneous sources of variance which might have influenced the verbal accuracy indicator independent of the perceptual variables. It has been reported in previous research (Howes & Solomon, 1951; Freeman, 1954) that Ss show an adaptation effect to

TABLE 9
 ERROR MEANS AND THE MEAN ERROR DIFFERENCES IN RESPONSE
 TO THE SEX AND AGGRESSION STIMULI IN THE PERCEPTUAL
 DEFENSE SERIES

Group	M Sex	M Agg.	M Diff.	t*	p
Avoid.	4.45	4.59	- .14	0.27	ns
Proj.	1.78	2.44	- .66	1.66	ns
No Def.	3.80	4.24	- .44	1.07	ns

* Two tailed t tests for repeated measures on same Ss.

threatening stimuli. Thresholds for such stimuli become lower with succeeding presentations. If adaptation occurred in the present study, Ss should have shown a consistent error decrement on succeeding trials in the Perceptual Defense Series. To test for such an effect, the 40 trial series was divided into 10 trial blocks with 4 trials in each block. Error means for each trial block were computed for all groups.

Figure 1 shows the performance curves for the three groups constructed from the error means for each trial block. All groups show a sharp error decrement from the first to the second trial block. This is most likely a function of continued adaptation to the lower illumination in the tachistoscope. There is no apparent systematic trend in error performance following the initial decrement in all groups. Of particular interest is the much lower error mean for the Projection group on the initial trial block, especially since the three groups did not differ significantly in visual acuity. The Projection group shows an immediate vigilance response, which it maintains throughout the defense series. This initial error difference cannot be accounted for in terms of adaptation to repeated stimulus presentations.

A second variable which could have led to differential response accuracy independent of perception is that of response bias. Ss might have shown a response disposition for one or the other of the stimulus categories, especially since both a neutral and conflict stimulus remained constant in Ss' visual field on each trial. It might be argued, for example, that the Avoidance group could have avoided calling the conflict category, and consequently, would have made fewer errors to

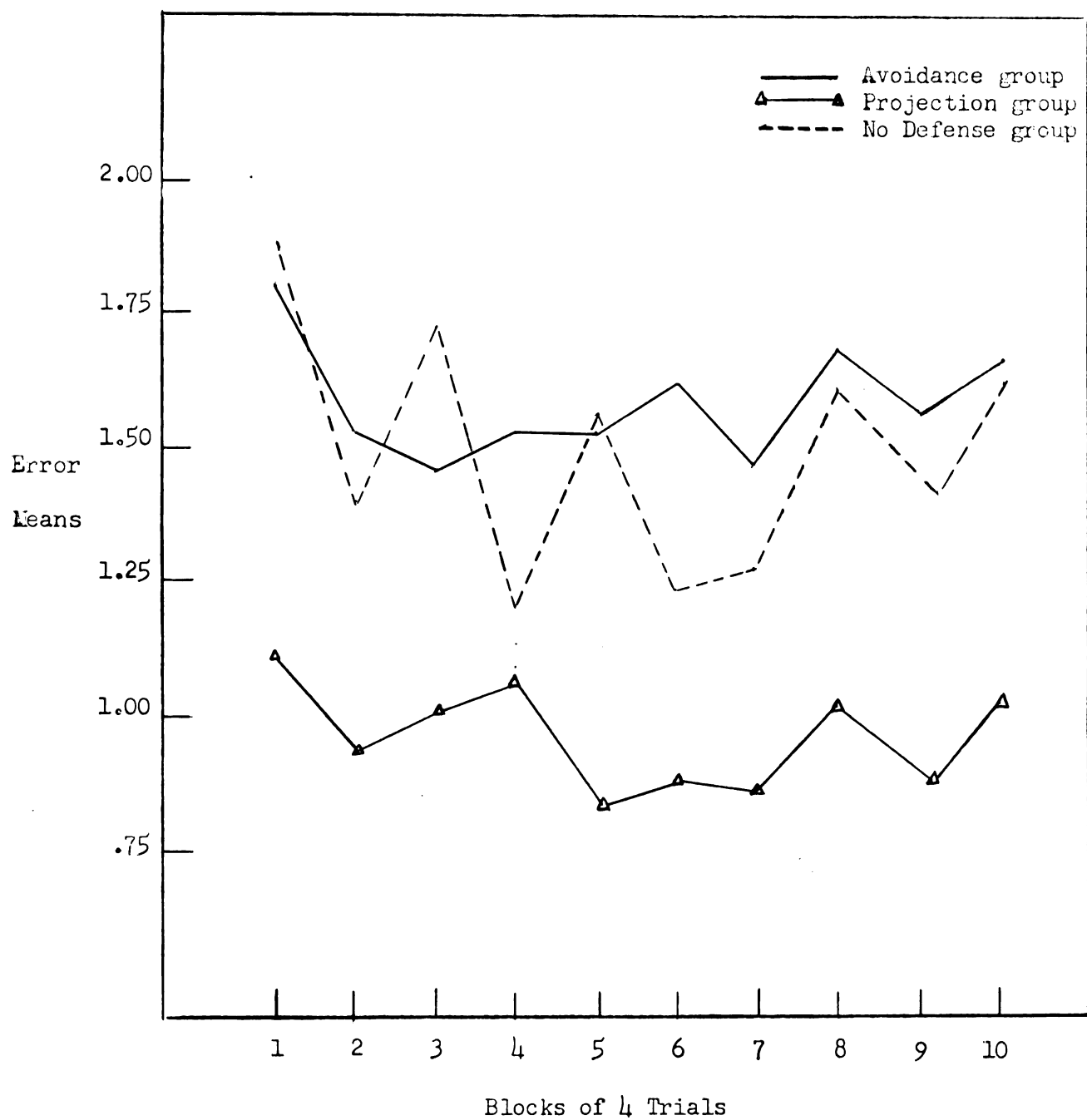


Figure 1. GROUP ERROR MEANS FOR SUCCESSIVE TRIAL BLOCKS IN THE PERCEPTUAL DEFENSE SERIES

the neutral stimulus presentations. A response disposition in the Projection group might have led to overcalls of the conflict stimuli resulting in more errors to the neutral stimulus presentations. Response bias would have resulted then in a differential response between groups to the neutral category. Table 7 shows the Analysis of Variance of responses to the neutral category for the three groups. The obtained F value of 2.64 was not significant. The results indicate that the differential inter-category response is not a function of response dispositions operating independently of the discriminative stimuli.

A final analysis was conducted to determine whether differences in discrimination might be related to sex of S. Correct responses were tabulated for the two sexes in all groups (See Appendix L). Male and Female response means were computed for all groups and the mean differences were tested against an hypothesized mean difference of 0. Table 10 presents a summary of the analysis. Two tailed t tests were used in making the mean difference comparisons. None of the obtained t values proved significant. There was no evidence to indicate that sex of S was related to differential accuracy in perceptual discrimination.

The results of the additional analyses failed to provide any evidence to support the view that differential response in the perception task can best be explained as a function of extraneous variables independent of actual perceptual processes. The differences in response would appear, therefore, to involve perceptual discrimination, indicating a relationship between personality variables and perceptual processes.

TABLE 10
SIGNIFICANCE OF CORRECT RESPONSE MEAN DIFFERENCES
BETWEEN MALE AND FEMALE SUBJECTS IN ALL GROUPS
IN THE PERCEPTUAL DEFENSE SERIES

Group	M Male	M Fem.	M Diff.	t*	p
Avoid	24.50	23.58	.92	0.68	ns
Proj.	31.09	29.28	1.81	0.81	ns
No Def.	23.91	25.92	- 2.01	1.03	ns

* Two tailed t test.

DISCUSSION

SUBCEPTION PHASE

The results of the subception phase indicated that Ss were unable to make a perceptual discrimination as measured by a verbal accuracy indicator when the discriminative stimuli were presented below the level of awareness. The stimulus magnitudes representing "below awareness" were those exposure speeds at which Ss could no longer report seeing anything in the visual field. It is believed, therefore, that the results represent contradictory evidence to this one aspect of the findings reported by Dixon (1958). Since the present study is not a replication of Dixon's experiment, the existence of a true contradiction assumes, of course, the comparability of the indices of perception as well as the nature and relevance of the perceptual stimuli used.

In Dixon's study, taboo words were used as the threatening stimuli. An implicit assumption in using this type of stimulus material is that such words will be threatening to all Ss, and that they will react to such threat in the same manner. Previous research in perceptual defense has shown this to be a rather gratuitous assumption. There are differences in the degree of threat, and not all Ss deal with threat in the same way.

In the present study, Ss particular response to threatening stimuli was first determined. Two criteria were used to select those Ss most threatened by the stimuli used and who would show a significant consistency in their method of dealing with this threat. Consequently,

the stimuli used in the present investigation were considered to be even more relevant and uniformly threatening to Ss than those used in the Dixon study.

In both the Dixon study and the present investigation, the subception effect was measured in terms of a discrepancy between a phenomenological indicator and a forced-choice verbal accuracy indicator of perception. That is, S reports seeing nothing in the visual field and then makes a verbal discriminatory response. Although phenomenal report has been subjected to criticism as an indicator of perception, because it readily admits response variance extraneous to perception, such criticism would not seem as pertinent to either Dixon's or the present study since neither employed this indicator as a forced-choice measure. S did not have to make a judgment until he felt absolutely sure of it. In the present investigation, S was encouraged to see, rather than not see the stimulus presentation.

Although both experiments employed a verbal accuracy indicator, there was a marked difference in the application of such a measure. In the present study, S was required to make an immediate discriminatory response in a two-choice situation. In Dixon's experiment, a time interval of considerable length occurred between the stimulus presentation and the actual verbal accuracy measure. The effect of this time interval upon subsequent response is certainly open to question. In a recent experiment, Goldstein and Barthol (1960) reported that the presentation of a subliminal stimulus has an immediate effect upon subsequent responses but no sustained effect over a time

interval. In any event, one would expect the responses to be more accurate in the immediate and original stimulus situation. The effect, if any, of the stimulus presentations should have been more pronounced in the present experiment.

Dixon's results had dealt a blow at the current affective-veridical theory of perception. According to this theory, the affective response in subception is occasioned by partial information afforded by the discriminative stimulus. If the affective response is positive it facilitates veridical response, with perceptual sensitization as the result. If negative, the affective response tends to disrupt higher levels of integration, producing perceptual defense. Dixon's results did not support the view of affective-veridical threshold differences or the disrupting effect of the affective response, but rather, they indicated that both affective and veridical processes may be activated at stimulus magnitudes below phenomenal report. The results of the present investigation failed to support Dixon's findings and, therefore, raise some question concerning the function of veridical processes at such low stimulus magnitudes.

Although it was not a point of emphasis in their experiments, Blum (1954) and Nelson (1955) have also shown that veridical thresholds may be quite low. Using stimulus magnitudes described as "a low level of awareness below recognition thresholds", they demonstrated the subception phenomenon as measured by a verbal response indicator. At these stimulus magnitudes, S was aware of something being presented in the visual field to the point of being able to specify the general

class of stimulus material, but could not identify it. When the stimulus magnitudes were increased to a point described as "a high level of awareness below recognition thresholds", avoidant behavior occurred as measured by a verbal accuracy indicator. These latter stimulus magnitudes permitted a more specific identification of the stimulus but did not afford total recognition.

Besides indicating low thresholds for veridical processes, the results reported by Blum and Nelson suggest that at low stimulus magnitudes the veridical process may not be disrupted by an affective response. These results along with the work on perceptual sensitization raise some interesting questions concerning the affective response system. First, the question may be raised as to whether there is a direct relationship between stimulus magnitude and the strength of the affective response as measured by an autonomic indicator. Second, how do the affective responses to positive and negative stimuli differ, and can this difference be measured by an autonomic indicator? Third, does the disruption of higher integrative processes which is attributed to the negative affective response occur only when the affective response reaches a certain magnitude? These questions suggest directions for further research.

Eriksen et al. (1959) also opposed the view that affective responses occur temporally prior to, and are more accurate than, veridical response. They suggested that affective and veridical processes represent concurrent response systems, neither of which is more accurate than the other. Their results indicated that thresholds for the affect-

tive response may even be higher than veridical response thresholds.

Although the above results have created some interesting problems, they do not render untenable a theory of subception as a so called "unconscious" process. By "unconscious" it is meant that S is unable to verbalize an awareness of the stimulus being presented in the visual field. It may be that stimuli presented at magnitudes below phenomenal report can elicit an autonomic response. Dixon's results, using an autonomic indicator of perception, support such a view. Previous experiments which have employed the GSR as a measure of subception have not tested this hypothesis, since stimulus magnitudes were used which permitted a partial awareness of the stimuli. Much of the contradictory data can be related to differences in meaning of awareness thresholds and to differences in response indicators used to measure perception. Awareness thresholds must be more precisely defined, and the validity of the various measures used to indicate perceptual response must be examined. In relation to this latter point, it may be asked whether verbal judgments, forced-choice verbal accuracy measures, and total verbal identification are all manifestations of higher level or veridical processes. Future research will require greater recognition and integration of the available data as well as an increased emphasis upon psychophysical methodology if we are to show systematic progress in theory and understanding.

PERCEPTUAL DEFENSE PHASE

The results of the inter-category analysis in this phase of the

investigation support an extension of the concept of perceptual defense to include both avoidant and vigilant behavior. This concept of perceptual defense differs from that previously espoused by Blum (1954) who considered avoidance and vigilance to be two opposing processes in perception. According to Blum's view, vigilance occurs when conflict-related stimuli are presented at magnitudes below awareness. When the stimuli are presented at magnitudes approaching conscious recognition, a second process occurs by which Ss may delay or avoid recognition of the conflict stimuli. This latter process is termed perceptual defense. Similar formulations within a behavioral framework also have been presented. Stated briefly, the view expressed is that the conflict-related stimuli elicit an anxiety response which in turn serves as discriminative stimulus for the emission of previously conditioned avoidant behavior.

The thesis receiving support in this present study is that when threatening stimuli are presented at stimulus magnitudes approaching conscious recognition, a differential response occurs. The response may be either avoidance or vigilance and is a function of previous conditioning to threatening stimuli. This view is supported by both psychoanalytic theory which recognizes defenses other than repression in dealing with threat, and by behavioral theory. In learning terms, it may be stated that an anxiety response could serve as a discriminative stimulus for emitting either a conditioned avoidant or vigilant response.

In most experiments on perceptual defense, the method of dealing with threat is assumed to have been acquired in the past life of the

individual. The problem then becomes one of making inferences about this past experience and of predicting perceptual behavior in terms of these inferences. The general assumption has been that Ss will avoid threatening stimuli in perception. Often, the opposite or vigilant behavior was found. Further attempts to predict perceptual behavior from the degree of threat or level of anxiety have also led to inconsistent results. The results of the present study indicate that an approach to prediction in terms of Ss' inferred defense mechanisms is a fruitful one and also suggest that not only the degree of threat but a knowledge of the particular method of dealing with threat is necessary for predicting perceptual behavior.

The present findings are in agreement with those reported by Carpenter et al. (1956) who first treated avoidant and vigilant behavior within a framework of perceptual defense. In the present study, a third group, the No Defense group, was included to permit a more definite inference that vigilant behavior was actually serving as a defense. When only avoidant and non-avoidant groups are compared, differences in response to threatening stimuli are to be expected. It is difficult to infer that because recognitions thresholds for the non-avoidant group are lower, this greater sensitivity is a defense. It must be demonstrated that a group showing vigilance as a defense differs from a No Defense group. The inter-category and inter-group analyses in this phase of the investigation supported such an inference.

The failure to find significant inter-group differences between the Avoidance and No Defense groups was unexpected and demands explanation.

tion. One explanation may be made in terms of the classification criteria. The Defense Preference Inquiry (DPI), as with most instruments used in classification is undoubtedly far from being 100% efficient. The criteria used for placement into the "general" defender category may have failed to include a significant number of Ss which belonged in that category. An examination of the individual difference scores in the No Defense group based upon response to the Acuity and Perceptual Defense series revealed that 8 Ss had as low or lower scores than the lowest score cluster found in the Avoidance group. These Ss certainly appeared to be responding to the perceptual task in a manner similar to the Avoidance group. The need for further examination of the selection criteria is indicated.

In his original presentation of the DPI, Goldstein (1952) discovered a relationship between choices of avoidance and reaction formation for the "general" defender category. Ss who selected these defenses tended to give them first or second choice rank on all the psychosexual dimensions presented. The rankings for the 8 low Ss in the No Defense group were examined for such a relationship. Although no S selected either defense 4 or more times as the first choice, it was found that most first and second choices were distributed between these two defenses. Extending the selection criteria to include such an affinity of preference might increase the efficiency of the DPI.

A second explanation for the non-significant differences between the Avoidance and No Defense groups is possible. It may be that Ss who show little consistency in their rankings on the DPI, and who may

actually experience little conflict on the psychosocial dimensions presented, nevertheless, tend to show avoidant behavior in perception. If such a tendency exists, it stands in contradiction to the findings presented by Chodorkoff (1956) who found that the better adjusted Ss tend to show vigilance in perception. In any event, the results obtained call for further investigation of the so called "specific" defender group.

A major criticism of the experiments dealing with subception and perceptual defense is that the substantive contributions of such studies can generally be explained as a function of such variables as frequency of prior exposure to the stimuli, response suppression, bias, set, or learning. It becomes necessary, therefore, for E to control these sources of variance, or in those conditions in which control is not possible, to be able to test for the effects of extraneous variance. The present experiment provided such controls. Factors such as visual acuity, adaptation, response bias, and sex of S did not affect the results. The perceptual response obtained would certainly appear to involve a motivational variable.

Goldiamond (1958) in a recent critique of methodology in studies on perceptual defense discusses the perceptual response as operant behavior. By an operant, he means that the response is not elicited by the discriminative stimulus but will be emitted by the discriminative stimulus if there has been previous reinforcement in conjunction with the stimulus presentations. Consequently, the response can co-vary with all the variables that affect operant behavior. Goldiamond emphasizes

the point that such variables are typically not perceptual ones. To extend his point, it may be added that a reinforcing stimulus is not only operating in relation to an immediately prior response, but also is serving as a discriminative stimulus for a subsequent response. When the stimuli presented by E are of too low a magnitude to serve as discriminative stimuli, a particular response pattern may be occasioned by irrelevant stimuli such as expectancy, utility, or partial recognition of the discriminative stimulus. The response pattern then may be sustained independently of the actual stimuli provided by E. Analysis of the data did not support the presence of this form of response bias in the present study.

The position that Goldiamond seems to have taken is that perception is sensorily determined and is not affected by learning or other variables that modify response. Under such a view, defenses, needs, and affect would play no role in perception. Such a position has been attacked by Hebb (1952) who has attempted to show that perception of even simple objects such as a triangle is, in part, a learning process. Bruner and Minturn (1955) have demonstrated that the perceptual organization of the field is not a pure stimulus process but operates differentially with respect to identification given to the stimulus. A distinction between perception per se and its response indicator, while often proposed, may be theoretically untenable.

If perception can be considered to involve response, then it is subject to modification by variables such as learning. Many of the principles that underly learning in general should also apply to per-

ception. Previous research has been little concerned with such principles since learning was assumed to have occurred in the past. The controversial nature of this research has pointed up the need for more specific knowledge of the individual's past experience in order to avoid ad hoc explanations and to permit prediction. A study of Ss' defense mechanisms in dealing with threat provides one effective means of inferring past experience and for making predictions. However, it is not only important to know that defensive behavior and other personality variables affect perception, but also to increase our understanding of the ways in which perceptual learning is modified.

A direction for future research would be to investigate perceptual learning in the experimental setting. In this manner, we may be able to determine more directly the conditions under which reinforcement can alter perceptions; what effects past experience and motivational factors have upon new learning, as well as the role of autonomic and proprioceptive stimulation upon perception. Such a direction would appear necessary, if we are to increase our knowledge of how we perceive accurately or inaccurately.

SUMMARY AND CONCLUSIONS

The two major objectives in the present investigation were: (a) to test for the subception phenomenon using a verbal accuracy indicator at stimulus magnitudes too low to permit a phenomenal report of awareness, (b) to extend the concept of perceptual defense to include both avoidance and vigilance in perception.

The experiment was divided into three phases, the defense assessment, subception, and perceptual defense phase. In the defense assessment phase, 314 Ss were administered the Defense Preference Inquiry, a ranking task used in conjunction with the Blacky Pictures from which S's defenses on a number of psychosexual dimensions may be inferred. Two criteria were used to select Ss for the experimental groups. These criteria were: (1) 4 or more first place ranks of the same defense mechanisms, (2) total rank consistency. On the basis of the selection criteria, 22 Ss were placed in an Avoidance group, and 18 Ss were placed in a Projection group. A random sample of 25 Ss was chosen from the group showing little defense consistency and were placed in a No Defense group. The three groups then took part in the perception phases of the experiment.

A two-choice discrimination task was used in the perception phases. A pair of stimuli labeled A and B were presented on each discrimination trial and remained constant stimuli for that trial. Then either A or B was exposed briefly between the constant stimuli, and S was required to state which stimulus had been exposed. The stimuli consisted of sex-neutral, aggression-neutral, and a neutral-neutral pair.

In the subception phase, the stimulus magnitudes representing below awareness thresholds were determined for each S individually. Ss were then given a 40 trial discrimination series using the sex-neutral and aggression-neutral pairs.

In the perceptual defense phase, the stimulus magnitude was increased to a level, previously determined in a pilot study, at which approximately 50% correct discriminations of the neutral-neutral stimulus pair could be made. The stimulus magnitude remained constant for all Ss in this phase. Ss were given a 20 trial acuity test series using the neutral stimulus pair, and this was followed by a 40 trial discrimination series using the conflict-neutral stimulus pairs.

Total response accuracy and conflict-neutral category errors were recorded for Ss in both the subception and perceptual defense phases. The results of the subception phase revealed that:

1. There were no significant category error differences for the three groups.
2. There were no significant differences in response to the sex and aggression stimuli constituting the conflict category for the three groups.
3. Total response accuracy was not significantly greater than would be expected by chance for all groups.

The results provided no support for the hypothesis that all Ss would show subception to the conflict stimuli presented at stimulus magnitudes below awareness thresholds.

The data obtained in the perceptual defense phase were subjected to

both an inter-group and an inter-category analysis. The results may be summarized briefly as follows:

1. There were no significant differences among the three groups on the visual acuity test or in response to the neutral stimulus category.

2. There were no significant differences for the three groups in response to the sex and aggression stimuli constituting the conflict category.

3. Analyses of the data to determine the presence of extraneous variance such as might be related to adaptation effects, set, and sex of S yielded non-significant results.

4. All three perceptual defense hypotheses were supported by the inter-category analysis. The Avoidance group made significantly more errors in response to the conflict category as compared to the neutral category, while the reverse was true of the Projection group. The No Defense group show no significant inter-category response differences.

5. The Projection group was significantly more accurate in response to the conflict category than the other two groups. There was no significant difference between the Avoidance and No Defense groups in conflict category response.

On the basis of these findings and those of recent studies on subception and perceptual defense, it was concluded that:

1. Subception as measured by a verbal indicator does not occur when the stimuli are presented at magnitudes too low to permit a phenomenal report of awareness.

2. Ss respond differentially to threat in perception, and this differential responsivity can be predicted from a knowledge of Ss' characteristic ego defenses.

3. The differential response in perception cannot be explained as a function of response bias.

4. Ss who utilize one particular mechanism as a general ego defense show a similar generality in perceptual response.

The results support the plausibility of viewing perceptual avoidance and vigilance within a framework of defense, and further suggest that avoidance and vigilance in perception are directly analogous to the ego defenses of repression and projection.

Several questions for further research were raised. It was suggested that there is a need for: (a) a more precise definitions of awareness threshold; (b) further study of the autonomic or affective response as it relates to perceptual vigilance and sensitization; (c) and investigation of the perceptual learning process per se within the experimental setting.

REFERENCES

- ALLPORT, F. H. Theories of perception and the concept of structure. New York; Wiley, 1955.
- BARTLEY, S. H. Principles of perception. New York: Harper, 1957.
- BEIER, E. G., & Cowen, E. L. A further investigation of the influence of "threat-expectancy" on perception. J. Pers., 1953, 22, 254-257.
- BINDER, A. Personality variables and recognition response level. J. abnorm. soc. psychol. 1958, 57, 136-142.
- BITTERMAN, M. E., & KNIFFIN, C. W. Manifest anxiety and perceptual defense. J. abnorm. soc. Psychol., 1953, 48, 248-252.
- BLUM, G. S. A study of psychoanalytic theory of psychosexual development. Genet. Psychol. Monogr., 1949, 39, 3-99
- BLUM, G. S. An experimental reunion of psychoanalytic theory with perceptual vigilance and defense. J. abnorm. soc. Psychol., 1954, 49, 94-98.
- BLUM, G. S. Perceptual defense revisited. J. abnorm. soc. Psychol., 1955, 51, 24-29.
- BLUM, G. S. Defense preferences in four countries. J. proj. Tech., 1956, 20, 33-41.
- BRICKER, P. D., & CHAPANIS, A. Do incorrectly perceived tachistoscopic stimuli convey some information? Psychol. Rev., 1953, 60, 181-188.
- BROWN, D. R., & ADAMS, J. Word frequency and the measurement of value areas. J. abnorm. soc. Psychol., 1954, 49, 427-430.
- BRUNER, J. S. Personality dynamics and the process of perceiving. In R. R. Blake & G. V. Ramsey (Eds.), Perception: an approach in personality. New York: Ronald, 1951. Pp. 121-147. (a)
- BRUNER, J. S. One kind of perception: A reply to Professor Luchins. Psychol. Rev., 1951, 58, 306-312. (b)
- BRUNER, J. S., & POSTMAN, L. Emotional selectivity in perception and reaction. J. Pers., 1947, 16, 69-77.
- BRUNER, J. S., & POSTMAN, L. Perception cognition and behavior. J. Pers., 1949, 18, 14-31.

- BRUNER, J. S., & LINNURN, A. L. Perceptual identification and perceptual organization. J. gen. Psychol., 1955, 53, 21-28.
- CARPENTER, B., WIENER, M., & CARPENTER, JANETH T. Predictability of perceptual defense behavior. J. abnorm. soc. Psychol., 1956, 52, 380-383.
- CHODORKOFF, B. Anxiety, threat, and defensive reactions. J. gen. Psychol., 1956, 54, 191-196.
- COHEN, A. R. Experimental effects of ego-defense preference on interpersonal relations. J. abnorm. soc. Psychol., 1956, 52, 19-27.
- COWEN, E. L., & BEIER, E. G. The influence of "threat-expectancy" on perception. J. Pers., 1950, 19, 85-94.
- COWEN, E. L., & BEIER, E. G. Threat-expectancy, word frequencies and perceptual prerecognition hypotheses. J. abnorm. soc. Psychol., 1954, 49, 178-182.
- COWEN, E. L., & OBRIST, P. A. Perceptual reactivity to threat and neutral words under varying experimental conditions. J. abnorm. soc. Psychol., 1958, 56, 305-310.
- DASTON, P. G. Perception of homosexual words in paranoid schizophrenia. Percept. mot. Skills, 1956, 6, 45-55.
- DE LUCIA, J. L., & STAGNER, R. Emotional vs. frequency factors in word recognition time and association time. J. Pers., 1954, 22, 299-309.
- DIXON, N. F. The effect of subliminal stimulation upon autonomic and verbal behavior. J. abnorm. soc. Psychol., 1958, 57, 29-36.
- DULANEY, D. E. Avoidance learning of perceptual defense and vigilance. J. abnorm. soc. Psychol., 1957, 55, 333-338.
- EDWARDS, A. L. Experimental design in psychological research. New York: Rinehart, 1950.
- EDWARDS, A. L. Statistical methods for the behavioral sciences. New York: Rinehart, 1954.
- ERIKSEN, C. W. Some implications for TAT interpretation arising from need and perception experiments. J. Pers., 1951, 19, 282-288.
- ERIKSEN, C. W. Perceptual defense as a function of unacceptable needs. J. abnorm. soc. Psychol., 1951, 46, 557-564.

- ERIKSEN, C. W. Defense against ego threat in memory and perception. J. abnorm. soc. Psychol., 1952, 47, 230-285.
- ERIKSEN, C. W. The case for perceptual defense. Psychol. Rev., 1954, 61, 175-182.
- ERIKSEN, C. W. Subception: fact or artifact? Psychol. Rev., 1956, 63, 74-80.
- ERIKSEN, C. W., & BROWNE, C. T. An experimental and theoretical analysis of perceptual defense. J. abnorm. soc. Psychol., 1956, 52, 224-230.
- ERIKSEN, C. W., AZUMA, H., & HICKS, R. Verbal discrimination of pleasant and unpleasant stimuli prior to specific identification. J. abnorm. soc. Psychol., 1959, 59, 114-119.
- FENICHEL, O. The psychoanalytic theory of neurosis. New York: Norton, 1945.
- FORER, B. A. A structured sentence completion test. J. proj. Tech., 1950, 14, 15-29.
- FREEMAN, J. T. Set or perceptual defense? J. exp. Psychol., 1954, 48, 283-288.
- FREEMAN, J. T. Set versus perceptual defense: A confirmation. J. abnorm. soc. Psychol., 1955, 51, 710-712.
- FREUD, A. The ego and the mechanisms of defense. New York: International Universities Press, 1946.
- FREUD, S. Repression. In Collected papers. Vol. IV. New York: Basic Books, 1959, pp. 84-97.
- GILCHRIST, J. C., LUDEMAN, J. F., & LYSAK, W. Values as determinants of word recognition thresholds. J. abnorm. soc. Psychol. 1954, 49, 423-426.
- GOLDIAMOND, I. Indicators of perception: I. Subliminal perception, subception, unconscious perception: An analysis in terms of psychophysical indicator methodology. Psychol. Bull., 1958, 55, 373-411.
- GOLDSTEIN, S. A projective study of psychoanalytic mechanisms of defense. Unpublished Ph. D. dissertation, Univ. of Michigan, 1952.
- GOLDSTEIN, M. J., & BARTHOL, R. P. Fantasy responses to subliminal stimuli. J. abnorm. soc. Psychol., 1960, 60, 22-26.

- HAIGH, G. V., & FISKE, D. W. Corroboration of personal values as selective factors in perception. J. abnorm. soc. Psychol., 1952, 47, 394-398.
- HEATH, D. Projective tests as measures of defensive activity. J. proj. Tech., 1958, 22, 284-292.
- HOWES, D. H. On the interpretation word frequency as a variable affection speed of recognition. J. exp. Psychol., 1954, 48, 106-112.
- HOWES, D. H., & SOLOMON, R. L. A note on McGinnies' "Emotionality and perceptual defense." Psychol. Rev., 1950, 57, 229-234.
- HOWES, D. H., & SOLOMON, R. L. Visual duration threshold as a function of word-probability. J. exp. Psychol., 1951, 41, 401-410.
- HOWIE, D., Perceptual defense. Psychol. Rev., 1952, 59, 308-315.
- JENKIN, N. Affective processes in perception. Psychol. Bull., 1957, 54, 100-127.
- KURLAND, S. H. The lack of generality in defense mechanisms as indicated in auditory perception. J. abnorm. soc. Psychol., 1954, 49, 173-177.
- LACY, O. W., LEWINGER, N., & ADAMSON, J. F. Foreknowledge as a factor affecting perceptual defense and alertness. J. exp. Psychol., 1953, 45, 169-174.
- LAZARUS, R. S. Is there a mechanism of perceptual defense? A reply to Postman, Bronson and Gropper. J. abnorm. soc. Psychol., 1954, 49, 396-398.
- LAZARUS, R. S., ERIKSEN, C. W. & FONDA, C. P. Personality dynamics and auditory perceptual recognition. J. Pers., 1951, 19, 471-482.
- LAZARUS, R. S., & McCLEARY, R. A. Autonomic discrimination without awareness: A study of subception. Psychol. Rev., 1951, 58, 113-122.
- LINDNER, H. Sexual responsiveness to perceptual tests in a group of sexual offenders. J. Pers., 1953, 21, 364-374.
- LOWENFELD, J., RUBENFELD, S., & GUTHRIES, G. M. Verbal inhibition in subception. J. gen. Psychol., 1956, 54, 171-176.

- LUCHINS, A. S. An evaluation of some current criticisms of Gestalt work on perception. Psychol. Rev., 1951, 58, 69-95.
- LYSAK, W. The effects of punishment upon syllable recognition thresholds. J. exp. Psychol., 1954, 47, 343-350.
- McCLELLAND, D. C., & LIBERMAN, A. M. The effect of need for achievement on recognition of need-related words. J. Pers., 1949, 18, 236-251.
- McGINNIES, E. Emotionality and perceptual defense. Psychol. Rev., 1949, 56, 244-251.
- McGINNIES, E., & BOWLES, W. Personal values as determinants of perceptual fixation. J. Pers., 1949, 18, 224-235.
- McGINNIES, E., & SHERMAN, H. Generalization of perceptual defense. J. abnorm. soc. Psychol., 1952, 47, 81-85.
- MAUSNER, B., & SIEGEL, A. The effect of variation in "value" on perceptual thresholds, J. abnorm. soc. Psychol., 1950, 45, 760-763.
- MURDOCK, B. B., JR. Perceptual defense and threshold measurements. J. Pers., 1954, 22, 565-571.
- NEEL, ANN F. Conflict, recognition time and defensive behavior. Amer. Psychologist, 1954, 9, 437. (Abstract)
- NELSON, S. H. Psychosexual conflicts and defenses in visual perception. J. abnorm. soc. Psychol., 1955, 51, 427-433.
- NEWTON, K. R. A note on visual recognition thresholds. J. abnorm. soc. Psychol., 1955, 51, 709-710.
- OSLER, S. F., & LEWINSOHN, P. The relation between manifest anxiety and perceptual defense. Amer. Psychologist, 1954, 9, 446. (Abstract)
- POSTMAN, L. The experimental analysis of motivational factors in perception. In J. S. BROWN, H. F. HARLOW, L. POSTMAN, et al., Current theory and research in motivation: a symposium. Lincoln: Univer. of Nebraska Press, 1953. Pp. 59-108. (a)
- POSTMAN, L. On the problem of perceptual defense. Psychol. Rev., 1953, 60, 298-306. (b)
- POSTMAN, L., BRUNER, J. S., & McGINNIES, E. Personal values as selective factors in perception. J. abnorm. soc. Psychol., 1948, 43, 142-154.
- POSTMAN, L., & SCHNEIDER, B. Personal values, visual recognition and recall. Psychol. Rev., 1951, 58, 271-284.

- POSTMAN, L., BRONSON, W. C., & GROPPER, G. L. Is there a mechanism of perceptual defense? J. abnorm. soc. Psychol., 1953, 48, 215-225.
- POSTMAN, L., & CONGER, BEVERLY. Verbal habits and the visual recognition of words. Science, 1954, 119, 671-673.
- PRATT, C. C. The role of past experience in visual perception. J. Psychol., 1950, 30, 85-107.
- PRENTICE, W. C. H. "Functionalism" in perception. Psychol Rev., 1956, 63, 29-38.
- REYHER, J. The posthypnotic stimulation of hypnotically induced conflict: III Perceptual Vigilance and Perceptual Defense. In press.
- SOLOMON, R. L., & HOWES, D. S. Word frequency, personal values, and visual duration thresholds. Psychol. Rev., 1951, 58, 256-270.
- SOLOMON, R. L. & POSTMAN, L. Frequency of usage as a determinant of recognition threshold for words. J. exp. Psychol., 1952, 43, 195-202.
- SEGAL, A. B. Prediction of expressed attitudes toward the mother. Unpublished Ph. D. dissertation, Univ. of Michigan, 1954.
- SHIRE, A. Personality correlates of defense preferences. Unpublished Ph. D. dissertation, Univ. of Michigan, 1954.
- SPENCE, D. P. A new look at vigilance and defense. J. abnorm. soc. Psychol., 1957, 54, 103-108.
- STEIN, K. B. Perceptual defense and perceptual sensitization under neutral and involved conditions. J. Pers., 1953, 21, 467-478.
- STERNE, D. M. Duration thresholds in the perception of unpleasant words. Unpublished Ph. D. dissertation, Michigan State Univ., 1952.
- THORNDIKE, E. L., & LORGE, I. The teacher's word book of 30,000 words. New York: Columbia Univ. Press, 1944.
- VANDERPLAS, J. M., & BLAKE, R. R. Selective sensitization in auditory perception. J. Pers., 1949, 18, 252-266.
- VOOR, J. H. Subliminal perception and subception. J. Psychol., 1956, 41, 437-458.
- WALLACH, H. Some considerations concerning the relation between perception and cognition. J. Pers., 1949, 18, 6-13.

WIENER, M. Word frequency or motivation in perceptual defense. J. abnorm. soc. Psychol., 1955, 51, 214-218.

WYLIE, R. C. Cognitive set and motivational factors in the perception of neutral and threat stimuli. J. abnorm. soc. Psychol., 1957, 55, 227-233.

APPENDIX A
DISTRIBUTION OF SUBJECTS

Avoidance Group	Projection Group	No Defense Group
22 Subjects	18 Subjects	25 Subjects
10 Male	11 Male	11 Male
12 Female	7 Female	14 Female

Total Subjects = 65

APPENDIX B

THE DEFENSE PREFERENCE INQUIRY

I Oral eroticism

Rank all of the statements according to how well they seem to fit the situation.

- | | |
|----------------------|----------------------|
| 1 = fits best | 4 = fits fourth best |
| 2 = fits second best | 5 = fits worst |
| 3 = fits third best | |

- (Int) A. Blacky makes sure he eats heartily to facilitate the growth of healthy bodily tissues which will fortify him for activities which might lie ahead.
- (Rg) B. Blacky tends to act in the same helpless infantile way as when he was first born, often stuffing himself more than is good for him.
- (P) C. Blacky is busy getting his dinner here, but he thinks it is really Mamma who makes him eat so much all the time.
- (Rf) D. As Blacky eats, he thinks to himself that it's time he went after his own food rather than having to depend on Mamma.
- (A) E. When Blacky is busy with other things, he often forgets to come to eat, but here he's making up for lost time.

II Oral sadism

- (Rg) A. When Blacky gets angry, he often throws a temper tantrum like he did in his earlier days.
- (Rf) B. Blacky tries to pretend that he's ferocious, but when Mamma is around he is sure to be overly gentle, calm, and well-behaved.
- (Int) C. Blacky is a firm believer in the idea of releasing one's aggressions, so he feels justified in ripping Mamma's collar here.
- (A) D. Blacky is so intent on chewing the collar to pieces that he doesn't even realize that it belongs to Mamma.
- (P) E. In Blacky's own way of thinking, his family has been treating him so unfairly that he feels entitled to chew up the collar.

THE DEFENSE PREFERENCE INQUIRY

III Anal sadism

- (A) A. It may look like Blacky is relieving himself between his parents' houses, but possibly he's just digging a hole to bury a bone.
- (Int) B. Blacky knows Mamma and Papa are not going to like the spot he chose, but to his way of thinking a dog's physical well-being is extremely important.
- (Rg) C. The consequences of Blacky relieving himself there might very well make him wish he were a young puppy again.
- (P) D. Blacky thinks his behavior is perfectly all right because he senses that Mamma and Papa have been unreasonably irritated with him, even though their actions didn't show it.
- (Rf) E. Blacky figures that Mamma and Papa will be pleased to find him so clean and neat about covering his mess.

IV Oedipal intensity

- (Rf) A. Blacky is feeling irritable, but he'll cheer up when he realizes that Mamma and Papa love each other so much.
- (P) B. Though Blacky is the one behind the bushes, he's still upset by the thought that his parents are hiding their love-making from him in order to keep him out of the group.
- (A) C. At the moment Blacky is upset watching his parents together, but he'll soon forget his anger as he starts playing again.
- (Rg) D. As Blacky watches, he works himself into a fit of anger and helpless rage which will force Mamma to take care of him again.
- (Int) E. Blacky feels justified in getting angry here because he wants his parents to enjoy the other activities that he had planned.

THE DEFENSE PREFERENCE INQUIRY

V Masturbation guilt

- (Int) A. Blacky has come to believe that frequent explorations of this sort are necessary to learn more about the role of his sexual anatomy in the functioning of his body.
- (A) B. Though licking himself, Blacky isn't affected by sexual sensations and will soon move on to other parts of his body.
- (Rf) C. Blacky will soon give up this childish practice and will devote his time to more constructive activities.
- (P) D. Blacky is enjoying his discovery, but he knows that others often get very upset and guilty over such actions.
- (Rg) E. When Blacky gets puzzled by a strange new experience like this, he naturally thinks back to the "good old days" before such problems existed.

VII Overt Aggression¹

- (Int) A. Blacky is so perplexed and frustrated by the toy that he may lose control of his temper the way he did when he was a pup.
- (P) B. Blacky wants to mind his own business but he figures the toy dog is trying to start a fight by blocking his path.
- (A) C. Blacky is eagerly calling the family's attention to his new toy dog, which he is very proud of.
- (Int) D. Blacky feels justified in this furious outburst against the toy dog because, after all, discipline is vital to the development of a well-rounded personality.
- (Rf) E. Blacky is delighted to have this little companion to whom he can give advice, love, and affection.

¹The defense alternatives on Picture VII concern reactions to the overt expression of aggression rather than the identification process, which the picture is intended to convey in the standard Blacky.

THE DEFENSE PREFERENCE INQUIRY

VIII Sibling rivalry

- (A) A. Standing off at a distance like this, Blacky is impressed primarily by the fact that his family is such an intimate group.
- (Rf) B. Blacky is pleased to see Mamma and Papa being affectionate to Tippy, since he feels that Tippy deserves a turn at getting attention.
- (Int) C. Blacky believes that insight into his own jealousy of Tippy will enable him to handle himself better in competitive situations later on.
- (Rg) D. As Blacky watches the rest of the family, he'll act like a helpless infant so they will have to treat him like a baby the way they once did.
- (P) E. Blacky suspects that Tippy has been trying to win over Mamma and Papa because Tippy is envious of their feelings toward Blacky.

IX Guilt feelings

- (P) A. Blacky feels that he wouldn't be in the spot he's now in if others hadn't led him astray.
- (A) B. Blacky's unhappiness will force him to drift into other thoughts which don't bother him as much.
- (Int) C. Though he's suffering now, Blacky will come to realize that his code of ethics is needlessly strict and confining.
- (Rf) D. After an experience like this, Blacky will become a model of virtue and will scrupulously avoid any wrongdoing.
- (Rg) E. This experience proves so disturbing to Blacky that it will be a long time before he is able to act his age again.

APPENDIX C
PERCEPTUAL STIMULI



Sex-neutral stimulus pair



Aggression-neutral stimulus pair



Neutral-neutral stimulus pair

APPENDIX D

TOTAL ERRORS TO THE CONFLICT AND NEUTRAL STIMULUS

PRESENTATIONS FOR ALL SUBJECTS IN THE SUBCEPTION

SERIES

S	Avoidance Group		Projection Group		No Defense Group	
	Conf.	Neut.	Conf.	Neut.	Conf.	Neut.
1	8	2	12	14	10	9
2	10	11	7	10	12	8
3	15	8	9	11	11	10
4	11	9	8	10	11	11
5	8	14	9	10	8	11
6	9	10	9	13	9	9
7	14	10	12	10	12	7
8	11	9	9	9	4	6
9	11	8	12	8	10	14
10	10	6	12	12	11	8
11	9	9	9	6	7	8
12	10	9	9	10	9	11
13	5	18	9	12	13	6
14	8	9	11	6	13	14
15	8	10	5	9	14	9
16	13	8	11	7	9	11
17	9	7	8	12	14	5
18	8	10	11	5	11	9
19	9	11			10	10
20	8	9			10	8
21	10	9			7	8
22	10	10			14	13
23					10	11
24					9	9
25					8	8

APPENDIX E

TOTAL ERRORS FOR ALL SUBJECTS TO THE SEX AND AGGRESSION

STIMULI IN THE SUBCEPTION SERIES

S	Avoidance Group		Projection Group		No Defense Group	
	Sex	Agg.	Sex	Agg.	Sex	Agg.
1	2	6	5	7	5	5
2	4	6	4	3	7	5
3	6	9	5	4	5	6
4	7	4	3	5	6	5
5	3	5	4	5	3	5
6	5	4	5	5	5	4
7	7	7	6	6	6	6
8	6	5	5	3	0	4
9	4	7	6	6	5	5
10	4	6	5	7	6	5
11	5	4	5	4	4	3
12	5	5	4	5	5	4
13	4	1	2	7	5	8
14	3	5	5	6	8	5
15	4	4	4	1	9	5
16	6	7	4	7	4	5
17	3	6	5	3	9	5
18	5	3	6	5	4	7
19	4	5			3	7
20	3	5			7	3
21	6	4			2	5
22	3	7			9	5
23					6	4
24					6	3
25					3	5

APPENDIX F

NUMBER OF CORRECT DISCRIMINATIONS FOR ALL SUBJECTS

ON THE 40 TRIAL SUBCEPTION SERIES

S	Avoidance Group	Projection Group	No Defense Group
1	30	14	21
2	19	23	20
3	17	20	19
4	20	22	18
5	18	21	21
6	21	18	22
7	16	18	21
8	20	22	30
9	21	20	16
10	24	16	21
11	22	25	25
12	21	21	20
13	17	19	21
14	23	23	13
15	22	26	17
16	19	22	20
17	24	20	21
18	22	24	20
19	20		20
20	23		22
21	21		25
22	20		13
23			19
24			22
25			24

APPENDIX G

TOTAL CORRECT DISCRIMINATIONS FOR ALL SUBJECTS

ON THE ACUITY TEST SERIES

S	Avoidance Group	Projection Group	No Defense Group
1	8	14	18
2	13	13	12
3	10	17	13
4	11	14	10
5	15	10	18
6	14	16	15
7	14	14	16
8	11	9	15
9	10	12	11
10	12	10	9
11	16	11	12
12	12	13	10
13	13	8	10
14	11	15	17
15	15	15	16
16	10	12	16
17	12	10	11
18	15	15	10
19	10		14
20	11		13
21	12		11
22	12		8
23			12
24			11
25			10

APPENDIX H

TOTAL NUMBER CORRECT DISCRIMINATIONS FOR ALL SUBJECTS

ON THE PERCEPTUAL DEFENSE SERIES

S	Avoidance Group	Projection Group	No Defense Group
1	21	33	24
2	21	29	17
3	23	33	20
4	23	32	27
5	27	23	29
6	24	37	29
7	23	34	31
8	22	26	35
9	22	25	26
10	20	23	23
11	32	25	30
12	28	32	31
13	22	30	20
14	27	36	30
15	22	34	31
16	28	32	22
17	25	27	23
18	27	36	28
19	19		22
20	23		23
21	24		18
22	25		21
23			22
24			25
25			19

APPENDIX I

DIFFERENCE SCORES FOR ALL SUBJECTS BASED UPON TOTAL
CORRECT RESPONSES TO THE ACUITY AND DEFENSE SERIES

S	Avoidance Group	Projection Group	No Defense Group
1	13	19	6
2	8	16	5
3	13	16	7
4	12	18	17
5	12	13	11
6	10	21	14
7	9	20	15
8	11	17	20
9	12	13	15
10	8	13	14
11	16	14	18
12	16	19	21
13	9	22	10
14	16	21	13
15	7	19	15
16	18	20	6
17	13	17	12
18	12	21	18
19	9		8
20	12		10
21	12		7
22	13		13
23			10
24			14
25			9

APPENDIX J

NUMBER OF ERRORS TO THE CONFLICT AND NEUTRAL STIMULUS

PRESENTATIONS FOR ALL SUBJECTS IN THE DEFENSE SERIES

S	Avoidance Group		Projection Group		No Defense Group	
	Conf.	Neut.	Conf.	Neut.	Conf.	Neut.
1	12	7	1	6	8	8
2	9	10	7	4	13	10
3	12	5	2	5	7	13
4	7	10	2	6	4	9
5	10	3	8	9	6	5
6	10	6	2	1	8	3
7	10	7	3	3	4	5
8	9	9	5	9	3	2
9	11	7	5	10	6	8
10	9	11	9	8	9	8
11	4	4	7	8	6	4
12	8	4	5	3	2	7
13	13	5	7	3	12	8
14	7	6	1	3	6	4
15	11	7	2	4	5	4
16	5	7	4	4	10	8
17	9	6	5	8	12	5
18	6	7	1	3	7	5
19	12	9			11	7
20	11	6			10	7
21	6	10			10	12
22	8	7			11	8
23					9	9
24					10	5
25					12	9

APPENDIX K

TOTAL ERRORS FOR ALL SUBJECTS TO THE SEX AND AGGRESSION

STIMULI IN THE PERCEPTUAL DEFENSE SERIES

S	Avoidance Group		Projection Group		No Defense Group	
	Sex	Agg.	Sex	Agg.	Sex	Agg.
1	7	5	1	0	5	3
2	4	5	3	4	5	8
3	5	7	1	1	3	4
4	4	3	1	1	1	3
5	2	8	4	4	5	1
6	6	4	1	1	4	4
7	5	5	0	3	2	2
8	4	5	0	5	1	2
9	5	6	2	3	1	5
10	6	3	4	5	5	4
11	1	3	5	2	2	4
12	3	5	2	3	1	1
13	8	5	3	4	5	7
14	4	3	0	1	2	4
15	7	4	1	1	3	2
16	5	0	1	3	5	5
17	4	5	3	2	5	7
18	2	4	0	1	4	3
19	5	7	1	1	4	7
20	4	7			6	4
21	4	2			6	4
22	3	5			4	7
23					5	4
24					6	4
25					5	7

APPENDIX L

NUMBER OF CORRECT DISCRIMINATIONS FOR MALE AND FEMALE
SUBJECTS IN THE DEFENSE SERIES

S	Avoidance Group		Projection Group		No Defense Group	
	Male	Fem.	Male	Fem.	Male	Fem.
1	23	21	33	29	17	24
2	22	21	33	32	20	27
3	20	23	23	34	35	29
4	32	27	37	26	23	29
5	28	24	23	25	31	31
6	28	23	25	32	28	26
7	28	22	30	27	22	30
8	25	22	36		21	31
9	19	27	34		22	20
10	23	22	32		25	30
11	25	27	36		19	22
12		24				23
13						23
14						18

ROOM USE ONLY

NOV 4 1962

ROOM USE ONLY

~~SEP 6 1961~~

~~SEP 6 1961~~

~~SEP 6 1968~~