

THE EFFECT OF EMOTIONALLY LOADED
STIMULI ON VISUAL RECOGNITION THRESHOLDS;
AN INVESTIGATION OF THE PHENOMENON
AND PROCESS

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THE EFFECT OF EMOTIONALLY LOADED STIMULI ON VISUAL
RECOGNITION THRESHOLDS: AN INVESTIGATION OF
THE PHENOMENON AND PROCESS

By

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Part I of this study involved an attempt to substantiate the hypothesis that the frequently reported phenomenon of elevated recognition thresholds in response to emotionally loaded words is attributable to the subject's reaction to the threat value of the words.

A survey of the literature showed that many investigators had viewed the phenomenon as an artifact of experimental design. Among the factors suggested as accounting for the elevated thresholds were unequal familiarity with the stimuli, conscious suppression of response due to embarrassment or fear of censure, inappropriate statistical treatment of the data, and interference due to a "flinch" or startle response when the threatening stimulus was presented. An experimental procedure designed to render these factors inoperable was therefore employed.

Pronounceable, six letter nonsense words were employed as stimuli. These words were experimentally loaded by a conditioning procedure in which the words were used as names for characters in short stories describing picture-cards which the subjects were required to read. One half of the stories involved socially unacceptable behavior. The nonsense words used in the stories were alternated. Thus, one-half of the words were loaded for one group of subjects, while the other half of the words were loaded for the second group.

The words were then presented tachistoscopically to all subjects. A detailed record of each subject's pre-recognition

responses was taken. The exposure speed at point of recognition of each word was also recorded.

The mean exposure time required for recognition of loaded words was significantly greater than that for neutral words. A sign test established that a greater number of subjects than would be expected by chance had higher thresholds for loaded than for neutral words ($P = .0004$). Further analysis of the data revealed that some of the stimulus words were more difficult to recognize than others when their experimental emotional loading was held constant. It was found that a rise in recognition threshold when a word was loaded occurred less often when the word was among those least difficult to recognize when emotional loading was held constant.

In Part II of the study, diversion of insight was suggested as the process operating to produce the raised thresholds for loaded words. Diversion of insight was defined as a semi-conscious mechanism involving the suspension or interruption of the ability to make rational inferences from relevant perceptual cues, which is employed at the point when the individual has sufficient perceptual cues to provide a semi-conscious awareness or "hint" of the threat value of the stimulus. The individual thus postpones the anxiety that would accompany full recognition of the stimulus, but experiences a milder, generalized anxiety due to the semi-conscious awareness of threat that triggered the mechanism.

A post-experimental interview was conducted with each subject, and the data on pre-recognition responses was analyzed.

The analysis of these responses showed that subjects showing raised thresholds for loaded words progressed in the recognition of both loaded and neutral words with equal ease and rapidity up to the point where they had identified four of the six letters of the words. Beyond this point, more than twice as many additional exposures were required to complete recognition of loaded words, than were required to complete recognition of neutral words. This was interpreted as behavior identical to that which would be expected if the subjects had suspended the process of rational inference after having sufficient cues to give him a "hint" of the threat value of the stimulus. Three judges categorized each post-experimental interview as to the various levels of insight, awareness, and anxiety verbalized by the subject. A majority of the subjects showing raised thresholds for loaded words were placed in categories reflecting the kind and degree of insight and awareness expected of persons employing diversion of insight. A majority of the persons failing to show raised thresholds were placed in categories reflecting the kinds and degrees of insight not consonant with diversion of insight.

It was concluded that delayed recognition of emotionally loaded or threatening stimuli is the behavioral result of an attempt to defend against anxiety. It was further concluded that the mechanism underlying the delayed recognition (raised thresholds) could be conceived of as a process of diversion of

insight, and that the effectiveness and frequency of employment of this process increases with increasing complexity of the threatening stimulus.

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PART I

INTRODUCTION

Personality and Perception

The present day psychologist has become accustomed to the term "personality and perception", and the combining of these areas of investigation, once held separate, is now established and widely accepted practice. The term is used in connection with a wide field of investigation, varied in its techniques, problems and theoretical substructure, yet held together by the underlying assumption that personality dimensions and perceptual phenomena are interdependent. Studies in this area have, during recent years, been numerous, and have been reviewed and summarized by Blake and Ramsey (3). In many instances, the implied dichotomy is still maintained, at least on the theoretical level, and efforts are directed at showing relationships between personality characteristics and perceptual phenomena as though they were separate and distinct. This formulation has been challenged by Klein and Schlesinger (29), who state that the laws of perception may well be the laws of the perceiver. They go on to suggest that the organization by the individual of all response systems may be what we actually mean by personality.

Many experimental investigations have revealed the dynamic or motivational aspects of perceptual behavior. Perception is known to be structured not only with respect to the limiting stimulus condition, but also with regard to inter-sensory patterns, adaptation and set (22), the possibilities of reward (44, 46), need fulfillment (5, 33), attitudinal orientation (41), symbolic value (7), and other factors. Thus, we now commonly think of perception as simply another element of behavior, and as such, a resultant of the state of the organism, the past learning of the organism, the stimuli -- both internal and external -- impinging on the organism at any given time, and any other factor relevant to behavior in general.

Where theories of personality enter, so also enters the concept of "defense", and this has been the case with the field of personality and perception. Investigation of ego-defensive aspects of perceptual phenomena has become one of the sub-areas of the field of personality and perception.

Defense Mechanisms

The concept of defense is an extremely common one in psychology. The origins of the concept appear to date back almost to the beginnings of dynamic, or motivational, approaches to human behavior, and it is an integral part of all present day dynamic theories, though one encounters minor

variations in its conception from one theory to another. In general, a defense or a "defense mechanism" is conceived of as a learned response whose function is the protection of the individual from anxiety that would be aroused by certain stimuli.

A general view of defense mechanisms which would probably be acceptable to proponents of most dynamic theories is expressed by White (50). He states that when a person is frightened or threatened, the strongest impulse is, generally, to run from the frightening or threatening experience or situation. This cannot always be done however, because the action of running away is not always physically possible, and is sometimes as threatening to the ego (as a sign of weakness) as is the original threatening thing that one is running from. To come to terms with this circumstance, one acts in direct opposition to the impulse to avoid by making renewed contact with the threat with a new method of behavior designed to cope with it. This new method of behavior is the mechanism of defense, and usually becomes set and rigidified with respect to the frightening stimulus. It is then applied as a manner of dealing with all stimuli connected with the original by association. This same general conceptualization of defense mechanisms is stated by Anna Freud (20), and is in line with that expressed by Fenichel (18), who defines a defense mechanism, in effect, as learned behavior which is employed to protect the individual against anxiety which would be aroused by conscious, direct confrontation with certain stimuli.

The "Perceptual Defense" Phenomenon

Studies relating perception and memory to attitudes and conflicts of the individual have a productive history going back several decades. Gilbert (23) summarized the early work on the relationship of feeling to memory in 1938. Blake and Ramsey (3) summarized several decades of research on perception and personality variables in 1951. Discussions of defense mechanisms have abounded in the clinical literature ever since Freud's classical formulations, but much more rarely have these been subjected to experimental test. Recently, however, investigations of defense mechanisms as such, and investigations of perception have been formally wed. This union came about through a multitude of studies of the effect of threatening or anxiety-arousing stimuli on visual and auditory recognition thresholds. The raising of visual and auditory thresholds in response to threatening or anxiety arousing stimuli (the most frequently observed phenomenon) has come to be commonly referred to as "perceptual defense."

Interest in this so-called "perceptual defense" phenomenon has become widespread, as is evidenced by the number of publications that have appeared. This interest appears to have been sparked by a study published by Bruner and Postman (6) in 1947. In this study, the idea was put forth that misperception or failures of perception might represent attempts at defending oneself against threat or anxiety.

The multitude of published studies that have followed the above-cited study of Bruner and Postman seem to have been directed largely toward three purposes as follows. Some seem to have been designed to demonstrate that the so-called perceptual defense phenomenon is either (according to the orientation of the individual experimenter) the result of an unconscious attempt to defend against threat or anxiety, or the result of differential response availability or conscious response suppression. Others have apparently been directed toward defining variables relevant to either or both of the above interpretations of the phenomenon. Still others seem to have been largely methodological, dealing with new ways of experimentally eliciting the phenomenon. These three purposes or goals will be brought out in greater detail in the review of studies of "perceptual defense."

Purpose of Part I

The first part of this study is directed at investigating the hypothesis that anxiety-arousing or disturbing stimuli require significantly longer exposure times for correct identification than do emotionally neutral stimuli, and that this increase in perceptual threshold can be attributed to psychological processes arising from the disturbing nature of the stimuli.

SURVEY OF "PERCEPTUAL DEFENSE" STUDIES

The concept of perceptual defense was first formulated in connection with the analysis of recognition thresholds for words which were assumed to have emotional connotations such as to arouse anxiety in the majority of people.

In what seems to be the first reported study wherein the concept of perceptual defense specifically appears, Bruner and Postman (6) had 19 subjects give verbal associations to 99 words, and secured measures of their reaction time to each word. Working on the widely accepted hypothesis that both very long and very short reaction times indicate emotional reaction to the word, the experimenters chose the six words yielding the slowest reaction time, the six yielding the fastest reaction time, and the six yielding the midmost reaction time for each subject, and presented them, two weeks following the word association test, in a Dodge tachistoscope. The relationship between association time and recognition speed for each word was studied for each subject, and a curvilinear relationship was found. The correlation ratios for 17 of the 19 subjects were significant at the .01 level of confidence. From these results, the authors postulated that two mechanisms were operating. The first of these was designated as "perceptual defense", and was conceived of as a delay in the perceptual process similar to the blocking that causes

long reaction times to "loaded" words on a word association test. Its function was thought to be the prevention of anxiety that might occur from recognition of the word. The second mechanism was termed "perceptual sensitization", and was conceived of as a lowering of thresholds for stimuli of great personal relevance. It was assumed that, for some subjects, there was a critical degree of emotionality beyond which "perceptual defense" did not operate, and when this point was reached, the "dangerous" stimulus was met with utmost alertness and speed. This sensitization was called "selective vigilance".

In a follow-up study, as an extrapolation on the above concepts, Postman, Bruner and McGinnies (14) advanced the thesis that that which one sees or observes is always selected from a multitude of potential percepts, and that such perceptual selection is to some extent dependent on one's interests, needs and values. They chose the personality dimension of personal interest or value and attempted to relate this to perceptual selectivity. The 25 subjects in this study were given the Allport-Vernon Study of Values in an attempt to measure the personal value orientation of each. The subjects were then shown 36 words, one at a time, in a modified Dodge tachistoscope. The words were chosen to represent the six values -- theoretical, economic, aesthetic, social, political, and religious -- measured by the Allport-Vernon Study of Values. The recognition thresholds of each subject for each

word was determined. On comparing the recognition thresholds of the subjects with their personal value orientations, the experimenters proposed three mechanisms through which value comes to determine perceptual selection. First, value-orientation lowers the threshold for acceptable stimuli (selective sensitization); second, it raises the threshold for unacceptable stimuli (perceptual defense); and third, it induces the observer, even at exposure speeds so great as to lead to misperception, to perceive the stimulus as something that lies within the same value-area as his preferences (value resonance).

Following the appearance of the above two studies, there has been greatly increased interest in the role of personality factors, such as needs and values, in changing visual recognition thresholds. Studies have appeared with great rapidity and regularity, and the literature has been liberally sprinkled with claims and counterclaims, criticisms and counter-criticisms. Few personality theorists have remained free of involvement in this issue. The term "perceptual defense" has come to be applied to any case where a raised recognition threshold for any stimulus is observed, if some affective or valuative loading can be imputed to the stimulus. It has frequently been reported that stimuli of different need significance may have different visual recognition thresholds (6, 9, 12, 13, 35, 36, 39, 41, 42, 43, 53). Although theorizing in this area has lacked precision and completeness, it is possible to delineate

two main, general frames of reference which have been used to interpret the "need in perception" observations. The first might be termed the "response availability" approach, and the second the "dynamic" approach.

Writers using the concept of response availability have pointed out that, for different persons, some words have greater frequency of occurrence than others (27, 28, 29, 48), and thus are more familiar and more available. Differences in this response availability could act in two ways to produce differentiated recognition thresholds, depending in part upon the degree of ambiguity of the stimulus material. On the one hand, the subject is more likely to make use of minimal cues from words which are more readily at his disposal than from those which are not. This aspect of the concept appears to be very much like the old notion of attention or set. On the other hand, if the cues are so minimal that the subject appears to be guessing, the presence of certain words in his response repertoire will increase the statistical probability of these words being correctly identified.

Other workers, notably the writers oriented toward personality theory, have implied the unconscious participation of the individual in actively selecting or rejecting the presented material in accordance with his needs (12, 29, 36, 37). For example, McGinnies (36) summarizing some of the work in this area, states "It seems well established then, that the perceptual filtering of visual stimuli serves - often - to

protect the observer from an awareness of stimuli which have unpleasant emotional significance for him". In elaborating this type of approach, Eriksen (12) has talked about such variables as type of ego defense and the acceptability of the need -- factors which he believes can influence the degree to which the subject is able to verbalize and recognize the stimulus material.

Working in the context of the "dynamic" approach, McClelland and Liberman (35) found that subjects with high need-achievement, as measured by the TAT and an anagrams test, take longer to recognize achievement related words than do subjects with low need-achievement. The subject's familiarity with the stimulus words was not adequately controlled in this study.

Eriksen (13), in a follow up of his doctoral dissertation, found that the amount of associative disturbance (on a word association test) to aggressive, succorant, and homosexual words was positively related to the subjects recognition thresholds for scenes portraying aggressive succorant and homosexual activity. The choice of stimulus material in this study seems unfortunate due to the fact that it would appear to be nearly impossible to equate complex pictures for ease of recognition, regardless of the emotional significance of the pictures. Another similar study was also reported by Eriksen (14). In this experiment he found that subjects who blocked or showed indications of emotional disturbance to TAT

cards which generally elicit stories with aggressive themes, had higher recognition thresholds for aggressive than for neutral scenes presented tachistoscopically.

Postman and Schneider (42) attempted to control for word frequency (as measured by the Thorndike-Lorge word lists) while at the same time varying emotional significance of the stimulus. They found that the relation between value rank as measured by the Allport-Vernon test, and visual recognition was positive and significant. Significant differences were found between duration thresholds for both relatively high- and relatively low-frequency words as a function of value rank. Adams and Brown (1) criticize this study directly and state that the results can be predicted on the basis of assuming that for words representing a field of interest, valuation of that interest is associated with a departure from the mean frequency of use of the word in the general population.

A much more sophisticated study with pertinent implications for theory in the area of perceptual defense has been reported by Eriksen (15). In this study, two extreme groups were selected on the basis of whether they recalled more completed or incomplete tasks. They were later given a word association test, and tachistoscopic recognition thresholds were obtained for words on which the individual subject had shown a disturbance. Subjects in the completed task recall group showed elevated recognition thresholds on the stimulus words. Subjects in the incomplete task recall group showed no evidence of elevated

recognition thresholds on the stimulus words. Thus evidence of perceptual defense was found only in subjects in whom a predilection for an avoidance type defense had been demonstrated by the memory task.

Postman and Brown (39) investigated the possible immediate influences of experience on recognition thresholds. Their experimental design was so arranged that one group of subjects experienced success and another group failure on a set task. All subjects then were shown 24 words for tachistoscopic recognition -- 12 words neutral, and 12 concerned with success, deprivation, failure, or striving. Results showed the failure group to have a lower recognition threshold for deprivation words. The success group had a lower recognition threshold for goal words.

Cowen and Beier (9) report a study which is of interest because of its method of obtaining recognition thresholds. The subjects were shown 16 words, eight neutral in meaning, and eight dealing with threat. The words were in booklets, each consisting of 30 carbon copies of a single, typed word. The 30 copies were arranged in order from the most blurred to the clearest. The subjects were asked to decipher each word by going through the book until they reached a page on which the word was clear enough to permit them to identify it. The results showed threat-related words to be more slowly recognized. The authors also report that they found no evidence

for any relationship between recognition time and familiarity of the word.

In an attempt to resolve the controversy of word frequency or motivational factors as accounting for the elevated recognition thresholds for some words, Wiener (52) constructed a very clever experimental design. He embedded words with dual meanings (both "threat" and "neutral", i.e., "fairy") in two lists of words. The first list had neutral words and was expected to promote the neutral meaning of the dual words. The second list contained all threat words and was expected to promote the threat meaning of the dual words. Each list was presented to a different group of subjects by the method used by Cowen and Beier (9), already described above. It was found that dual words embedded in threat lists were recognized earlier than when embedded in neutral lists. Thus the author found evidence for "perceptual sensitization" or "vigilance," but none for "perceptual defense."

The response availability approach to the area of perceptual defense was originated by Howes and Solomon (27). In a review of McGinnies' (36) study, they questioned his conclusion, reanalyzed the data, and demonstrated that there was an inverse relationship between recognition threshold and familiarity with a stimulus word as measured by its frequency of occurrence in extensive samples of the English language. They also suggested that subjects might hesitate to verbalize

"dirty" or obscene words due to embarrassment, since strong social taboos against public use of these words exist.

Following up their criticisms of the dynamic explanation for perceptual defense phenomena, Howes and Solomon (28) demonstrated a strong, inverse relationship between relative word frequency and duration threshold for tachistoscopically presented words. The frequency of the stimulus words was determined by the Lorge Magazine Count and the Lorge-Thorndike Semantic Count.

In a later theoretical article, apparently in criticism of the study of Postman, Bruner and McGinnies (41), Solomon and Howes (47) state that since duration threshold is related to word frequency, the relationship of duration threshold to value rank on the Allport-Vernon test can be accounted for by assuming that for words representing a field of interest, valuation of that interest is associated with a departure from the mean frequency of use in the general population. From this point, they further postulate that the Allport-Vernon test itself can be considered a measure of the frequency with which the subject uses certain words.

In a later, more complex study, again directed at substantiating their response availability hypothesis, Solomon and Howes (48) criticized previous attempts to control for frequency of words in perceptual defense studies on the basis that frequency of usage in the general population by use of Thorndyke-Lorge word counts is the factor that has actually

been controlled. This, they state, does not control for frequency in the individual subjects. In this study, pronounceable nonsense syllables were used as stimulus words. The subjects were given varying numbers of trials at pronouncing the syllables, thus varying their frequency of usage exactly. The syllables were then presented tachistoscopically, and a very significant, inverse relationship between frequency of usage and recognition threshold for the syllables was found.

One of the underlying assumptions of the dynamic approach to the so-called perceptual defense phenomena has been that the subject can get cues or some meaningful signal from a stimulus he cannot identify, without being aware that he is receiving the cue or signal. Unless this can be established, the entire structure becomes meaningless in a dynamic sense.

To check on the possibility of meaningful response to a stimulus which the subject cannot consciously perceive, Lazarus and McCleary (32) conducted an experiment wherein subjects were required to learn a list of nonsense syllables, half of which were paired with shock. The syllables were then presented to the subjects by tachistoscope, and a GSR record of each subject during the tachistoscopic presentation was obtained. It was found that duration threshold was higher for the shocked syllables, and that significant increases in GSR occurred before the shocked syllables were recognized by the subjects. The authors conclude that at tachistoscopic speeds

too rapid for correct recognition, subjects are able to make discriminatory responses as measured by their GSR.

Bricker and Chapanis (4) regard as unfortunate the implication that Lazarus and McCleary have found evidence for some sort of unconscious determination of behavior. They prefer to hypothesize that even when the subject's first verbal response is wrong, the stimulus may still convey some useful information to him. Their study suggested that significantly fewer additional guesses are needed to identify incorrectly perceived stimuli than to make the correct response in a series of random guesses. The authors conclude that the subject may receive meaningful cues from the stimuli and still make wrong verbal responses. The cues may have the effect of narrowing possible responses to a few, or of establishing for the subject a class or group of stimuli of which he is certain that the stimulus just presented was, or was not, a member.

The possibility that perceptual defense phenomena might be attributable to conscious suppression of response was suggested, as was previously stated, by Howes and Solomon (27), and was investigated experimentally by Whittaker, Gilchrist, and Fischer (51). In this study, three groups of subjects were used -- one group of prejudiced whites, one of low prejudiced whites, and one Negro group. One white and one Negro experimenter each ran half of the subjects in each group on a word recognition task, the stimulus words being positive, neutral, and negative value descriptions of people, and also

and some derogatory of negroes. The words were presented at very low illumination, and the illumination gradually increased until the words were correctly identified. It was determined from the records of the Negro subjects tested by the Negro experimenter that they had recognized the words derogatory to Negroes before reporting them, but had suppressed the response.

As was mentioned earlier, some aspects of the response availability approach to perceptual defense appear to have much in common with the older concepts of attention or set. Luchins (34) has criticized the entire concept of perceptual defense on the basis that the observed phenomena can be handled in terms of set. No additional structure, he says, is necessary.

Lacey, Lewinger, and Adamson (30) presented tachistoscopically to three groups, 15 infrequently encountered non-taboo words and 15 obscene taboo words. The words were presented to each group under one of three conditions: no foreknowledge of the words, generalized foreknowledge of the kinds of words, and specific foreknowledge of the words. In the group having no foreknowledge of the words, the usual perceptual defense phenomena was found (higher recognition thresholds for taboo words). In general, it was found that recognition thresholds dropped as foreknowledge increased. This was markedly true for taboo words. Under conditions of general and specific foreknowledge, thresholds were lower for taboo words than for neutral words.

In a similar study, Freeman (19) presented taboo and neutral words tachistoscopically to an experimental and a control group. The experimental group was told to expect taboo words. Recognition thresholds in this group were found to be significantly lower for taboo than neutral words. No similar sensitization effect was found in the control group. The experimenter then changed the first letters of the taboo words, making them taboo-like. The experimental group was again told to expect taboo words. During tachistoscopic presentations they gave taboo prerecognition responses to the taboo-like words, and showed a marked sensitization to words immediately following.

A large number of studies and analyses dealing with possible determinants or correlates of the phenomena of perceptual defense have appeared in the literature. Some of these are tangential to the concept, and do not appear to be relevant here. Others, however, are more directly concerned with personality and behavioral variables that might be highly relevant for theory construction in this area. Still others illustrate methodological approaches to research or investigation of the so-called perceptual defense phenomena in sense modalities other than vision.

McGinnies and Sherman (38) tachistoscopically presented taboo words followed by neutral words, and neutral words followed by neutral words to a group of 20 subjects. They found higher recognition thresholds for neutral words that followed



taboo words than for neutral words that followed neutral words. The authors concluded from this that they had found evidence pointing toward a generalization of perceptual defense similar to the response generalization observed in conditioning experiments.

Bitterman and Kniffin (2) investigated the relationship between manifest anxiety level and increased recognition thresholds for emotional stimuli. They administered the Taylor Anxiety Scale to a group of subjects and chose 20 with very high and 20 with very low scores for the perceptual defense part of the study which used the usual taboo and neutral words presented by tachistoscope. They found significant differences between their two groups. Manifest anxiety level appeared to bear no relation to the extent or intensity of "perceptual defense" manifested by the subjects.

Postman and Solomon (43) found no significant relationship between recognition threshold for words related to incompleting tasks and Zeigarnik effect. They did find evidence that recency of exposure to stimulus words was directly related to speed of recognition however.

Postman and Bruner (40) found evidence that frustrating experiences interspersed between sessions of practice at tachistoscopic recognition prevents the learning that would normally take place. Under these conditions it was found that there was no lowering of recognition thresholds through practice, and that primitivization or regressive behavior --

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making of nonsense hypotheses as to nature of words, and too early and random attempts at identification -- resulted.

Vanderplas and Blake (49) carried out what was essentially a replication of the Postman, Bruner, and McGinnies (41) study, but on the auditory sense modality. They recorded words and presented them to subjects in increasing volume until recognized. Results indicated that words concerned with the subject's high value areas (as determined by the Allport-Vernon Study of Values) were recognized at lower volume than words not concerned with value areas. Their study gives evidence of sensitization in auditory perception, as a function of personality variables.

A study by Lazarus, Eriksen, and Fonda (31) gives evidence of auditory perceptual defense against sexual or aggressive words in subjects who had previously been shown to manifest a repressive or blocking kind of behavior to sexual or aggressive stimuli.

In a recent survey of the literature on "perceptual defense," Eriksen (16) criticizes the scepticism about the idea of "unconscious perception" which led to attempts to explain so-called perceptual defense phenomena in terms of relative familiarity with the stimulus words and conscious suppression of response. He states that a basic assumption underlying the theory of defense mechanisms is that the person is able to detect the presence of anxiety-arousing stimuli before he is conscious of them. If this were not so, the defense could not

perform its function of keeping the anxiety from reaching conscious awareness. The author further asserts that in order to adequately test the perceptual defense hypothesis, it is necessary to establish two things. First, that the stimuli used are actually anxiety provoking for the individual subject, and second that he has learned to deal with anxiety from this source by employing avoidance reactions. Most of the work purporting to demonstrate "perceptual defense" has been inadequate in one or both of these requirements, he believes. The "dirty word" procedure used in most experiments does not insure that the words are anxiety-arousing for all or most of the subjects, does not control for relative familiarity of the stimulus words, and offers the possibility that the subject may deliberately delay his report owing to embarrassment. He concludes that the concept of perceptual defense is still a confused and controversial issue, mainly because of the poorly conceived research on the problem.

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EXPERIMENTAL DESIGN

Rationale

In view of previous studies in this area, it would appear that the relative familiarity of stimulus objects and their relative structural complexity must be adequately controlled to eliminate the possibility that any observed variation in recognition threshold is a function of these variables. It would appear necessary to eliminate the likelihood of the subject's consciously suppressing their reports of recognition of the stimulus due to embarrassment or fear of censure for reporting a stimulus object that is socially unacceptable, and to insure, in so far as possible, that the stimulus is actually disturbing or anxiety-arousing.

On reviewing the literature, it appears that previous studies are open to criticism on one or more of these points. Studies using "dirty words" as stimuli certainly do not eliminate the possibility of the subjects consciously suppressing their responses due to embarrassment, fear of censure, or even moral or religious scruples against using these words, nor do they give assurance that the words are disturbing or anxiety-producing. It also appears unlikely that such studies can be adequately controlled for word familiarity; since "dirty" words are common in discourse, and relatively rare in print,

any attempts to match them with "neutral" words by use of word-count lists seems to be without validity. The use of pictures or cartoons as stimuli as in studies by Clapp (8), or Eriksen (13), or sentences as in a study by Rosenstock (45) presents the very difficult task of equating the stimuli for structural complexity. The use of words to which the subjects have shown disturbances on word-association tests would also seem to make it impossible to equate the stimuli for familiarity. The fact that the subject shows disturbance when presented with the word seems to argue that his exposure to it would be, in some way, deviant from his exposure to, or experience with, words of similar frequency of occurrence in writing.

The answer to the above criticisms would appear to lie in an experimental design controlling the structural complexity of stimuli with which the subjects had had no experience prior to the experiment, and "loading" part of these stimuli in some way that would make them disturbing or anxiety-producing to the subjects. In employing this kind of procedure, one would have to make sure that the process by which the stimuli were "loaded" gave the subject equal exposure to both loaded and neutral stimuli. Studies of this sort have utilized nonsense syllables, and have "loaded" certain of the syllables by presenting them contiguously with electric shock. This procedure presents another difficulty. It is possible, as pointed out by Hochberg, Haber, and Ryan (25), that in the process of such conditioning where a physical punishment is used, "flinch" or

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"startle" response may also be conditioned to the stimulus. This startle response, intervening between exposure of the stimulus and the subject's report, may be sufficient to eradicate the weak memory trace of the stimulus laid down by the very brief exposure, even within the very short time span between exposure and response. Thus the greater time necessary for recognition of the shocked stimuli could represent an interference phenomenon.

It appears possible to avoid the above mentioned difficulties by "loading" certain of the stimuli by contiguous association of the stimuli with situations or events that can reasonably be considered to be disturbing, anxiety-producing, or ego-alien to the great majority of persons in our culture. The stimuli thus treated should then become disturbing. This procedure would, of course, also be a conditioning procedure, but one that did not utilize a physical punishment as an unconditioned stimulus. In this instance, a second order conditioning would be attempted, with the disturbing, anxiety-producing, or ego-alien situation (itself having acquired these properties through a conditioning process at an earlier time) being the unconditioned stimulus, and the experimental stimulus being the conditioned stimulus.

The following experimental design was constructed with the above points in mind. In constructing this design, an attempt was made to take into consideration all the published criticisms of previous studies, and to provide a situation in which they were not applicable.

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Subjects

The subjects for the experiment were 46 male, undergraduate college students, taken from the Psychology 101 and Psychology 201 classes at Michigan State University. A total of 60 students were taken from these classes, and the experimental group of 46 selected on the following bases:

1. They were determined to be psychologically naive -- that is, to have had no more than one undergraduate course in psychology.
2. It was determined that their uncorrected vision was such that they could identify a six letter word (window) typed in capital letters on gray construction paper, when this word was presented to them for .75 of a second in a tachistoscope.
3. None of the selected subjects, by their own admission had a history of psychological maladjustment severe enough to have required hospitalization or prolonged psychiatric or psychological treatment.
4. Selected subjects reported no history of reading difficulties requiring remedial assistance.

All students taken from the classes were volunteers. They were offered various incentives (extra credit) by their instructors for serving as experimental subjects, even if they were not chosen for inclusion in the experimental group.

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Materials and Apparatus

Conditioning Materials

1. Four 8" x 11" manila picture cards were constructed as described below.

Cards I and II, which will be referred to as the "brother and sister cards," had identical backgrounds (board fence enclosed patio without furnishings, and identically formed and placed cloud formations) drawn in ink. Two human figures of similar size and dressed in casual attire, cut from achromatic magazine illustrations - one a young man and the other a young woman - were pasted on the background.

Cards III and IV, which will be referred to as the "father and son cards," had identical backgrounds (an unfurnished room with a closed doorway at the extreme right, and a stairway at the extreme left) drawn in ink. Two human figures of similar size and dressed in street attire, cut from achromatic magazine illustrations - one a young man and the other an obviously older man - were pasted on the background.

2. Eight story-cards were constructed as described below.

A short paragraph, describing the people in the picture cards and their activities, was typed on eight 3" x 5" cards. These descriptive paragraphs (or stories) designated names for both of the characters in the picture described, the names being pronounceable, six letter, nonsense words.

Stories Ia and Ib (describing picture card I) both used the same names for the characters in the picture. Story Ia described the characters as a brother and sister who engage in incestuous relations, while story Ib described them as a brother and sister in a normal, or "neutral" relationship.

Stories IIa and IIb (describing picture card II) were the same as Ia and Ib, except that different nonsense words were used as names for the characters.

Stories IIIa and IIIb (describing picture card III) both used the same names for the characters in the picture. Story IIIa described them as father and son, with the son planning to kill his father, while story IIIb described them as father and son in a cooperative relationship.

Stories IVa and IVb (describing picture card IV) were the same as IIIa and IIIb, but used different nonsense words as names for the characters. (See Appendix A for the eight stories.)

3. A dummy "psychogalvanometer" was constructed. This was fitted with copper disc electrodes held to the subject's hand by an elastic cuff, to which they were attached.

Stimulus Materials

On a 3" x 18" strip of dark gray construction paper, 15 words were typed in capital letters on an electric typewriter to insure uniformity of spacing and density of the letters. The words were centered on the strip, and each placed five

spaces below the preceeding word. Following is a list of the words in order of their placement on the strip, from top to bottom. The last eight words are the names used in the stories for the characters in the four picture cards.

- | | | |
|-----------|------------|------------|
| 1. WINDOW | 6. INTKUB | 11. LYGIP |
| 2. KASTON | 7. JOLENT | 12. AMTRUP |
| 3. DEVROW | 8. BURKOL | 13. WERDAN |
| 4. FAXSET | 9. ELVNAS | 14. VALNIT |
| 5. GURNIS | 10. RELDAX | 15. HILPAR |

Exposure Apparatus

A Gerbrands tachistoscope with a .01 second interval exposure timer was equipped as follows. A sheet of dark gray construction paper, identical in shade to the strip on which the words were typed (described above), and free of irregularities to the unaided eye, was fitted to the background frame. The stimulus frame was constructed of a non-reflecting black material with a rectangular opening in the center. The back of this frame was equipped with rollers to which the construction paper strip bearing the stimulus words was attached.

This arrangement presented the subjects with a constantly illuminated gray field between exposures of the stimulus. When the timer button was pressed the field blacked out, except for a rectangular area in the center, where the stimulus appeared on a gray background of the same shade and illumination as the constantly illuminated field visible between exposures. When it became necessary to present a new stimulus word, this could be accomplished by rolling up the strip

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bearing the stimulus words until the desired stimulus word was centered in the rectangular opening of the stimulus frame.

Procedure

The 46 experimental subjects were divided into two groups, A and B, each having 23 subjects. The assignment to groups was random, subjects being assigned alternately to A or B in the order of scheduled appointments.

Procedure for Group A

The subjects were taken into the experimental room individually, and told that they were to act as subjects in a study of the relationship between PGR and visual recognition speed, and that the procedure would require approximately two hours. They were asked their name, marital status, number and sex of siblings, all-college grade point average, and whether both parents were living. They were also asked if they had ever been hospitalized for a nervous disorder, been treated by a psychiatrist or psychologist, or been to the counseling center. If the reply to any of these questions was affirmative, they were asked to give details. Three were dropped from the sample at this point due to a history of repeated visits to the counseling center.

The subject was next seated at the tachistoscope and given the following instructions:



"Look into the eyepiece, and you will see a lighted gray screen. I want you to focus on the center of that screen. When I push this release button, all of the screen, except a small rectangular area in the center, will be darkened. A word will appear in the small gray area in the center, for a short time. Look carefully, and tell me what the word is. This machine will give you the impression of looking through a camera shutter. The word will only be there for a short time, so you have to look fast."

The word WINDOW was then exposed for .75 of a second. Those subjects who could not identify the word correctly on the third exposure were dropped from the experimental group.

Any subject correctly identifying the word, was taken away from the tachistoscope and seated at the opposite side of the room. The following instructions were then given.

"I'm now going to fasten these two electrodes to your left hand by means of this elastic strap. The electrodes are connected to a galvanometer which will record changes in PGR. I will then show you four pictures one at a time. The pictures have small cards, describing the people and their activities, attached to them. I want you to look at each picture carefully, and read each card

aloud twice, so I can get two separate measures of PGR for each card. You will notice that the people in the pictures are given nonsense names. This is so you won't associate them with anyone you ever heard of. The nonsense names are pronounceable, so don't let them throw you; just pronounce them as you read, the same as if they were actual names. Remember, read each card aloud twice. Now turn your chair so that you are facing away from me and the machine."

When the subject had arranged himself according to instructions, he was handed the four picture cards in a random order. Picture-card I had story Ia attached; II had story IIb attached; III had IIIa attached; IV had story IVb attached. Thus, under this condition, picture cards I and III were emotionally loaded, while II and IV were neutral. The words BURKOL and ELVNAS were associated with brother-sister incest, and the words AMTRUP and WERDAN were associated with patricide. The words RELDAX, LYNGIP, VALNIT, and HILPAR were associated with neutral situations. After all four picture-cards had been presented, and each story read aloud twice, the subject was given a ten minute rest period out of the experimental room.

At the end of the rest period, the subject was again seated at the tachistoscope, and given the following instructions.

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"I am now going to show you a series of 14 words. Each of these words will flash on the screen for a very short period of time. As we start out with each word, it will come so fast that you may not be able to see it clearly, but I want you to make a guess at it anyway. Tell me anything that you see or think you see, even if you are not sure of it -- any part of the word that you catch. I'll keep flashing the words on the screen for just a little longer each time until you see the entire word correctly. These words are not real words, that is, they have no actual meaning, but they are pronounceable. Remember, tell me anything you see on each exposure of the word, and try to pronounce it. As soon as you've seen the word correctly, I'll change to a new word."

The first six nonsense words were then presented. The presentation of these words was always in the same order, as their function was to allow for decrease in exposure speed necessary for correct recognition, as a function of practice effects. A record was kept only of the exposure speed at which correct pronunciation of the word took place. Considerable trial and error manipulation of initial exposure speeds was necessary on the first two or three practice words in order to determine an initial exposure speed which would be below the subject's threshold.

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A rough average of the exposure speed at correct pronunciation on the last three practice words was determined by inspection, and a speed .08 of a second faster than this average was selected as the initial exposure speed for all the experimental words.

The eight experimental words were then presented in a random order. All words were initially presented at the same exposure speed, and this speed was gradually decreased by .02 second intervals on each subsequent exposure until correct pronunciation occurred. A detailed record of the subject's pre-recognition guesses at each exposure was kept, and the exposure speed at correct pronunciation was recorded.

Procedure for Group B

The procedure here was identical with that for group A, except for the pairing of stories and picture-cards.

For this group, card I had story Ib attached, card II had story IIa attached, card III had story IIIb attached, and card IV had story IVa attached. Thus, picture-cards II and IV were emotionally loaded while I and III were neutral. The words RELDAX and LYGIP were associated with brother-sister incest, and VALNIT and HILPAR were associated with patricide, while BURKOL, ELVNAS, AMTRUP, and WERDAN were associated with neutral situations.

While all subjects were presented tachistoscopically with all eight experimental words, the four words which were neutral

for *group* A subjects were emotionally loaded for group B subjects, and the four words which were emotionally loaded for *group* A subjects were neutral for group B subjects.

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TREATMENT OF THE DATA AND RESULTS

Inspection of the obtained exposure times at recognition, for neutral and loaded words, suggested that the distributions of these exposure times might depart sufficiently from normal to cast doubt upon a parametric test of the significance between the mean exposure time for loaded words, and the mean exposure time for neutral words. Frequency polygons of mean exposure times for neutral and loaded words were constructed (see Figures I and II), and these reinforced the doubt that a parametric test would yield valid results, since both distributions were positively skewed to a marked degree. A t test for correlated samples was, however, applied to the difference between the mean exposure times for loaded and neutral words, using the formula supplied by Guilford (24). As a check on this statistic, in view of the skewed distributions, a sign test was also applied to the differences between the mean exposure times for loaded and neutral words, using the method suggested by Edwards (11).

The obtained data on exposure time at correct recognition for all words for the 23 subjects in group A is shown in Table 1. The same data for the 23 subjects in group B is shown in Table 2.

The mean exposure time, at correct recognition, for loaded words was found to be 0.18 seconds, while the mean for neutral

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TABLE 1
EXPOSURE TIME IN SECONDS, AT CORRECT PRONUNCIATION, FOR
GROUP A ON BOTH LOADED AND NEUTRAL WORDS

(Plus sign indicates mean loaded greater than mean neutral)

Subject	Loaded					M	Neutral				M	Sign
	BURKOL	ELVNAS	AMTRUP	WERDAN			RELDAX	LYNGIP	VALNIT	HILPAR		
1	.20	.16	.16	.20		.180	.14	.12	.10	.12	.120	+
2	.18	.14	.14	.16		.155	.14	.12	.10	.14	.125	+
3	.20	.18	.18	.22		.195	.18	.20	.14	.18	.175	+
4	.10	.10	.12	.28		.150	.08	.08	.08	.10	.085	+
5	.14	.26	.10	.34		.210	.22	.12	.16	.12	.155	+
6	.14	.20	.08	.12		.135	.08	.08	.10	.12	.095	+
7	.40	.48	.30	.34		.380	.24	.18	.28	.18	.220	+
8	.07	.11	.13	.09		.100	.09	.05	.05	.07	.065	+
9	.10	.10	.10	.14		.110	.08	.08	.06	.04	.065	+
10	.10	.26	.18	.18		.180	.10	.14	.16	.10	.125	+
11	.32	.24	.34	.20		.275	.20	.18	.13	.28	.210	+
12	.28	.22	.34	.26		.275	.24	.40	.24	.22	.275	-
13	.30	.34	.14	.18		.240	.14	.12	.24	.18	.170	+

TABLE 1 (Cont..)

Subject	Loaded				M	Neutral				M	Sign
	BURKOL	ELVNAS	AMTRUP	WERDAN		RELDAX	LYNGIP	VALNIT	HILPAR		
14	.26	.22	.14	.18	.200	.16	.08	.10	.08	.105	+
15	.29	.21	.23	.27	.250	.23	.27	.17	.21	.220	+
16	.07	.08	.07	.10	.080	.09	.07	.14	.08	.095	-
17	.24	.27	.23	.47	.300	.25	.25	.15	.38	.260	+
18	.05	.09	.09	.07	.075	.05	.07	.07	.07	.065	+
19	.33	.27	.23	.31	.285	.21	.21	.19	.15	.190	+
20	.14	.24	.10	.06	.135	.06	.10	.10	.10	.090	+
21	.24	.30	.32	.28	.285	.22	.32	.22	.24	.250	+
22	.22	.10	.10	.26	.170	.10	.16	.20	.12	.45	+
23	.33	.40	.25	.42	.350	.31	.29	.29	.31	.300	+

TABLE 2

**EXPOSURE TIME IN SECONDS, AT CORRECT PRONUNCIATION, FOR
GROUP B ON BOTH LOADED AND NEUTRAL WORDS**

(Plus sign indicates mean loaded greater than mean neutral)

Subject	Neutral			M	Loaded			M	Sign
	BURKOL	ELVNAS	AMTRUP	WERDAN	RELDAX	LYNGIP	VALNIT	HILPAR	
1	.14	.10	.16	.12	.130	.20	.14	.32	.240 +
2	.08	.06	.08	.10	.080	.10	.06	.10	.085 +
3	.12	.14	.14	.16	.140	.20	.18	.22	.205 +
4	.08	.08	.08	.06	.075	.10	.04	.08	.085 +
5	.20	.22	.18	.16	.190	.20	.24	.18	.200 +
6	.30	.22	.22	.26	.250	.31	.28	.26	.300 +
7	.07	.05	.15	.05	.080	.09	.05	.09	.115 +
8	.17	.27	.31	.15	.225	.15	.17	.21	.180 -
9	.12	.10	.12	.12	.115	.12	.14	.10	.120 +
10	.11	.07	.07	.05	.075	.07	.07	.09	.085 +
11	.12	.16	.12	.10	.125	.16	.24	.18	.205 +
12	.11	.07	.11	.07	.090	.05	.13	.11	.100 +
13	.10	.10	.16	.28	.160	.12	.14	.14	.35 -

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TABLE 2 (cont.)

Subject	Neutral				M	Loaded				M	Sign
	BURKOL	ELVNAS	ANTRUP	WERDAN		RELDAX	LYNGIP	VALNIT	HILPAR		
14	.26	.26	.26	.26	.260	.26	.28	.34	.24	.280	+
15	.05	.07	.07	.05	.069	.07	.07	.12	.13	.120	+
16	.10	.20	.16	.10	.140	.16	.18	.10	.10	.135	-
17	.07	.09	.13	.13	.105	.09	.05	.07	.15	.090	-
18	.05	.31	.09	.11	.140	.16	.03	.09	.05	.107	-
19	.18	.26	.20	.24	.220	.26	.16	.26	.18	.125	-
20	.05	.21	.21	.07	.135	.09	.07	.05	.09	.075	-
21	.12	.10	.10	.14	.115	.08	.08	.08	.08	.080	-
22	.12	.12	.12	.14	.125	.12	.12	.10	.12	.115	-
23	.31	.33	.29	.37	.325	.31	.41	.37	.35	.360	+

words was found to be 0.15 seconds. The difference between the means was 0.03 seconds. The value of t (for correlated samples) was calculated to be 4.79, which is significant beyond the .01 point for a one-tailed test with 45 degrees of freedom.

For the sign test, each subject having a higher mean threshold for loaded words than for neutral was assigned a plus sign, and the opposite condition was assigned a minus sign. In a sample of 46 subjects, the expected number of plus signs would be 23, if no difference in threshold for loaded and neutral words existed. The standard deviation of a distribution of 46 was found to be 3.39. The obtained number of plus signs was 35, and thus z , corrected for continuity, was calculated to be 3.39, which was significant at the .0004 point for a one-tailed test. Thus the results of the sign test show that a greater number of subjects than would be expected by chance in the experimental group had a higher mean threshold for loaded words than for neutral words.

Although the order of presentation of the stimulus words was randomized so that effects of order of presentation (progressive improvement in recognition from practice, the reverse effects due to fatigue, or a combination of both) was not a factor to be dealt with in investigating the threshold differences between neutral and loaded words, a check was made on this point as a matter of information and interest.

The mean exposure time at correct recognition for all positions, without regard for the stimulus words in the positions, was calculated. These means are shown in Table 3.

TABLE 3
MEAN EXPOSURE TIME AT RECOGNITION FOR ALL
WORDS IN GIVEN SERIAL POSITIONS

Position	Mean Exposure Time
1	.178
2	.172
3	.173
4	.156
5	.155
6	.167
7	.160
8	.164

The mean of this distribution of position means was .166, and the standard deviation of the distribution was .0078. It can be seen that the largest deviation of a position mean (position 1) from the mean of the distribution is .012, which is 1.54 standard deviations. Thus there is no evidence to suggest that the distribution of sample means are not a random sample from the same population. The value of chi square for this distribution is 8.53, which, with eight degrees of freedom,

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falls considerably short of significance at the .05 level, and does not warrant rejection of the hypothesis that there are no differences in exposure speed at recognition due to serial order.

Although construction of the stimulus words had been aimed at equating them for actual structural difficulty and complexity (all were six letters in length, two syllables, and none contained the same letter twice), it was felt to be worthwhile to test how close the experimenter had come to this goal. It still seemed possible that significant differences in intrinsic difficulty of the words might exist, independent of their emotional loading, even though efforts had been made to eliminate this.

The overall mean exposure time (under both loaded and neutral conditions) was calculated for each stimulus word. These means are shown in Table 4.

Frequency polygons of exposure times at correct recognition, for each word, were constructed, and these distributions were seen to depart considerably from normal (see Figures III through X).

Sign tests were made between six pairs of words having the greatest differences between means. The results of these sign tests are shown in Table 5.

Although none of the differences are significant at the .05 level, some of the significance levels are high enough

TABLE 4
OVERALL MEAN EXPOSURE TIME FOR STIMULUS
WORDS AT POINT OF RECOGNITION

Word	Mean Exposure Time
BURKOL	.168
ELVNAS	.186
AMTRUP	.165
WERDAN	.183
RELDAX	.164
LYNGIP	.156
VALNIT	.154
HILPAR	.156

TABLE 5
TESTS OF DIFFERENCES BETWEEN MEAN EXPOSURE TIMES
OF WORDS HAVING GREATEST MEAN DIFFERENCES
(Corrected for continuity)

Words	Expected +	Observed +	z	Significance Level
ELVNAS-VALNIT	23	29.5	1.917	.06
ELVNAS-HILPAR	23	26.5	1.032	.30
ELVNAS-LYNGIP	23	28.5	1.620	.11
WERDAN-VALNIT	23	28.5	1.620	.11
WERDAN-HILPAR	23	28.5	1.620	.11
WERDAN-LYNGIP	23	27.5	1.327	.19

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to suggest that some of the words were slightly more difficult to recognize than others, regardless of their emotional loading. This difference in difficulty can probably be attributed to the structural complexity of the words and/or the structural differences in the component letters.

As a final check on the effects of the emotional loading of stimuli on visual recognition thresholds, a comparison was made between the thresholds of the two groups of experimental subjects. Since the stimulus words that were loaded for group A were neutral for group B, and the words that were loaded for group B were neutral for group A, this comparison of the two groups gave, in effect, a measure of the effects of two different conditions (loaded and neutral conditions) on recognition thresholds for the same words.

The mean exposure time at correct recognition for loaded words (BURKOL, ELVNAS, AMTRUP, and WERDAN) for group A was found to be .205 seconds. The mean for neutral words (same four words as above) for group B was .146 seconds. The difference between these means was .059 seconds. The value of t (for small independent samples) was 2.60, showing this difference between means to be significant at the .05 level, and to fall just short of significance at the .01 level of confidence.

The mean exposure time at correct recognition for loaded words (RELDAX, LYGIP, VALNIT, and HILPAR) for group B was

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found **to** be .154 seconds. The mean for neutral words (same four **words** as above) for group A was .157 seconds. No **t** test **was** applied to the difference between these means, as it was **o**bviously far short of significance.

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Figure I

DISTRIBUTION OF MEAN EXPOSURE TIMES FOR LOADED WORDS

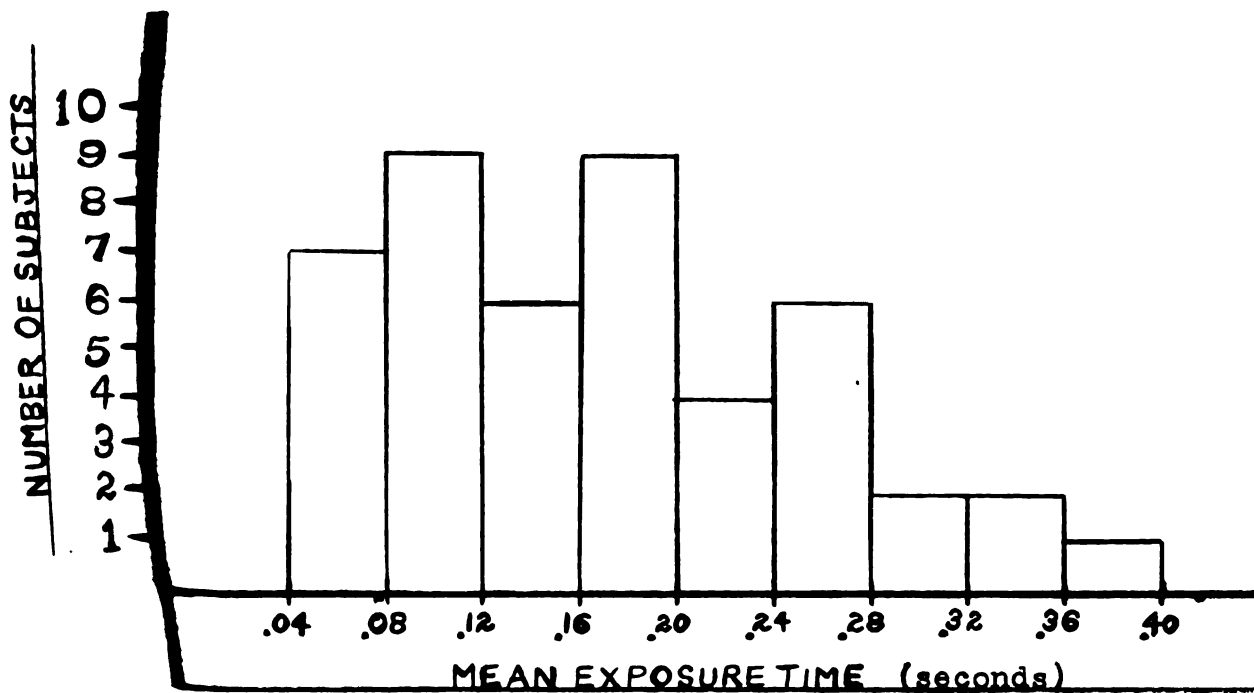
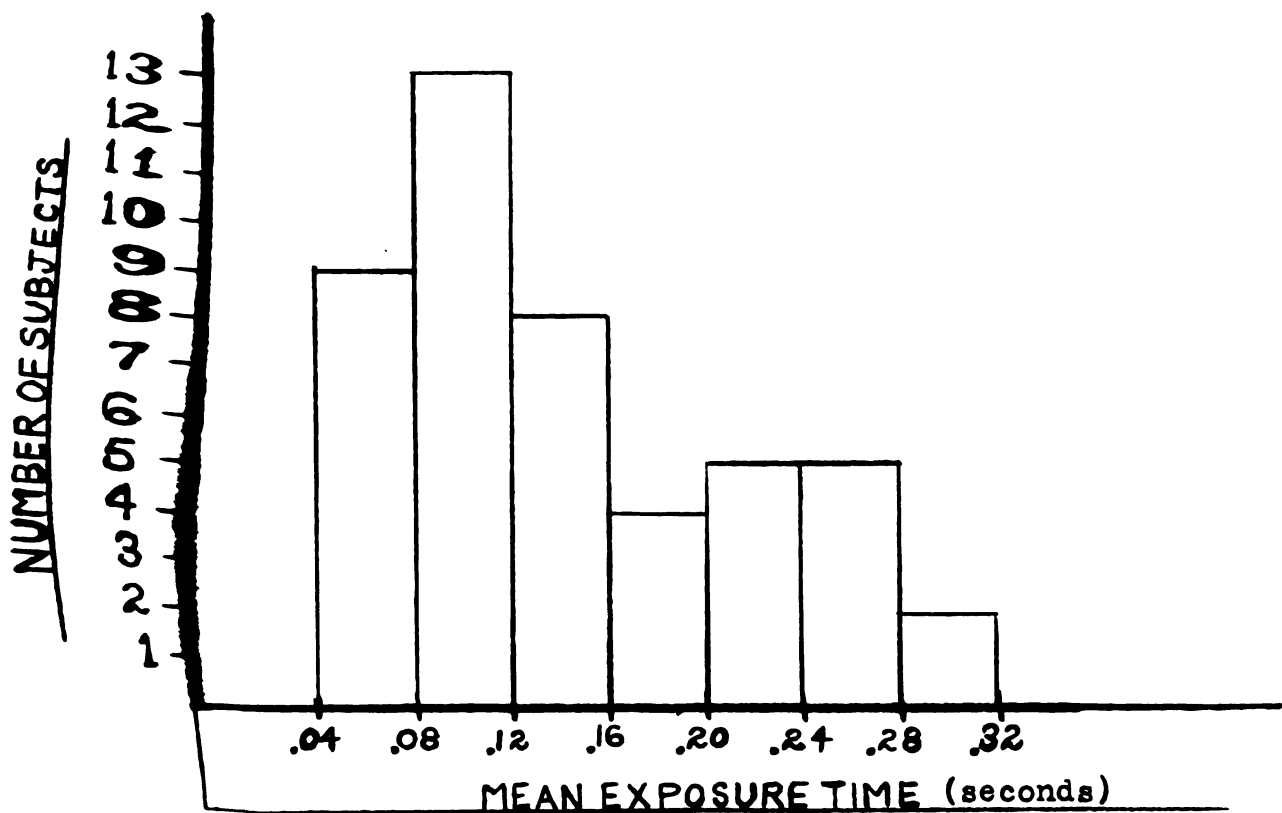


Figure II

DISTRIBUTION OF MEAN EXPOSURE TIMES FOR NEUTRAL WORDS



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Figure III

DISTRIBUTION OF EXPOSURE
TIMES FOR
BURKOL

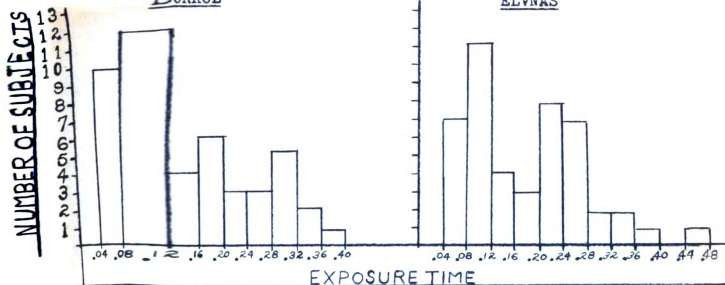


Figure IV

DISTRIBUTION OF EXPOSURE
TIMES FOR
ELVNAS

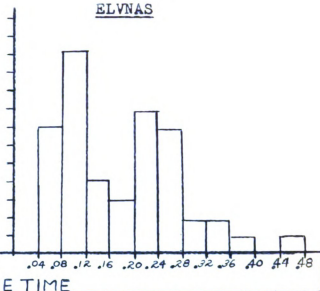


Figure V

DISTRIBUTION OF EXPOSURE
TIMES FOR
RELDAX

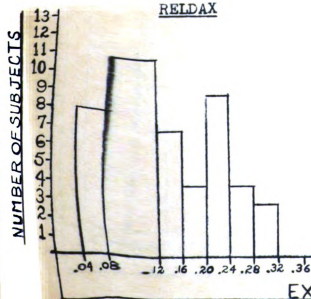


Figure VI

DISTRIBUTION OF EXPOSURE
TIMES FOR
LYNGIP

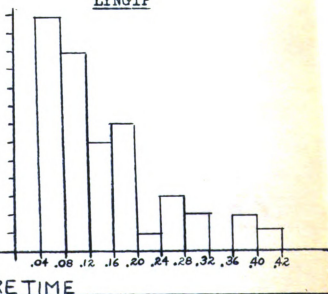


Figure VII

DISTRIBUTION OF EXPOSURE
TIMES FOR

AMTRUP

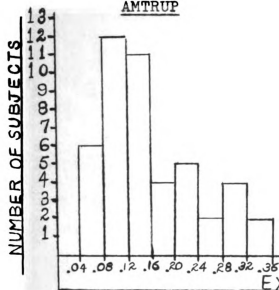


Figure VIII

DISTRIBUTION OF EXPOSURE
TIMES FOR

WERDAN

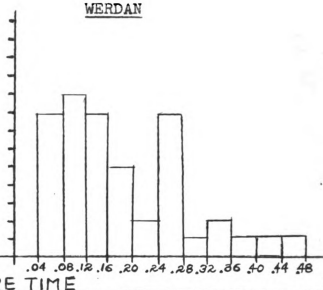


Figure IX

DISTRIBUTION OF EXPOSURE
TIMES FOR

VALNIT

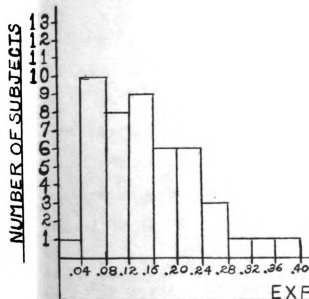
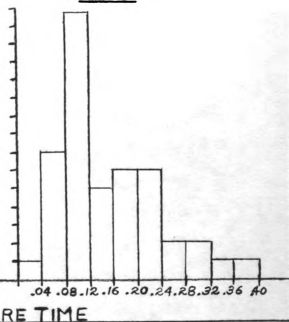


Figure X

DISTRIBUTION OF EXPOSURE
TIMES FOR

HILPAR



DISCUSSION OF RESULTS

The obtained results of this study seem to offer strong evidence in support of the dynamic conceptualization of the so-called perceptual defense phenomenon. The mean recognition threshold for experimentally loaded words was significantly higher than the mean for neutral words, when all 46 subjects were taken as a single group. The sign test revealed that the number of individuals having a higher mean recognition threshold for loaded words than for neutral words was significantly greater than chance would allow for.

Since the experiment was so designed that the stimuli were totally unfamiliar to the subjects to begin with, and all subjects had equal exposure to all stimuli during the conditioning process, it seems that the possibility that the differences in recognition thresholds could be due to differences in response availability has been reduced. The possibility that the differences in recognition thresholds reflect a conscious suppression of response due to fear of censure or embarrassment for responding with the loaded stimuli would also seem to have been eliminated, since all the stimuli were nonsense words. The use of the same words for both loaded and neutral stimuli avoided any possibility of the threshold differences being due to differences in intrinsic difficulty of the stimuli regardless of their

experimental loading. The random order of tachistoscopic presentation of the stimuli controlled for serial effects, practice effects, and fatigue effects.

There seems, therefore, to be only one remaining factor to which the differences in thresholds can reasonably be attributed; this factor is the emotional loading given to the stimuli in the conditioning process.

The question of whether the situations with which the stimulus words were experimentally associated (and thus also the experimentally loaded words) were disturbing or anxiety-producing to all subjects, was not, it must be admitted, directly or thoroughly dealt with in the experimental design. There was no assurance that incest, patricide or both were disturbing to any or all of the subjects. It seemed reasonable to assume, however, that these situations would be disturbing to the great majority of young males in our culture, since they are antisocial acts which violate the basic value systems of the culture. The stimulus words were imbedded in the acts and situations, and therefore it was assured that they were associated with them. In the case of "dirty words," and anatomical words used in most previous experiments, there is no assurance that these words have been associated in the experience of any given subject, with acts or situations which are emotionally disturbing. Sexual words and/or anatomical words may for instance, be associated, in any given person, with normal, heterosexual relations, and not with incest, homosexuality, or



perversion. In view of the above reasoning, it was felt that there was greater assurance that the loaded stimulus words used in this experiment were disturbing than there would be in a case where "dirty words" or anatomical terms were used.

If it is assumed, as appears to be justifiable, that the differences in recognition thresholds are due to the emotional loading of the stimuli, and since the thresholds for the loaded stimuli were higher than those for the neutral stimuli, it appears logical to conclude that the elevated recognition thresholds represent an attempt, on the part of the subjects to avoid the loaded stimuli. This avoidance behavior can easily be conceived of as a defense.

The actual defense process, the observable result of which is the elevation of the recognition threshold, can be conceptualized and explained in many different ways. The past literature offers us little, as theorizing in this area has been sketchy, and attempts to experimentally study the actual mechanics of the defense process -- the steps which the subject takes to avoid the loaded stimulus, and which result in the raised recognition threshold -- are non-existent. Many investigators in this area do not deal with theoretical formulations at all. Others (39) are content to fall back on the psychoanalytic framework, and speak of an unconscious "blocking" similar to repression, which prevents the subject from visually defining the stimulus. While this concept is certainly tenable, it is also true that there is no conclusive

evidence. Other theoretical interpretations of the observed phenomenon (the elevation of recognition thresholds for loaded words) are possible, and one such explanation will be offered in Part II of this study, along with experimental data that can be interpreted as supporting it.

In the course of the analysis of the obtained data, an incidental finding, which appears worthy of discussion and analysis, emerged. This finding deals with the importance of the variable of stimulus difficulty to the so-called perceptual defense phenomenon. To the knowledge of this experimenter, the variable of intrinsic difficulty of the stimuli has never been considered highly relevant. A thorough survey of the literature discloses little mention of this variable by previous investigators. The data obtained in this study suggests that relative difficulty of the stimuli, which can probably be attributed to differences in structural complexity of the whole or the component parts, and which is independent of the meaning or emotional loading, is probably highly relevant.

It can be seen from the data in Tables 1 and 2, that the elevation of recognition thresholds on experimentally loaded words was not universal. In this sample, 35 of the 46 subjects had higher mean recognition thresholds for loaded words than for neutral words. The 11 remaining subjects showed either the reverse effect, or no difference between neutral and loaded words. An inspection of the data in Tables 1 and 2 showed that

21 out of the 23 subjects in group A had higher mean thresholds for loaded words than for neutral words, while only 14 of the 23 subjects in group B had higher thresholds for the loaded words. It will also be noted from the data in Table 4 that some words elicit higher mean thresholds than others. When it is considered that those eliciting the highest thresholds (BURKOL, ELVNAS, AMTRUP, and WERDAN) are loaded for subjects in group A while those eliciting the lowest thresholds (RELDAX, LYNGIP, VALNIT, and HILPAR) are neutral for subjects in group A, and that the conditions are reversed in group B, a suspicion is aroused that the perceptual defense effect might, after all, be a function of the relative difficulty of the stimuli.

The comparison of the two experimental groups shows that the intrinsic difficulty of the stimuli is, indeed, a variable highly relevant to the perceptual defense phenomenon, but that the observed higher thresholds for loaded words in this study cannot be attributed to this. The mean of the thresholds elicited by the most difficult words when these words were loaded, was seen to be significantly higher than the mean of the thresholds for these words when they were neutral. The mean of the thresholds for the least difficult words when these words were loaded was found not to differ significantly from the mean of the thresholds for these words when they were neutral.

Further inspection of the data in Tables 1 and 2 reveals that the subjects in Group B appear to be better at the

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recognition task than the subjects in Group A. The overall mean exposure time for Group B was .150 seconds, while the overall mean for Group A was .181 seconds.

Thus, if Group B was composed of faster "recognizers," and these subjects were presented with neutral words of greater intrinsic difficulty than the loaded words, it is surprising that even 14 out of 23 of them showed the "perceptual defense" phenomenon. It seems highly probable that if these subjects had been presented with loaded words that were equal in difficulty to the neutral words, a much greater number of them would have shown higher thresholds for loaded than for neutral words.

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PART II

INTRODUCTION

Although most investigators in this area agree that subjects tend to respond with higher recognition thresholds to stimuli that can be conceived of as ego-threatening, attempts at a theoretical explanation of the underlying process which produces the phenomenon of the raised threshold have been few and rather superficial. In fact, most investigators have been content to note that the phenomenon occurs, or to argue that it does not occur, and to make no attempt at conceptualization of the process involved, beyond postulating an unconscious "blocking".

In Part I of this study it was demonstrated that subjects do tend to have higher recognition thresholds for disturbing or threatening stimuli than they do for neutral stimuli, when all known relevant variables are controlled. The data in Part I does not offer an explanation of the process resulting in this phenomenon however. Previous "perceptual defense" studies have dealt only with the phenomenon and the conditions and factors relevant to its elicitation, just as Part I of this study has done.

In Part II, an attempt will be made to carry the investigation an additional step forward. A possible theoretical conceptualization of the process underlying the raised thresholds

will be presented along with data that can be interpreted as supporting this theoretical conceptualization. This investigator will readily admit that other explanations, using different constructs, are possible. The one presented here is simply one of many.

Some Theoretical Formulations

Postman and Bruner (40) have stated that perception must be viewed as goal directed behaviour. The goal of perception, they say, is the construction of a behavioral environment meaningful to the individual -- an environment congruent with reality on one hand, and the needs and disposition of the individual on the other. Postman and Bruner have consistently treated perceptual defense in the dynamic context, and therefore, stress the importance of needs, attitudes, and values signified by the stimulus words. They state that, in order to achieve meaning, the individual must select his percepts from a multitude of potential stimulus configurations, emphasize them, and make them stable and coherent in the face of continuing sensory flux. The individual thus strikes a balance between the requirements created by physical, biological, and social existence. He learns to eliminate from his perceptual field that which is extraneous to him, and to encompass what is important. In this sense, perception is the first line of defense against would-be catastrophic situations and a sensitizer to adaptive opportunities.

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McGinnies (36) is more specific in his theorizing. He believes that perceptual defense is based on conditioned avoidance, and is designed to delay the greater anxiety that accompanies actual recognition of a stimulus to which a conditioned avoidance response has been established. He hypothesizes that certain features of the stimulus, which the subject does not consciously perceive, are physically affecting his body, and these internal events are in turn affecting his appraisal of the stimulus.

In a later statement of theory, McGinnies and Sherman (38) hypothesize that verbal responses involving "taboo" symbols have, in most persons, been punished by parents or others in the course of acquiring language skills. These symbols thus become secondary negative reinforcing agents. The threshold for anxiety may be lower than the threshold for total recognition of the "taboo" symbol, and certain pre-recognition cues may initiate autonomic responses which in turn initiate the perceptual defense reaction aimed at avoidance of the stimulus. The avoidance response, by preventing occurrence (perception) of the punishing stimulus, would reduce anxiety and thereby be reinforced.

Eriksen (16) offers a slightly different slant when he states that a possible explanation can be offered in terms of the effects of anxiety on problem solving. A perceptual recognition task can be viewed as a problem solving situation, and if anxiety interferes with availability and flexibility of



hypotheses, then stimuli that provoke anxiety may require more cues (longer exposure time) before correct recognition occurs.

A very recent approach is to view the so-called perceptual defense phenomenon as a statistical artifact. Howes (26) presented a statistical interpretation of the subception concept advanced by Lazarus and McCleary (32). He theorized that at any specific moment the reactions accompanying an observer's report is proportional to the probability that that report will be emotionally loaded (in the Lazarus and McCleary study, the "loading" was accomplished by electric shock).

Eriksen (17) also criticizes the subception concept, and states that invoking such a process to explain differing recognition times is unjustified unless it is demonstrated that the number of verbal responses available to the subject is sufficient to reflect all the discrimination that he is capable of making. The effect, in the case of the Lazarus and McCleary study can be formulated as a partial correlation between the reaction (GSR) and the stimulus, with the verbal response held constant, he says.

It can be seen that most of the above conceptualizations, incomplete as they are, are treating the raised recognition threshold as a defense mechanism. The needs and attitudes of the subject are included, and the raised threshold seems to be visualized as a means of protecting the individual against anxiety that would arise from contact with stimuli antithetical to these needs and attitudes. It also appears, however, that



the defense mechanism is being viewed as an unconscious, rather mechanistic process that is operating mainly on a physiological level. This is particularly true of the conceptualization advanced by McGinnies (36), and McGinnies and Sherman (38). In these formulations, the individual appears to play little part in the process, but is more like a puppet who is controlled by unconscious physiological events. No room seems to be given to insight, inference, or the conscious participation of the individual in his own defense.

A more parsimonious explanation of the process resulting in the raised recognition threshold seems possible -- an explanation that takes into consideration the active efforts of the individual. This theoretical explanation will now be presented, along with experimental data which can be interpreted as offering some support for it.

A Broadened Scope for Defense Mechanisms

In the majority of theoretical formulations, defense mechanisms are conceived of as operating largely at an unconscious level. This is certainly true of the orthodox psychoanalytic viewpoint as expressed by Anna Freud (20). Although it is seldom explicitly stated, it is usually implied in the majority of theoretical discussions. Fenichel (18) implies that the mechanism of rationalization may be employed on a more nearly conscious level than the other mechanisms --

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perhaps on a subconscious level, but little theoretical use is made of this implication.

The concept of the differing degrees of primitiveness of the various defense mechanisms as discussed by Fenichel (18), can be conceived of as paralleling a concept of differing levels of consciousness. He states that the various mechanisms (or their forerunners) make their appearance at differing stages of psychosexual development. One could conceive of the mechanisms developed at the earlier stages of psychosexual development, which Fenichel considers more primitive and, incidentally, more pathological, as being those that operate at the deepest unconscious level, with those developing at later stages operating at a level closer to awareness. This line of thinking is not followed in his theoretical discussion however.

A departure from the traditional conceptualization of defense mechanisms, and a formulation which provides a much broader scope for them is advanced by Gilbert (21). According to this formulation, defense mechanisms operate on various levels of consciousness and embrace social learning as well as libidinal, intrapsychic phenomena. Therefore many more types of learned behavior, directed at protecting the individual from anxiety, can be termed true defense mechanisms than is possible if one holds the viewpoint that a true defense mechanism must operate at an unconscious libidinal level. According to Gilbert's formulation, many mechanisms, like Freudian repression, operate at an unconscious level, but there are in addition,

many mechanisms which operate on a level of partial awareness. These are to be distinguished from conscious, planned avoidance, as the individual is only partially aware that he is employing them. In this framework, many behavior patterns, which were formerly difficult to deal with due to their partially conscious and seemingly deliberate nature, can be easily integrated into psychodynamic explanations of behavior.

The Concept of Diversion of Insight

The concept of diversion of insight as a defense mechanism is introduced by Gilbert (21) in an entirely different context from the perceptual defense phenomenon. In an attempt to explain the bizarre and often contradictory behavior of the Nazi leaders with respect to the atrocities they perpetrated, he theorizes as follows:

Between knowledge and ignorance there is the limbo of arrested perceptions and inhibited insights. Between calculated hypocrisy and hysteria there is semi-conscious self-deception. It is possible to look at things without fully perceiving them, to divert one's attention from the unpleasant to the pleasant, from the ego-threatening to the ego-gratifying; to suspend the process of rational inference in mid-air, and to distort one's insights just enough to suppress anxiety.

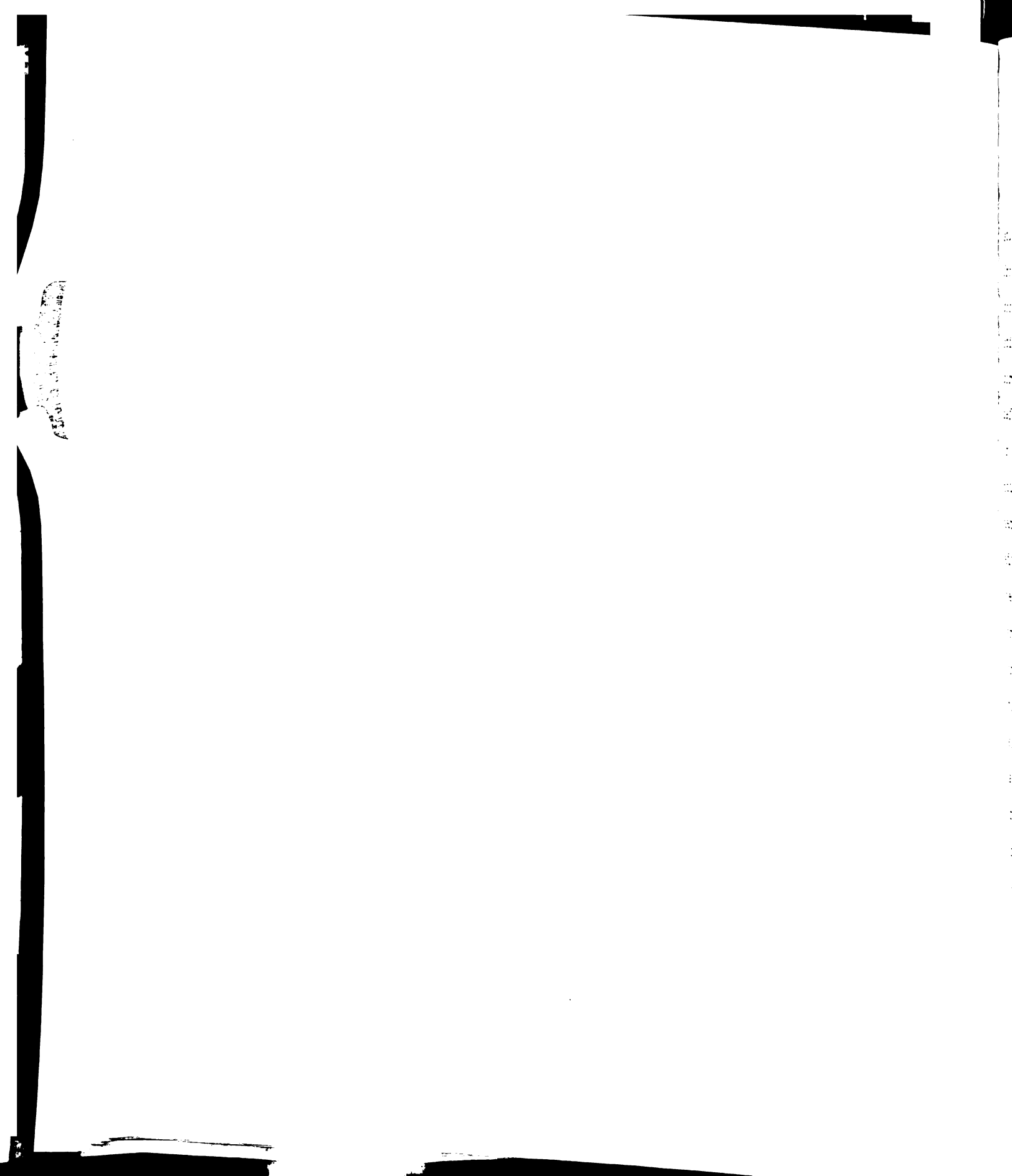
One of the ways in which this semi-conscious self-deception is accomplished, Gilbert states, is by use of the mechanism of diversion of insight. This, he goes on to say, is a mechanism by which anxiety is suppressed by diverting the attention and failing to draw the necessary effective inferences from relevant

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perceptual data. Anxiety that may be associated with perceptual data is still present when this mechanism is employed, but its overt signs are suppressed to a large degree. It may manifest itself in varying degrees, either at the focus or the periphery of awareness, but the circumstances that provoke it are not consciously related to the anxiety.

It would appear possible to apply the concept of diversion of insight as an explanation of the behavioral phenomena observed in the perceptual defense and subception studies. The following theoretical formulation is, therefore, tentatively advanced.

When an individual is faced with a stimulus, the conscious recognition or identification of which would cause him anxiety, he attempts to escape from, ignore, or suppress the full awareness of its implications, and thus prevent or alleviate the anxiety. This is accomplished in many different ways, depending on the situation, the individual, and the nature of the anxiety-arousing stimulus. In general, he can adopt one of two methods of meeting the situation so as to accomplish his purpose of avoiding or terminating the attendant anxiety; he can take physical action (running from, attacking, or destroying the anxiety-arousing stimulus object), or he can employ one of the psychological mechanisms of defense. If he elects, or is forced by external circumstances to choose the latter, he is, in effect, altering his perception of the stimulus, regardless of the mechanism he employs.



In the situation such as that provided in Part I of this study, the subject cannot take physical action. He cannot run from or destroy the stimulus object, since he has agreed to cooperate with the experimenter, and he cannot ignore the stimulus object, since his attention is constantly being directed to it. At the same time, his choice of psychological defense mechanisms is limited. Becoming hysterically blind or deaf to the stimulus, deaf to the instructions, or unconscious (fainting) would be an alternative available only to seriously disturbed subjects. It would appear that the most effective steps the subject could take in this situation after he had sufficient cues to warn him of the probable anxiety-arousing nature of the stimulus, would be to fail to fixate properly or steadily on the stimulus field, to allow his attention to wander for brief periods, or simply to fail to draw effective inferences from the perceptual cues that he has, and the additional ones he receives -- in effect, "to suspend the process of rational inference in mid-air." Such a diversion of recognition or insight would permit the subject to avoid the full measure of anxiety connected with the complete recognition of the stimulus until a point was reached where the stimulus became too strong and obvious and the mechanism was no longer effective. Some evidence for this can be found in a study done by Duffendack (10), in which he found that subjects required a greater number of cues for the recognition of taboo words than for neutral words. The result of such an

attempt at diversion of recognition (or insight) would be a raising of the threshold of recognition--either in the exposure time, illumination, or clarity necessary for correct recognition of the stimulus, depending on the experimental design being employed--the usual perceptual defense phenomenon. Even during the prerecognition period the subject might be expected to display signs of suppressed anxiety. He might feel slightly uneasy, and be partially aware of distaste for the situation and a desire to escape from it, and possibly be partially aware that he wasn't "doing his best." He would not be fully aware of the reason for his discomfort in, and dislike of, the situation (the stimulus words), nor would he be fully aware of the steps he was taking to obviate his "doing his best." Direct confrontation by a second person with all the elements of the situation might bring about a complete realization and admission of his behavior after the termination of the situation however.

It will be noted that this formulation does not differ drastically from the dynamic explanations that have been offered by others. The raised recognition thresholds, which are the observable phenomena, are still viewed as the end product of an attempt to defend the ego against anxiety that would be produced by recognition of stimuli which have become anxiety-producing through past learning. The difference between the present formulation and ones previously offered by

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other investigators, lies in the degree of awareness postulated for the defensive attempts, and the identification of the mechanics of the process by which the end result (the raising of the recognition threshold) is achieved. This formulation postulates that the process need not be an unconscious avoidance reaction operating at a largely physiological level by interference with the visual functions, thus slowing up the recognition of every element of the stimulus, but may be a mechanism of which the individual is partially aware, and which he employs to delay final recognition of the whole stimulus after a sufficient number of elements have been recognized to furnish him cues to the anxiety producing nature of the whole. In other words, he may know at some level less than absolute certainty, that he is being faced with an unpleasant or threatening stimulus, and then attempt to divert or suppress final insight (or recognition) because he does not wish to know its specific identity.



HYPOTHESES AND RATIONALE

The attempt to investigate the process underlying the raised recognition thresholds for loaded words observed in 35 of the experimental subjects in Part I, was guided by the following reasoning.

The distinguishing features of the process of diversion of insight as it is conceptualized by Gilbert (21), are a suspension or interruption of the ability to make logical and rational inferences from perceptual data, and the fact that the subject is partially aware, either of the threatening nature of the stimuli with which he is faced, or of the fact that he is trying to evade the stimulus, or both. This latter feature -- the partial awareness -- results in a generalized feeling of anxiety in the subject, but the anxiety is not consciously connected with the threatening stimulus. Gilbert goes on to state that, due to the semi-conscious nature of the process, the subject is sometimes able to realize what he has been doing and why he has been doing it, if he is questioned and confronted with the elements of the situation.

From this point it was further reasoned that any data indicating that the elevation in recognition thresholds for loaded words reflected a slowing up of the recognition process at a point when the subject had enough cues to give him a general idea of the possible threatening nature of the entire word,

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could be considered to be in line with the proposed diversion of insight hypothesis.

Demonstration that the subjects showing raised thresholds were aware of a feeling of general discomfort or anxiety during the tachistoscopic presentation of the stimulus words, or that they felt dislike for the words, were partially or wholly aware of the taboo associations of the loaded words, or were partially aware of attempting to avoid recognition of some of the words, could also be considered to be in line with the diversion of insight process as proposed by Gilbert. Elicitation of an admission of these feelings, from subjects showing raised thresholds, by a process of post-experimental questioning and progressive confrontation with the elements of the situation and their performance, could be considered as evidence of the semi-conscious quality of their defensive behavior.

On the basis of the foregoing reasoning, the following hypotheses were set up.

1. Inspection of the pre-recognition performance of subjects showing higher recognition thresholds for loaded than for neutral words, will reveal that they tend to progress toward recognition of neutral and loaded words at the same rate up to the point where they have identified four letters correctly. There will be no difference between the mean number of trials required to recognize four letters of the



loaded words, and the mean number of trials required to recognize four letters of the neutral words.

2. Inspection of the pre-recognition performance of subjects showing higher recognition thresholds for loaded than for neutral words, will reveal that those subjects required more trials for the recognition of loaded words, after they had correctly identified four of the six letters comprising the word, than they did for the recognition of neutral words after they had identified a like number of letters in those words.
3. In response to post-experimental questioning, subjects showing higher thresholds for loaded than for neutral words will indicate that they were aware of general uneasiness or anxiety during the experiment, a feeling of dislike for some of the words, the taboo association of some of the words, and/or an attempt or desire to avoid recognizing some of the words. They will indicate that they were either aware of this during the experimental procedure or realized it afterward during the interview. They will indicate that they did not consciously and deliberately plan to avoid the loaded words because they

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were loaded, or to deceive themselves or the experimenter.

4. In response to post-experimental questioning, subjects not showing higher thresholds for loaded than for neutral words will indicate that they were unaware of uneasiness or general anxiety during the experiment, any feeling of dislike for the stimulus words, the taboo associations of some of the words, or any attempt or desire to avoid recognizing some of the words. They will indicate that they were neither aware of this during the experimental procedure, nor during the interview.

Data in support of hypotheses 1 and 2 could, it appeared, be interpreted as lending support to the proposed conceptualization of the process underlying the raised recognition thresholds observed in Part I of this study. This behavior - recognition of the separate letters of all words at an equal rate until four of the six letters are identified, then much slower recognition of the remaining two letters of loaded words than of the remaining two letters of neutral words -- can be conceived of as the observable behavior that would occur if the ability to make rational and logical inferences from perceptual data were suddenly suspended at the point

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where enough data was available to the subject to give him a warning of the possible threatening nature of the word. The four-out-of-six-letters point is arbitrarily chosen. There is no definite evidence that this is the point where sufficient cues are available to the subject to warn him of the possible threatening nature of the whole word. It seemed, however, that the point at which slightly more than half of the elements had been identified, would be a logical point to begin looking for differences in behavior with respect to loaded and neutral words. Results supporting hypotheses 1 and 2 could, then be interpreted as the demonstration of behavior in line with one of the two distinguishing aspects of diversion of insight -- the interruption or suspension of the ability to make logical inferences from perceptual data.

Data in support of hypotheses 3 and 4, could, it seemed be interpreted as evidence of behavior in line with the second distinguishing aspect of the process of diversion of insight -- the partial awareness of marginal anxiety, and the partial insight into the elements of the threatening situation, and into one's own need to escape recognition of the threatening stimulus.

It is readily admitted that the question of the degree of consciousness or the degree of insight is not a simple one to solve. The fact that a subject, upon questioning, reports that he was conscious or aware of certain elements of a situation or of certain of his own feelings or motives,

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or that he had partial or total insight into his behavior, does not mean that this is a measure of the degree of consciousness or insight under which he was operating. Verbal report on such a matter can scarcely be considered an empirical datum. However, it seemed, in this instance, that if a difference in verbal reports could be demonstrated between the group of subjects showing raised thresholds on loaded words, and the group not showing this behavior, and if this difference was in the predicted direction, this finding could be conceived of as reflecting behavior in line with the proposed process of diversion of insight.

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PROCEDURE AND RESULTS

A Further Analysis of Data from Part I

The pre-recognition guesses of those subjects having higher mean thresholds for loaded than for neutral words were carefully analyzed, and the mean number of exposures required by each to identify four of the six letters (in their proper relative positions) of the loaded words was calculated. The same calculation was then made for the neutral words. The difference between the mean number of exposures required to recognize four of the letters of the loaded words, and the mean number required to recognize four of the letters of the neutral words was then calculated for each subject. This data is shown in Table 6.

The overall mean for loaded words was found to be 1.31 exposures, and the overall mean for neutral words 1.22 exposures. The difference between the means was .09 exposures. The value of t (for correlated samples), was 0.54, which falls far short of significance. Thus, it can be seen that the subjects in question identified four of the six letters of both loaded and neutral words in the same number of exposures.

As a next step, the mean number of exposures of both loaded and neutral words required by each subject to recognize and pronounce the entire word, after he had reached the point

TABLE 6

MEAN EXPOSURES OF STIMULUS WORDS REQUIRED FOR IDENTIFICATION
OF FOUR LETTERS IN PROPER ORDER

(Subjects having higher thresholds for loaded words)

Subject	Mean Exp. Loaded	Mean Exp. Neutral	D
A - 1	2.25	1.00	1.25
2	1.00	0.50	0.50
3	2.00	1.25	0.75
4	1.50	0.75	0.75
5	0.25	3.00	-2.75
6	0.75	0.25	0.50
7	1.00	0.50	0.50
8	1.25	0.25	1.00
9	0.50	0.50	0.00
10	0.25	0.50	-0.25
11	1.25	0.50	0.75
13	2.00	1.25	0.75
14	4.00	1.25	2.75
15	3.50	2.75	0.75
17	1.25	3.00	-1.75
18	1.00	0.00	1.00
19	1.25	1.25	0.00
20	1.50	2.00	-0.50
21	1.50	1.75	-0.25
22	0.75	1.50	-0.75
23	0.75	2.25	-1.50
B - 1	2.75	2.00	0.75
2	0.00	0.00	0.00
3	2.00	1.25	0.75
4	0.75	1.50	-0.75
5	1.50	0.50	1.00
6	2.00	2.00	0.00
7	1.50	1.25	0.25
9	0.50	0.50	0.00
10	0.50	1.25	-0.75
11	1.25	0.75	0.50
12	0.50	0.75	-0.25
14	0.00	1.75	-1.75
15	1.00	0.75	0.25
23	2.25	2.50	-0.25

TABLE 7

MEAN EXPOSURES OF STIMULUS WORDS REQUIRED FOR CORRECT
PRONUNCIATION AFTER FOUR LETTERS IN PROPER ORDER
HAD BEEN IDENTIFIED
(Subjects having higher thresholds for loaded words)

Subject	Mean Exp. Loaded	Mean Exp. Neutral	D
A - 1	3.75	1.75	2.00
2	2.25	1.75	0.50
3	2.25	2.25	0.00
4	3.50	1.50	2.00
5	6.00	1.00	5.00
6	1.50	0.00	1.50
7	10.00	2.50	7.50
8	1.25	0.75	0.50
9	2.75	0.75	2.00
10	3.75	1.00	2.75
11	3.50	1.50	2.00
13	6.25	2.75	3.50
14	3.75	2.50	1.25
15	2.50	1.25	1.25
17	6.25	5.25	1.00
18	0.50	1.75	-1.25
19	5.00	2.00	3.00
20	2.50	0.50	2.00
21	2.50	1.75	0.75
22	3.25	2.25	1.00
23	4.00	1.00	3.00
B - 1	6.25	2.00	4.25
2	1.00	0.50	0.50
3	4.75	1.75	3.00
4	1.50	0.25	1.25
5	1.50	2.50	-1.00
6	3.00	0.50	2.50
7	2.50	0.75	1.75
9	0.75	1.25	-0.50
10	2.50	1.75	0.75
11	4.00	1.00	3.00
12	2.00	1.25	0.75
14	4.00	1.25	2.75
15	3.50	0.75	2.75
23	3.00	2.50	0.50

where he was correctly identifying four of the six component letters in their proper order, was determined. This data is shown in Table 7.

The overall mean for loaded words was found to be 3.35 exposures, and the overall mean for neutral words 1.54 exposures. The difference between these means was 1.81 exposures. The value of t (for correlated samples) was 5.44, which is significant beyond the 0.01 level. Thus it can be seen that the subjects in question required a significantly larger number of trials to recognize loaded words after they had identified four of their six letters, than they did to recognize neutral words.

The Post-Experimental Interviews

Each of the 46 subjects serving in the experimental groups was brought back into the experimental room after completion of the procedure described in Part I of this study. The subjects were interviewed individually by the experimenter, who asked them a series of questions designed to determine the degree to which they were comfortable in the situation, were conscious of a distaste for or aversion to some of the stimulus words, or some of the stories in which the words had appeared, or were conscious of a distaste for the situation in general. The questions were also meant to determine the extent to which the subjects were conscious of a relationship

between the stimulus words seen in the tachistoscope and the names of the characters in the stories, and/or the extent to which they were conscious of a desire or attempt to avoid recognition of some of the words. The questions asked were the same for all subjects. The interview guide used by the experimenter is reproduced in the Appendix. A verbatim record of the subject's replies to each question was taken, and these records were later recopied to insure that they were completely legible.

For the analysis of the interviews, seven categories, each describing what was hoped to be a distinguishable step in the continuum of insight or awareness as pertaining to the experimental situation and the subject's feelings, and behavior, were devised. These categories were not intended as a scale, but merely as a means of indicating the degree of insight or awareness -- from complete unawareness to complete awareness and deliberate action -- governing the subject's behavior during the experiment. These categories are given below, along with their description.

Categories of Insight Reflected by Subject's

Answers to Interview Questions

- I. Total lack of awareness or insight -- Denial of any uneasiness, anxiety, or awareness of conflict or blocking in the experimental situation. Denial of any knowledge of a connection between words and stories, or between the nature

of the stimuli and his performance.

- II. Unstructured, partial awareness -- Admission of vague feelings of uneasiness or anxiety somewhere in connection with the experiment, but without focus or reason.
- III. Partial awareness -- Admission of the recognition that some of the words or stories were more unpleasant than others.
- IV. Partially structured awareness -- Recognizing the taboo nature of some of the words; that is, that the words in the tachistoscope and the pictures and stories were related.
- V. Partial insight -- Realizing that blocking on some of the words was due to III or IV (above), or both.
- VI. Complete post-experimental insight -- Full recognition and verbalization of the fact that he had attempted to avoid taboo stimuli because of their taboo associations -- this realization having occurred only after the experiment was over and during the course of the interview.
- VII. Complete immediate insight and deliberate action -- Recognizing taboo stimuli as such as soon as they were presented in the tachistoscope, and being fully aware that he was behaving differentially toward them.

Admission of a degree of awareness or insight such as that described in categories II through VI would be expected from subjects employing the process of diversion of insight,

according to the theoretical conceptualization of this process. Admissions of the degrees of awareness or insight described in categories I and VII would not be in line with the diversion of insight process as it is here conceptualized.

The experimenter then assigned each of the 46 subjects to one of the seven categories listed above on the basis of his replies to the interview questions. In categorizing the subject, the experimenter attempted to consider only the actual verbal report of the subject, and to refrain from making interpretations or inferences. The verbal reports were taken at their face value.

An advanced graduate student in clinical psychology was next asked to judge the 46 subjects on the basis of their interviews. He was given a brief outline of the experiment, and a typed list of the seven categories as listed above, but without the descriptive titles of the categories. He was instructed to place each of the subjects in one of the seven categories, on the basis of the subject's verbal report, and to refrain from making inferences or interpretations. He was not told which of the 46 subjects had shown an increased recognition threshold on loaded words.

In an attempt to control for the tendency of judges to group their judgments at a midpoint and avoid the ends of a continuum, the services of a third judge were enlisted with the following procedure. This judge, another graduate student

in clinical psychology, was given the same directions and brief outline of the study as the second judge. The list of categories which she was given were in different order and were assigned different numbers from those in the list used by the experimenter and judge number two. She was asked not only to judge the subjects from their verbatim report, but to arrange the seven categories in order, from that one denoting the smallest degree of insight and awareness, to that one denoting the largest degree of insight and awareness. This third judge, like the second, had no knowledge of which subjects had shown increased thresholds for loaded words. After she had made her judgments, they were translated to the numerical designations used by the experimenter and the second judge -- the numerical designations used above in listing the categories.

The category in which each judge placed each of the 35 subjects showing raised thresholds for neutral words, is shown in Table 8. The judgments of the 11 subjects not having raised thresholds for loaded words are shown in Table 9.

The order in which the third judge arranged the categories was identical to the order in which they were first devised, indicating that the categories as first devised were identifiable steps in a continuous scale.

Product moment correlations were computed between the judgments of all three judges. These correlations are shown in Table 10.

TABLE 8
 CATEGORY OF INSIGHT OR AWARENESS IN WHICH EACH SUBJECT
 HAVING RAISED THRESHOLDS FOR LOADED WORDS WAS
 PLACED BY JUDGES

Subject	Categorization		
	Experimenter	Judge 2	Judge 3
A - 1	IV	II	IV
2	II	II	I
3	IV	IV	IV
4	I	I	I
5	II	I	II
6	V	IV	IV
7	IV	IV	IV
8	V	IV	V
9	IV	V	V
10	IV	IV	IV
11	II	II	II
13	II	II	II
14	II	II	III
15	I	I	I
17	II	II	II
18	IV	IV	IV
19	II	II	II
20	III	III	III
21	V	IV	V
22	V	V	V
23	III	III	III
B - 1	IV	IV	IV
2	I	I	I
3	II	II	II
4	V	IV	IV
5	VI	VI	VI
6	IV	IV	IV
7	IV	IV	IV
9	IV	III	III
10	V	V	V
11	VI	III	V
12	IV	IV	IV
14	I	I	I
15	V	V	V
23	IV	III	III

TABLE 9

CATEGORY OF INSIGHT OR AWARENESS IN WHICH EACH SUBJECT NOT
HAVING RAISED THRESHOLDS FOR LOADED WORDS
WAS PLACED BY JUDGES

Subject	Categorization		
	Experimenter	Judge 2	Judge 3
A - 12	II	II	II
16	I	I	I
B - 8	IV	IV	IV
13	I	I	I
16	I	I	I
17	I	I	I
18	I	II	I
19	I	I	I
20	II	II	I
21	II	II	II
22	I	I	I

TABLE 10

FREQUENCY OF ASSIGNMENT OF EACH CATEGORY BY ALL JUDGES

	Categories						
	I	II	III	IV	V	VI	VII
Subjects having raised thresholds for loaded words	14	22	12	35	18	4	0
Subjects not having raised thresholds for loaded words	21	9	0	3	0	0	0

TABLE 11
CORRELATIONS BETWEEN JUDGES' CATEGORIZATIONS
OF SUBJECTS ON THE BASIS OF THEIR RESPONSES
DURING POST-EXPERIMENTAL INTERVIEWS

Judges	r
Experimenter - Judge 2	+.91
Experimenter - Judge 3	+.96
Judge 2 - Judge 3	+.93

The correlations in Table 10 indicate that the judges reached a high degree of agreement in their judgments of the degree of insight and awareness verbalized by the subjects.

Analysis of Table 8 reveals that 87 percent of the judgments made of subjects who had displayed raised recognition thresholds on loaded words, placed them in categories II through VI - the categories describing degrees of insight and awareness consonant with those hypothesized for the process of diversion of insight. Analysis of Table 9 reveals that only 36 percent of the judgments made of subjects who did not display raised recognition thresholds, placed them in categories II through VI, while 64 percent of the judgments placed them in categories I and VII. -- the categories describing degrees of insight and awareness not consonant with the process of diversion of insight. The significance of the

difference between these percentages was tested, and t was found to be 5.69, which is significant beyond the .01 level of confidence.

DISCUSSION OF RESULTS

The foregoing results show that the experimental subjects who have a higher recognition threshold for loaded than for neutral words, progress toward identification of loaded and neutral words at the same rate until they reach a point where they have identified four of the six component letters of the words. At this point, progress toward recognition of a loaded word diverges sharply from progress toward recognition of a neutral word, and the subject requires twice as many exposures to complete his recognition of a loaded word than he does to complete his recognition of a neutral word.

If one assumes that when the subject has identified four of the six letters, he has reached a point where he has sufficient cues to become partially aware of the probable nature of the word, it is possible to interpret this behavior as identical to that which should be observed if the process of diversion of insight were being employed. It is possible to say that this is the behavior that would be expected if a semi-conscious avoidance reaction was occurring at the point where the subject has enough cues about the nature of the loaded word to sense that it would be threatening to continue further with the recognition process.

In the case of the neutral word, the partially recognized stimulus is not associated with threat, and does not give warning of impending strong anxiety. It can be hypothesized

that the subject therefore can, and does, make a logical inference about the entire word with only a minimum of additional cues. He can proceed to recognition of the whole word on the next one or two exposures. In the case of the loaded word however, the partially recognized stimulus has furnished a semi-conscious warning of impending threat associated with the whole word. The subject then requires many more exposures to recognize the whole word. It can be hypothesized that he attempts to avoid or delay recognition of the whole word (and thus to avoid the dimly sensed threat), by failing to use additional perceptual data to make a logical inference about the whole word. In the words of Gilbert (21), he seems "to suspend the process of rational inference in mid-air," and to either distort or misuse additional perceptual data just enough to delay recognition of the word. The gain for the subject is, of course, easy to see. By delaying total recognition of the word, he delays final confirmation of its threatening nature, and the attendant increase in anxiety that would accompany it.

The above reasoning shows how the observed blocking at the four-letters-correct-point can be viewed as a semi-conscious avoidance through suspension of the ability to make logical inferences from perceptual cues -- one of the distinguishing features of the hypothetical process of diversion of insight. The formulation shows, however, only that the observed blocking can be viewed in this way. As it stands it is indeed inconclusive, and many other interpretations are equally possible.

To be sure, it is empirically established that the blocking takes place after four of the six letters are identified. This could easily be explained on the basis that the cues of the recognized four letters initiate an unconscious, autonomic response which interferes with the visual process. As has been stated previously, this explanation has been offered by McGinnies (36) and McGinnies and Sherman (38), and does not require the introduction of such concepts as inference, insight, and semi-conscious avoidance. To many clinicians, however, who have repeatedly observed that complex dynamics involving the active (though possibly distorted and misdirected) efforts of the individual usually seem to underlie observable behavior, such a simplified, mechanistic explanation might appear to be of little value in a practical sense.

The explanation advanced here, however, hints at a process that is not completely unconscious. Partial awareness, both of the threatening nature of the thing defended against, and of the fact that one is defending against it, is a necessary factor in the hypothetical process of diversion of insight which is here advanced as a possible explanation of the increase in recognition threshold for loaded stimuli.

The subjects' responses to the interview questions appear to offer evidence that the majority of those showing increased recognition thresholds for loaded words were operating with the degree of semi-conscious awareness or insight that is a necessary factor in the theoretical process of diversion of

insight. The fact that a majority of those subjects not showing the raised thresholds denied this semi-conscious awareness or insight, seems, further, to indicate that the awareness or the admission of it accompanies the subjects' attempt to defend against a threatening stimulus by delaying recognition of it.

The subjects' interview responses also indicate that those who responded to loaded words with raised recognition thresholds, were nearly all aware of some anxiety and discomfort. Their defensive attempt was apparently not successful in completely protecting them. This, too, would be expected if the diversion of insight hypothesis was an accurate formulation of the process underlying the raised thresholds. If the subject brings his defensive efforts to bear only after he has sufficient data to be partially aware of the probable threatening nature of the stimulus, he has already experienced some threat or anxiety. His defensive efforts would, then, be designed to ward off the much greater threat and anxiety that confirmation of his "guess" or partial insight would bring.

The ratings of the interviews show that a majority of the subjects showing raised thresholds realized, either during the experiment or during the post-experimental interview, that the words in the tachistoscope were related to the picture cards and stories. The few who realized this relationship during the tachistoscopic presentation recognized only a few of the words (invariably the neutral ones) as being connected

with the stories and cards. It would seem reasonable to expect that, once the subject had recognized that one or two of the words had been used as names for the characters in the cards, he would be "on the lookout" for others. Having these cues available, it would seem that he should be able to recognize most of the remaining words as also having been used in the stories and cards. The fact that the subjects failed to reach this conclusion could certainly be interpreted as additional evidence of arrested insight -- a suspension of the process of rational inference.

The mechanism of diversion of insight, which has been suggested as a possible explanation of the process underlying the increase in recognition threshold for loaded words demonstrated by 35 of the experimental subjects, consists of two necessary elements according to Gilbert's (21) formulation. These elements are the suspension or interruption of the ability to make rational inferences from perceptual data at the point where sufficient cues are available to give the individual a "hint" of the possible threatening nature of the stimulus, and the individual's partial awareness of this threat and his response to it. A third element which is an outgrowth of the first two, is generalized anxiety or discomfort of which the individual is aware, but which he does not usually associate with the threatening stimulus.

The data in this second part of the study indicate that a blocking occurs on loaded words after four of their letters

are identified, and that this blocking does not occur on neutral words. The interview material indicates that, in the opinion of the judges, most of the subjects showing the raised thresholds (and the blocking) indicate by their verbalizations that they are anxious or uncomfortable, are aware of a feeling of dislike for some of the words, are aware of the taboo nature of the words, or realize after the experiment that they tried to avoid some of the words. The interview material also indicates that, in the opinion of the judges, most of the subjects not showing the raised thresholds indicated by their verbalizations that they felt and behaved differently.

It is the author's contention that this data is in accord with the diversion of insight hypothesis, and that, while certainly not conclusive proof, it offers a measure of support for the hypothesis.

SUMMARY AND CONCLUSIONS

The results obtained in Part I of this study appear to offer strong support for the thesis that the "perceptual defense" phenomenon is a resultant of an attempt to defend against emotionally loaded stimuli. In view of the experimental design employed, it seems unlikely that the raised thresholds that were obtained could be attributed to factors suggested by other investigators. With the control of familiarity with the stimuli, practice and fatigue effects, the elimination of plausible reasons for the kind of conscious response suppression suggested by Hawes and Solomon (27), the control of relative intrinsic difficulty of the stimuli, and the utilization of the same words for both loaded and neutral stimuli, most of the criticisms of previous studies in this area seem to have been obviated. It is difficult to see how the raised thresholds for loaded words could be attributed to anything but the taboo meanings given the words in the conditioning process. The possibility, suggested by Hochberg, Haber, and Ryan (25), that the raised thresholds were the result of a "flinch" or startle response seems also to have been eliminated, since no physical punishment that would result in a flinch was employed in the conditioning.

It was suggested that the raising of recognition thresholds in response to loaded words was the observable behavioral result of a defense mechanism, and not of the mechanism itself. It was further suggested that the mechanism of diversion of insight as conceptualized by Gilbert (21) would result in raised thresholds for loaded stimuli in a visual recognition situation, and this hypothetical mechanism was offered as one possible way of conceptualizing the process underlying the phenomena observed in Part I of this study.

According to Gilbert's formulation (21), the mechanism of diversion of insight is characterized by two major elements. These elements are the suspension or interruption of the ability to make rational inferences from perceptual data at the point where sufficient cues are available to give the individual a "hint" of the possible threat contained in the stimulus with which he is faced, and the individual's partial awareness of this threat and of his response to it. A third identifying element, an outgrowth of the first two, is a generalized anxiety of which the individual is aware, but which he may not associate with the threatening stimulus. Part II of the study was concerned with an attempt to determine if these elements could be detected in the behavior of the experimental subjects.

An analysis of the pre-recognition responses of the subjects showed that subjects with raised recognition thresholds for loaded words proceeded with the recognition of the loaded

and neutral stimulus words with equal ease and rapidity, up to a point where they had identified a majority of the clues (letters) to the pronunciation of the words. Beyond this point the subjects were seen to require twice the number of additional exposures to recognize loaded words, that they required to recognize neutral words.

It was further observed in Part II, that in post-experimental interviews, most of the subjects who show a raised recognition threshold for loaded words report that they are aware of discomfort and anxiety during the experiment. They also report that they are aware -- either during the experiment or during the interview -- of the taboo associations of some of the words, feelings of dislike for some of the words, and for a desire to avoid recognizing some of the words. The majority of subjects who do not show raised recognition thresholds were found to deny that they were aware of anxiety or discomfort, the taboo associations of some of the words, dislike for any of the words, or a need to avoid recognition.

These observations in Part II were interpreted as offering support for the proposal that the process which had resulted in the raised thresholds could be identical to the mechanism of diversion of insight, although these observations could not be construed as proof.

Although a significant majority of the subjects in this study were seen to respond with higher thresholds for loaded than for neutral words, this behavior was not universal in the

sample. Eleven of the 46 subjects exhibited either a higher threshold for neutral words, or no differential response at all. A possible explanation for this appeared when a further analysis of the data revealed that a factor which might be termed "intrinsic difficulty of the stimulus" or "stimulus complexity" was a relevant variable, not previously recognized or considered by other investigators.

The obtained data seems to indicate that some of the stimulus words were more difficult to recognize than others, apart from their emotional loading. This is not a surprising discovery, as it is easy to observe in everyday experience that some figures are more difficult to visually define than others -- the more complex the figure, the more difficult it is to "see". It seems logical to assume that the difference in difficulty of the words, apart from their emotional loading, was due to differences in structural complexity in the component letters or in the combinations of letters.

The data also seems to indicate that subjects consistently show a raised recognition threshold for loaded stimuli only when that stimulus is sufficiently complex. It seems reasonable to assume that, as the complexity of the stimulus decreases, more and better cues are available and it becomes more obvious. The subject then finds it more difficult to avoid the stimulus by delaying recognition.

These findings can readily be assimilated and dealt with in the context of the mechanism of diversion of insight. The

subject employing this mechanism can only successfully employ it up to the point where the cues available to him become too numerous and too obvious. He is then forced to recognize the stimulus, since failure to do so would constitute a loss of contact with reality. It is easy to see then, that if the stimulus is so simple that numerous and obvious cues are rapidly available, the subject would quickly reach the point where he could no longer semi-consciously deceive himself by avoiding recognition. The diversion of insight mechanism would be very effective and easy to employ when the threatening stimuli were very complex. It would be quite ineffective and even impossible to employ when the threatening stimuli were very simple. In the latter case, the subject would probably find it easier and more beneficial to himself to employ an unconscious mechanism such as repression of the threatening or taboo associations of the stimulus. This would account for the behavior of the subjects in this study who failed to show raised recognition thresholds for loaded words. It will be remembered that these subjects denied feelings of anxiety, and any knowledge of the taboo associations of the words.

It is interesting to note here that Gilbert (21) first identified the mechanism of diversion of insight in connection with a very complex social situation, and postulated its employment in the avoidance of complex threatening stimuli.

Possibilities for future research are opened by these latter findings. The author would venture the hypothesis that

a replication of this study with more complex stimuli -- possibly longer words or even sentences -- would result in a larger percentage of the subjects showing increased visual recognition thresholds in response to loaded stimuli. Such a replication should also reveal much greater and more obvious differences of the kind found here, in responses to post-experimental questions, between subjects showing raised thresholds for loaded words, and those failing to do so.

Replication of this study using sentences as stimuli is an interesting possibility for a second reason. The use of sentences would permit the study of diversion of insight in the context of conflict of social roles or conflict of ideologies. Thus such a study would come far closer to reproducing the kind of situation in which diversion of insight was originally observed.

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APPENDIX I

STORIES USED WITH PICTURE CARDS IN CONDITIONING PROCEDURE

- Ia. Burkol and Elvna are brother and sister. Both are employed in responsible positions, and are respected members of the community. The front that they maintain is so good that no one suspects that Burkol and Elvna frequently have sexual intercourse with each other.
- Ib. Burkol and Elvna are brother and sister. Both are employed in responsible positions, and are respected members of the community. Burkol is planning to do some work on his car, while Elvna is waiting for friends who are stopping by for her.
- IIa. Reldax and Lyngip are brother and sister. Both are employed in responsible positions and are respected members of the community. The front that they maintain is so good that no one suspects that Reldax and Lyngip frequently have sexual intercourse with each other.
- IIb. Reldax and Lyngip are brother and sister. Both are employed in responsible positions, and are respected members of the community. Reldax is planning to go out for a round of golf, while Lyngip is waiting for friends who will take her on a picnic.

- IIIa. Amtrup is trying to convince his son, Werdan, that a proposed business venture is sound. These discussions are frequent between the two, as both have equal interest in the business. Werdan has always hated his father, and is becoming enraged. He will end the argument by stabbing Amtrup to death with a pocket knife.
- IIIb. Amtrup is trying to convince his son, Werdan, that a proposed business venture is sound. These discussions are frequent between the two, as both have equal interest in the business. Amtrup and Werdan usually work well together however, and a compromise is usually reached.
- IVa. Valnit is trying to convince his son, Hilpar, that a proposed business venture is sound. These discussions are frequent between the two, as both have equal interest in the business. Hilpar has always hated his father, and is becoming enraged. He will end the argument by stabbing Valnit to death with a pocket knife.
- IVb. Valnit is trying to convince his son, Hilpar, that a proposed business venture is sound. These discussions are frequent between the two, as both have equal interest in the business. Valnit and Hilpar usually work well together, however, and a compromise is usually reached.

APPENDIX II

POST-EXPERIMENTAL INTERVIEW GUIDE

Now that we've finished the procedure, I'm going to ask you some questions about it, and about your reactions to it. Your answers will have no effect on your class grades -- just the same as your performance during the experiment will have nothing to do with your grade. You'll only get credit for participating in the experiment. It's important that you be frank in your answers to these questions, because a large part of the experiment depends on it.

1. (a) Can you tell me, in general, how you felt while you were going through this procedure? What did you think of it?

(b) Were you: Nervous? Tense? Uneasy? Relaxed? At ease? Calm?

(c) Did you: perspire; feel cold; feel too warm; notice your heart beating faster than usual; have difficulty breathing; notice yourself breathing faster than usual; did your palms get damp; notice any trembling; feel like you wanted to laugh?
2. (a) Did you feel as though you'd like to get away from it -- get out of the room and get free of the process?

(b) Why? Did it have anything to do with the words in the tachistoscope?

(c) In what way? What was there about them that made you not want to look at them, or made you want to avoid them?

(d) Did you realize this at the time you were looking at them?
3. (a) Did you notice anything unpleasant about any of the words, or did you have a feeling that you didn't like them?

- (b) Do you think that some of the words were harder to see than others?
 - (c) Did their being hard to see have anything to do with their being unpleasant?
 - (d) Why do you think some of them were harder to see than others?
 - (e) Did you think of this while you were trying to see them?
 - (f) Did the difficulty of the words have anything to do with the pictures and stories you saw at the beginning of the experiment?
 - (g) In what way?
4. (a) Did you find it difficult to focus on the place where the word was to appear -- or did it seem that the location of the words changed from one exposure to another?
- (b) Did some of the words seem to make "less sense" than others?
 - (c) Did you notice yourself doing anything to keep from recognizing any of the words? Doing anything that would slow up recognition?
5. (a) Did you see, or do you see now, any connection between the stories you read at the beginning of the experiment and the nonsense words you tried to recognize?
- (b) Did this connection make any of the words distasteful to you, or have anything to do with your being able to recognize them quickly or being unable to recognize them at first?
6. (a) Some of the stories and pictures were about people involved in incest, and murder of their father, while others were about people in common, socially acceptable activities. The words you saw in the tachistoscope were the nonsense names of the people in the pictures and stories. Did you realize this?
- (b) Do you believe that you did anything to avoid recognizing the names of the people from the incest and murder stories?

- (c) Did you realize -- even partly -- that you were doing this?
 - (d) Did you, or do you now, know why?
7. (a) Having gone through the experiment and this interview, and knowing what you now know after all the clues I've given you, what is your idea as to the purpose of this experiment? What am I really trying to investigate?
8. (a) Now, I'm going to show you just what you did on the experiment, and explain the whole thing to you in detail. (Subject is shown the time scores of his performance -- the discrepancies between loaded and neutral words -- and the theory and procedure is briefly explained to him.) Now do you think that the fact that some of the words were connected to antisocial situations had anything to do with whether or not you could recognize them quickly, or with how you felt about the various words when you saw them in the tachistoscope?

ROOM USE ONLY

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