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THE EFFECTS OF ANXIETY PRODUCING STIMULI
ON VISUAL PERCEPTUAL THRESHOLDS:
A STUDY IN PERCEPTUAL DEFENSE

A Thesis
Presented to
the Faculty of the Graduate Division
Kansas State College of Pittsburg

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
David A. Johnson

July 1964

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ACKNOWLEDGMENTS

I wish to express my appreciation for the patient guidance and constructive criticism afforded me by Dr. Herbert Rumford, my adviser, and Mr. Kenneth Coffield. I also acknowledge the generous cooperation of Mr. Larry Karst who so ably assisted me with the experimental presentations. The advice and assistance of these persons was indispensable to the completion of this study.

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1978

ABSTRACT

The following is a summary of the results of the study.

1. The first part of the study was a review of the literature.

2. The second part of the study was a survey of the current state of the art.

3. The third part of the study was a comparison of the results of the survey with the results of the literature review.

4. The fourth part of the study was a discussion of the implications of the results.

5. The fifth part of the study was a conclusion.

6. The sixth part of the study was a bibliography.

ABSTRACT

The purpose of this investigation was to examine experimentally the phenomenon of perceptual defense as it is related to cigarette smoking behavior. In making this examination a population of undergraduate college students was divided into three groups according to their smoking habits. The three groups were identified as smokers, non-smokers, and quitters. A list of smoking related words was equated with a list of neutral words according to their frequency of appearance in print. These lists of words were then combined to form one list with a random distribution of smoking and neutral words, and this list was presented as stimuli to the subjects. The stimulus presentations were made by tachistoscopic projection, and the response thresholds were recorded in units of illumination of the stimulus required for correct identification.

The hypothesis that persons who had recently stopped smoking would exhibit the greatest degree of perceptual defense, followed in order by smokers and non-smokers was not supported by the results. Neither was there any significant evidence to support the prediction that perceptual defense would be positively correlated with anxiety as measured by selected scales of the MMPI. A post hoc investigation of the data did reveal that the smoking group contained a significantly greater proportion of persons

exhibiting perceptual defense than was found in either of the other groups.

It was recommended that additional research of this nature be conducted using a larger sample of older subjects, and incorporating more highly refined tachistoscopic equipment.

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CHAPTER I

INTRODUCTION TO THE PROBLEM

Statement of the Problem

The attempt to account for certain systematic variations in perceptual thresholds has been the subject of many psychological investigations. The concept of perceptual defense was one of several such constructs which have been introduced to account for this perceptual threshold variation.¹

The recent report on the harmful effects of cigarette smoking by the Surgeon General of the United States² has attracted no small amount of attention to the smoking behavior of the general population of this country. As a result of the unfavorable evidence against cigarette smoking presented in this report, many people have reportedly given up cigarette smoking, and many others have switched to cigar or pipe smoking.³ Other reports point to recent fluctuations

¹ Donald W. Mackinnon and William F. Dukes, "Repression," Psychology in the Making, Leo Postman, Editor (New York: Alfred A. Knopf, 1962), p. 712

² Smoking and Health: Report of the Advisory Committee to Surgeon General of Public Health Service (Washington: U.S. Govt. Printing Office), 1964.

³ "Smokers Slowdown: How Long Will It Last," U.S. News and World Report, LVI (Feb. 29, 1964), p. 6.

in the market value of tobacco stocks as a reflection of this reported change in the smoking habits of the American public.⁴

Although reports such as those cited above are tenuous at best, they did serve to attract the present writer's attention to the investigation of the effects of smoking habits on the perception of certain stimulus words.

The explanation of this reported change in smoking behavior appears simple and straightforward. It would seem to be a safe assumption that those who quit or switched did so because they were concerned over the possible hazard to their health represented by continued cigarette smoking. A second assumption that would seem to follow logically is that this concern would be accompanied by various degrees of anxiety associated with smoking behavior.

The author hypothesized that if these assumptions were correct, then smokers who did modify their smoking habits would demonstrate perceptual defense toward stimulus words related to smoking, and that persons who continued to smoke would be more threatened than non-smokers.

The problem of this research was to attempt to determine experimentally if persons classified as either smokers, non-smokers or "quitters" would exhibit different degrees of

⁴"It Won't Happen Here," Business Week, February 15, 1964, p.29.

perceptual defense toward smoking related verbal stimuli when these words were presented tachistoscopically together with an equal number of neutral words.

The specific hypothesis to be tested was that persons who had recently stopped smoking would exhibit more perceptual defense than would those who continued to smoke, and that non-smokers would exhibit less perceptual defense than either of the other groups.

An adjunct investigation of the study was to determine what correlation, if any, existed between the level of perceptual defense exhibited by the subject and his anxiety level, as measured by the Taylor Manifest Anxiety Scale⁵ and the Welsh A Scale⁶ of the Minnesota Multiphasic Personality Inventory.⁷ The hypothesis to be tested in this investigation was that there would be a positive correlation between perceptual defense and measured anxiety.

⁵ Janet A. Taylor, "A Personality Scale of Manifest Anxiety," Journal of Abnormal and Social Psychology (April, 1953 XLVIII:285-290).

⁶ W. G. Dahlstrom and George S. Welsh, An MMPI Handbook: A Guide to Use in Clinical Practice and Research (Minneapolis: The University of Minnesota Press, 1960), p. 294.

⁷ Starke R. Hathaway and J. Charnley McKinley, Minnesota Multiphasic Personality Inventory (New York: The Psychological Corporation, 1948).

Limitations of the Study

Since this study deals in part with unconscious processes, it is at once faced with several very formidable obstacles. This is an area which is difficult to assess with any great degree of accuracy. In a study of this scope it is not practical to determine beforehand to what degree the various stimulus words were anxiety producing, if at all. The fact that these words were selected on the assumption of their anxiety producing property rather than on an empirical measurement of this property should be considered in assessing the results of this experiment.

The researcher made no attempt to measure the conscious or unconscious motivational level of the subjects. The failure to control for this variable in no way denies the close relationship between motivation and perception.

The equipment available to the researcher was another limitation. Although the equipment was adequate to the experimental design and operated smoothly and efficiently, it is possible that a more precise tachistoscope would have permitted modifications in the experimental design which might have influenced the obtained results.

Another possible limitation of this research was the number of subjects used in the experiment. The age, educational level and socio-economic status of this sample must also be considered factors limiting the scope of this investigation.

It is possible that the use of a larger sample, composed of subjects ten to twenty years older than the students used in this study, would produce different results.

The tachistoscopic presentations of the stimulus words were made to groups of subjects rather than to individuals due to practical considerations of time. Although this experimenter does not consider this to be a serious limitation, the possibility of an individual presentation of the stimuli yielding different results should be recognized.

In spite of these limitations, it is believed that this study was sufficiently well controlled to test the hypothesis.

Definition of Terms

A tachistoscope is an instrument for providing a very brief timed exposure of visual material such as pictures, letters, or digits. The exposure may be regulated by a shutter, a falling screen or an interrupted illumination.⁸ Within this paper the noun tachistoscope or the adjective tachistoscopic will refer to a specially designed attachment for the conversion of a standard overhead projector to a

tachistoscope. This equipment will be described in detail in Chapter three.

Perceptual defense is a concept originally formulated by Bruner and Postman as follows:

The bulk of experimental and clinical evidence points to blockage as the process producing increase in association time to emotionally charged stimuli. Such blocking in association represents a defense against anxiety-laden stimuli. A basically similar process is at work in perception. With increase in emotionality of stimuli recognition may lead to anxiety and is to be avoided as long as possible.⁹

It is in this sense that the term perceptual defense will be used in this thesis.

Perceptual Threshold is defined operationally as the minimum intensity of visual stimulation (brightness of the projected image) required to correctly identify the tachistoscopically presented word or word pair.

Intelligence is defined operationally as that variable measured by the American Council on Education Psychological Examination for College Freshmen.

Minnesota Multiphasic Personality Inventory (MMPI):

A psychological test designed to provide an objective assessment of some of the major personality characteristics that affect personal and social adjustment. The test is available in both card and booklet forms. The booklet form which was

⁹J. S. Bruner and L. Postman, "Emotional Selectivity in Perception and Reaction," Journal of Personality (September, 1947), XVI, p. 74.

used in this experiment contains 550 self-report items which are answered true, false, or cannot say. The MMPI was developed in 1940 by S. R. Hathaway and J. C. McKinley of the University of Minnesota.¹⁰

Taylor Manifest Anxiety Scale (MAS): A special scale designed to measure the observable manifestations of anxiety. It is composed of fifty items selected from the MMPI. Many of these items are related to somatic symptoms from which anxiety is only inferred. The MAS was developed in 1953 by Janet A. Taylor.¹¹

Welsh A Scale: A special scale composed of thirty-nine items selected from the MMPI. This scale was devised in 1954 by A. S. Welsh to measure the factor of personal discomfort or distress which he labeled as anxiety. The A Scale appears to be strongly related to all indices of overt anxiety, and measures tension, nervousness, and distress in test subjects.¹²

Anxiety is defined operationally as that variable measured by both the Manifest Anxiety Scale and the Welsh A Scale

Hypochondriasis is a morbid concern about one's health,

¹⁰

Dahlstrom and Welsh, op. cit., pp. 3,8,11.

¹¹

Ibid., p. 294.

¹²

Ibid., p. 294.

with exaggeration of every trifling symptom.¹³

Galvanic Skin Response (GSR): the resistance of the skin to a weak electrical current as detected by a sensitive galvanometer.¹⁴

Perceptual Set: a readiness to perceive the environment in a certain way, generally in accord with some pattern.¹⁵ In this thesis perceptual defense is regarded as a negative set against perceiving what one wishes not to perceive.

Repression: the exclusion of specific psychological activities or contents from conscious awareness by a process of which the individual is not directly aware. Exclusion includes preventing entry into, forcing out of, or continuously preventing return to consciousness. One popular psychoanalytic definition implies that repression is a defense mechanism against anxiety or guilt.¹⁶ It is in this sense that it is used herein.

Suppression: a form of self control by which impulses or tendencies to action are kept from overt expression.¹⁷

¹³

Horace B. English and Ava C. English, A Comprehensive Dictionary of Psychological and Psychoanalytical Terms (New York: Longmans, Green, and Co., 1958), p. 245.

¹⁴

Ibid., p. 220.

¹⁵

Ibid., p. 496.

¹⁶

Ibid., p. 458.

¹⁷

Ibid., p. 536.

Inhibition: restraining or stopping a process from continuing, or preventing a process from starting, although the usual stimulus is present.¹⁸

Pragnanz: a basic law of Gestalt psychology which holds that a gestalt or configuration tends, to the extent that conditions permit, to become sharply defined or precise, stable, meaningful, and parsimonious.¹⁹

A Smoker is defined operationally as a person who currently smokes twenty or more cigarettes per day and who has smoked at this rate for a period of one year or more.

A Non-Smoker is defined operationally as a person who has smoked fewer than twenty cigarettes in his lifetime, and who does not currently smoke in any form.

A Quitter is defined operationally as a person who had been a regular cigarette smoker (twenty or more per day) for a period of at least one year, but who has given up cigarette smoking within the last year. Persons who have switched from cigarettes to a pipe or cigars are not included within this group.

Available Light is defined operationally as the level of light, exclusive of all artificial illumination, in the experimental room.

Method of Matched Pairs: an experimental procedure in

¹⁸Ibid., p. 262.

¹⁹Ibid., p. 402.

which the various characteristics and abilities of each person in one group are matched with those of an individual in the other group.²⁰ In this study this procedure was expanded to match trios rather than pairs.

Carbon Copy Technique: an experimental procedure for the measurement of recognition thresholds. The stimuli are presented to the subject as a series of progressively clearer carbon copies of the words. The graded clarity of the copy needed for correct recognition of the stimulus determines the threshold for that stimulus.²¹

²⁰

Ibid., p. 185.

²¹

M. Wiener, "Word Frequency or Motivation in Perceptual Defense," Journal of Abnormal and Social Psychology LI (September, 1955), pp. 214-18.

CHAPTER II

REVIEW OF THE LITERATURE

Theoretical Basis

The basis, in theory, for the concept of perceptual defense is closely related to the Freudian concept of repression. Freud himself has stated, "The essence of repression lies simply in the function of rejecting and keeping something out of consciousness."¹

The emphasis on the protective function of perception stressed in the perceptual defense experiments of the 1940's and 1950's and the related research which has followed these original studies might well be thought of as a contemporary revival of some Freudian views on perception.²

In Beyond the Pleasure Principle Freud states:

Protection against stimuli is an almost more important function for the living organism than reception of stimuli: the protective shield is supplied with its own store of energy and must above all endeavor to preserve the special modes of transformation, or energy operating in it against the effects threatened by the enormous energies at

¹Sigmund Freud, Repression, 1915, translated in J. Strachey (editor) The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. XVIII (London: Hogarth Press, Ltd., 1955), p. 27.

²Ibid., p. 713.

work in the external world.³

Although we have no guarantee that the perceptual defense constructs were an outgrowth of Freudian doctrine; we must concede that they are certainly consonant with psychoanalytic theory.⁴ Postman, Bruner and McGinnis make the following statement in their discussion of perceptual selectivity, "We suggest that a defense mechanism similar to repression operates in perceptual behavior."⁵

The McGinnies Experiment⁶

A special section of this chapter is devoted to the McGinnies study for three reasons: (1) the report of this experiment was the first article to be exclusively devoted to the thesis of purposeful failure to perceive,⁷ (2) it is the study most often cited in textbooks as a classic

³Sigmund Freud, Beyond the Pleasure Principle, 1920 translated in J. Strachey (editor) The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. XVIII (London: Hogarth Press, Ltd., 1955), p. 27.

⁴Mackinnon and Dukes, loc. cit.

⁵J. S. Bruner and L. Postman, "Emotional Selectivity in Perception and Reaction," Journal of Personality, XVI (September, 1947), p. 74.

⁶E. McGinnies, "Emotionality and Perceptual Defense," Psychological Review LVI (September, 1949), p. 250.

⁷Mackinnon and Dukes, op. cit., p. 733.

example of perceptual defense research (3) this study served as the basis upon which the present experiment was designed.

Using a tachistoscope, McGinnies presented a group of stimulus words to his subjects, male and female college students. Seven of the stimulus words were presumed to be emotionally toned-socially taboo words such as "whore", "penis", and "Kotex", while eleven of the words were neutral (e.g., "stove"). Using the method of limits technique each word was presented initially at a speed far above threshold, and on each subsequent trial the exposure time was increased until the word was correctly identified. As each exposure was made the galvanic skin response of the subject was observed and recorded.⁸

Upon examining the records of the GSR's of the subjects McGinnies found that the responses accompanying the taboo words indicated significantly less resistance than those accompanying the neutral words. He also found that the recognition thresholds as measured by the duration of the exposure were significantly greater for taboo words than for neutral words.⁹

⁸ McGinnies, op. cit., p. 244-51.

⁹ McGinnies, op. cit., p. 244-51.

McGinnies offered these findings as supporting evidence for selective repression at the perceptual level which he called perceptual defense. Within the conclusion of his report he states:

Perceptual defense apparently is based upon conditioned avoidance of unpleasant or dangerous stimulus objects. That the individual actually discriminates the stimulus before he fully perceives it is evident in his increased emotionality before recognition . . . Clearly the process of perceptual defense is designed to delay the greater anxiety that accompanies actual recognition of the stimulus.¹⁰

The Perceptual Defense Controversy

Since the concept of perceptual defense suggested by McGinnies was in opposition to most academic psychologists' description of human behavior, it received immediate criticism (Howes and Solomon 1950, Luchins, 1950). The idea of an experimentally demonstrable unconscious determiner of perception was especially distasteful to the associationists and the configurationists, as it threatened to replace their principles of perception with more dynamic ones such as repression.¹¹ As Mackinnon and Dukes state, "With the appearance of the McGinnies article the battle flags went up."¹²

¹⁰ Ibid., p. 249-50.

¹¹ Mackinnon and Dukes, op. cit., p. 715.

¹² Ibid., p. 715.

Since much of the perceptual defense literature was in the form of criticisms or represented the reports of experiments and counter-experiments designed either to deny or confirm the perceptual defense thesis; the writer feels it appropriate to report briefly some of the major criticisms and counter-experiments of this controversy, especially those directed toward McGinnies' 1949 experiment.

First to challenge the explanation of threshold differences in terms of perceptual defense were Howes and Solomon, who substituted the frequency hypothesis for perceptual defense.¹³ They argued that the taboo words were not so readily perceived due to the fact that they were less familiar to the subjects. After comparing McGinnies' threshold data with the Thorndike-Lorge frequency counts for the various stimulus words, they reported, "Our contention here is that McGinnies' taboo words might be expected to have far higher duration thresholds than his neutral words because the relative frequencies of the former are lower."¹⁴

The second criticism advanced by Howes and Solomon stated that due to the experimental conditions of the study, the subjects may not have been delayed in perceiving the taboo

¹³D. H. Howes and R. L. Solomon, "A Note on McGinnies' 'Emotionality and Perceptual Defense'", Psychological Review, LVII, (July, 1950), p. 229.

¹⁴Ibid., p. 230.

words, but only in reporting them. The delay attributed to defense may have actually been due to the embarrassment of the subject on having to verbally report the recognition of such words in the presence of the dignified professor and a young female assistant.¹⁵ The failure to provide for this control seems to the social psychologist a very obvious error. The differences in the GSR's could also be attributed to the social embarrassment of the situation.¹⁶

McGinnies in his rebuttal to the first of these criticisms objected that the literary sources used in the Thorndike Lorge word count did not provide a valid index of taboo words.¹⁷ He did, however, concede that frequency might well be an influencing variable which could not be discounted without further investigation.¹⁸

In a 1951 experiment Solomon and Howes determined frequency levels for words representing the several value areas

¹⁵
Ibid., p. 232.

¹⁶
Floyd Allport, Theories of Perception and the Concept of Structure (New York: John Wiley and Sons, Inc.), 1955, p. 332.

¹⁷
E. McGinnies, "Discussion of Howes' and Solomon's Note on 'Emotionality and Perceptual Defense'", Psychological Review (July, 1950) LVII, p. 229.

¹⁸
Ibid., p. 230.

of the Allport-Vernon Study of Values, and presented these tachistoscopically. Their findings indicated that frequency was far more important as a determiner of threshold time than was value rank.¹⁹ They concluded that although emotional factors operate in establishing word frequencies during an individuals development, there is no evidence to indicate that these factors operate independently of frequency in a tachistoscopic presentation.²⁰

Postman and Schneider challenged Solomon and Howes in an experiment in which they varied both frequency and value levels and examined these effects on word recognition and recall. On the basis of their findings, they concluded that the interaction of frequency and value is an important perceptual determiner and that value is most important in recall.²¹

In order to avoid the criticism that the Thorndike-Lorge word count was invalid, Solomon and Postman conducted a similar investigation using nonsense words with "built in"

¹⁹ R. L. Solomon and D. H. Howes, "Word Frequency, Personal Values, and Visual Duration Thresholds," Psychological Review, LVIII (July, 1951), p. 267.

²⁰ Ibid., p. 269.

²¹ L. Postman and B. H. Schneider, "Personal Values, Visual Recognition, and Recall," Psychological Review, LVIII (July, 1951), p. 283.

frequencies. As in the case of the Howes and Solomon study, frequency was found to be inversely related to recognition thresholds.²²

Upon examination of the studies supporting the frequency hypothesis, Lazarus concluded that "There is not much doubt that word frequency is a variable in perceptual recognition under certain conditions, but it is not a variable of such great importance and generality as has been suggested."²³

Another reviewer of the literature advancing the frequency hypothesis, C. W. Eriksen, cited findings from experiments dealing with success and failure, completion and incompleteness as indicating differences in recognition thresholds for words associated with these experiences. Referring to these experiments he challenged, "An explanation in terms of familiarity would be hard put to explain why subjects who recall completed tasks better than incompleteness have high recognition thresholds for words with long association

22

R. L. Solomon and L. Postman, "Frequency of Usage as a Determinant of Recognition Thresholds for Words," Journal of Experimental Psychology, XLIII (March, 1952), pp. 195-201.

23

R.S. Lazarus, "Is There a Mechanism of Perceptual Defense? A Reply to Postman, Bronson, and Gropper," Journal of Abnormal and Social Psychology, XLIX (July, 1954), p. 397.

times, while subjects who recall incompleting tasks do not."²⁴

Wiener challenged the Howes - Solomon hypothesis with a cleverly designed study. He employed four critical words which had both threatening and neutral meanings (e.g., "fairy") embedded in two long lists of words. One of the lists emphasized the neutral meaning, the other the "threat" meaning. The "threat" meaning referred to the meaning which was not socially acceptable.

Subjects' perceptual thresholds were scored according to which one of a series of progressively clearer carbon copies of the test words was sufficient for correct identification. Wiener found that those subjects who had been exposed to the "threat" list had significantly lower thresholds than did those who had had the neutral list.²⁵ He concluded that frequency alone cannot account for the difference, and that motivational factors are more important determinants.²⁶

An interesting study by Whittaker, Gilchrist and Fischer was designed to control for suppression (i.e. with-

24

C. W. Erikson, "The Case for Perceptual Defense," Psychological Review, LXI (May, 1954), p. 179.

25

M. Wiener, "Word Frequency or Motivation in Perceptual Defense," Journal of Abnormal and Social Psychology, LI (September, 1955), p. 214.

26

Ibid., p. 217.

holding the verbal report of perception). Words such as "nigger" and "darky" were administered for recognition thresholds sometimes by a Negro and sometimes by a white experimenter to a group of both Negro and white subjects. The experimenters reportedly obtained evidence of suppressed reports.²⁷

Cowen and Beier conducted a similar study in which they used both male and female experimenters to administer a word list containing sexually oriented words to both male and female subjects. In examining the recognition thresholds of these words the researchers reported no indication of inhibition of reports.²⁸

Another group of psychologists took issue with McGinnies' perceptual defense hypothesis, and attempted to explain the threshold differences in terms of set or a predisposition to organize stimuli in a certain fashion.²⁹

27

E. M. Whittaker, J.C. Gilchrist and J.W. Fischer, "Perceptual Defense or Response Suppression," Journal of Abnormal and Social Psychology, XLVII, (July, 1952), pp. 132-33.

28

E. L. Cowen and E. G. Beier, "Threat Expectancy, Word Frequencies and Perceptual Prerecognition Hypotheses," Journal of Abnormal and Social Psychology, XLIX (June, 1954), p. 178-82.

29

Donald W. Mackinnon and William F. Dukes, "Repression," Psychology in the Making, Leo Postman, editor, (New York: Alfred A. Knopf, 1962), p. 721.

Luchins, one of this group, offered the following:

If the concept of set can help to explain why selectivity for certain stimulus objects is enhanced, it can also help to explain why selectivity for other objects is lessened While a set may focus one on certain aspects of the stimulus field, it may blind him to others.³⁰

Postman was another who favored an explanation of variable thresholds in terms of set.³¹ He spoke of perceptual expectancies which he called perceptual hypotheses. He insisted that whatever was assumed to be the determiner of selective perception must be anchored in clearly definable antecedent conditions. He was attempting to relate hypothesis development to the well established laws of associative learning.³²

Erikson felt the use of set as an explanation for perceptual differences was inadequate, and in a criticism directed toward Luchins he stated, "The concept of set has shown itself in the history of psychology to be both broad and ambiguous enough to hide many important problems."³³

³⁰A. S. Luchins, "On an Approach to Social Perception," Journal of Personality, XIX (September, 1950), p. 76.

³¹L. Postman, "Toward a General Theory of Cognition," J. H. Rohrer and M. Sherib, editors, Social Psychology at the Crossroads (New York: Harper and Bros., 1951), pp. 242-72.

³²Mackinnon and Dukes, op. cit., p. 722.

³³Erikson, op. cit., p. 180.

The effect which McGinnies labeled perceptual defense has been interpreted in various ways. Apparently in an effort to be parsimonious, psychologists have explained the phenomenon in terms of set, Pragnanz, the dominance of strong alternative hypotheses, response suppression, and cue-drive theory.³⁴ But as Mackinnon and Dukes point out, "The principle of parsimony itself leaves room for equivocalities, and the questions 'What is simple?' and 'What is adequate?' are usually ultimately answered in terms of temperament rather than of logic."³⁵

Since the problem with which this research is concerned is not an explanation of perceptual defense, but rather to determine if it can be demonstrated in the case of stimulus words related to cigarette smoking, no attempt has been made to review these other various explanations.

The foregoing review has dealt with research in the area, endeavoring to consider the most important criticisms of these studies. In the present study the author has attempted to avoid as much as possible the weaknesses of some of the earlier research.

³⁴ Mackinnon and Dukes, op. cit., p. 733.

³⁵ Ibid.

Recent Research Developments

The vital interest in perceptual defense phenomena and their explanations which was so prevalent during the 1950's has recently been subsiding. This is not to say that there is no longer any interest in this area, as several articles appear in the journals each year.

The nature of the reported research has changed considerably, as can be expected after nearly fifteen years of investigation. Many of the studies recently reported are concerned with such factors as part-cues and response probability which are not closely related to the problem of this thesis. Several of the more recent studies have been reviewed in order to indicate the tenor of contemporary perceptual defense research.

Zucherman and Buss in a 1960 study on the interaction of various personality factors including anxiety and perceptual defense used the Taylor MA scale and the Welsh A scale in determining anxiety levels. Using the carbon copy technique, they concluded that while anxiety may play some part in defensiveness, the major effect of this variable seems to be on prerecognition responses rather than on the recognition threshold.³⁶

³⁶Marvin Zucherman and Arnold Buss, "Perceptual Defense and 'Prerecognition Responsivity' in Relation to Hostility, Anxiety, and Impulsivity," Journal of Clinical Psychology, XVI (January, 1960), p. 45-50.

Prerecognition responses are those responses which precede the correct identification of the stimulus.

In a recent study by Kempler and Wiener the authors reject both the subception and response-probability explanations of recognition threshold variances. They argue in favor of an explanation in terms of the part-cue which is available to the subject on each presentation of the stimulus. Their results indicated that the same subject's recognition threshold for the same word differs according to the part-cues available. Also, subjects who differ in their characteristic responses to certain stimuli have different recognition thresholds when the same part-cues are available. The authors conclude that when available cues and response characteristics are specified and controlled the effects of personality on perception can be investigated.³⁷

Taylor, et al. employed a forced choice technique in an effort to further examine the phenomenon of perceptual variation. In this case the subject was required not to identify a word but to point out the location of a given word in a list of several words presented very briefly. The authors concluded in favor of the frequency of prior usage explanation

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Bernhard Kempler and Morton Wiener, "Personality-Perception: Characteristic Response to Available Part-Cues," Journal of Personality, XXXII (March, 1964), p. 57-74.

for perceptual threshold differences.³⁸

Janet Spence in a recent study also discusses the effect of part-cues on interpretations of perceptual stimuli. She states that the more minimal the cue the more likely response biases are to influence the direction of the stimulus recognition.³⁹

Of the more recent research in the area of perceptual defense a study by Shannon seems to be most relevant to the present study. His main thesis is that persons with different types of clinical defensive patterns exhibit different perceptual thresholds for conflict related stimuli. According to Shannon's findings it is unwise to assume that an increased threshold level will be the manifestation of a defensive reaction; the reaction may in fact be the reverse. This study also used the method of increasing illumination to determine thresholds, very similar to that employed in the current investigation.⁴⁰

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J.A. Taylor and D. C. Rosenfeldt and K. W. Schulz, "The Relationship Between Word Frequency and Perceptibility with a Forced-Choice Technique," Journal of Abnormal and Social Psychology, LXII (May, 1961), pp. 491-6.

³⁹

Janet Taylor Spence, "Contribution of Response Bias to Recognition Thresholds," Journal of Abnormal and Social Psychology, LXVI (April, 1963), pp. 339-44.

⁴⁰

D.T. Shannon, "Clinical Patterns of Defense as Revealed in Visual Recognition Thresholds," Journal of Abnormal and Social Psychology, LXIV (May, 1962), pp. 370-77.

Smoking Related Research

The present experimenter found a paucity of psychological research devoted to smoking behavior. Most of the studies which have been reported are concerned with the psychoanalytic factors involved in the establishment of smoking habits and the complexity of the habit patterns of the heavy smoker. Almost no studies were found which were appropriately related to the smoking question as it was used in this study. Two studies of an attitude survey nature were included because their findings might aid in interpreting the findings of the study reported herein.

In an attitude survey conducted by Feather, smokers displayed more interest in information concerning the relationship between smoking and lung cancer than did non-smokers. They did not seek out evidence of a negative nature concerning this relationship, nor did they reject the information more than non-smokers. In rating articles which linked smoking with lung cancer, the regular smokers rated the reports as being less convincing than did the non-smokers.⁴¹

An investigation of the attitudes of a group of smokers and a group of non-smokers who viewed a television program pointing out the connection between smoking and lung

⁴¹N. T. Feather, "Cognitive Dissonance, Sensitivity and Evaluation," Journal of Abnormal and Social Psychology LXVI (February, 1963), p. 157-63.

cancer, revealed that fewer heavy smokers viewed the program than did moderate or non-smokers, even though all were equally aware of the presentation.

Those heavy smokers who did see the program tended to make more comments of a negative nature concerning the cigarette-cancer link or fewer positive comments than did the others. Few heavy smokers, who prior to the program expressed no inclination to stop smoking, changed their minds. The number of moderate smokers who said they would probably quit smoking soon increased after viewing the program.⁴²

42

Jonathan P. Lane, "Smokers Reactions to a Television Program about Lung Cancer," (unpublished Doctoral Dissertation at Stanford University) Dissertation Abstracts, XXI, 1961, p. 2812-13.

CHAPTER III

EXPERIMENTAL DESIGN AND PROCEDURE

Materials and Equipment

The basic piece of experimental equipment was a Model 1055 Keystone Overhead Projector, equipped with a 1000 watt lamp. This machine was converted to a tachistoscopic projector by the use of a Keystone Flashmeter. The flashmeter is a specially designed tachistoscopic attachment with speeds comparable to those of a good camera shutter. The speed range of this device was from one one-hundredth of a second through a full second.

In making the tachistoscopic presentation of the stimulus words it was decided to hold exposure time constant at one one-hundredth of a second and to vary the illumination of the projected image. This was accomplished by placing a type 116 Powerstat between the power source and the projector lamp. The Powerstat is manufactured by the Superior Electric Company of Bristol, Connecticut, and is a standard piece of laboratory equipment. The model used in this study had an output range of from zero to one hundred thirty-five volts, and was equipped with a calibrated dial corresponding to this range. By using this device the experimenter was able to precisely control the light intensity of the projector lamp and thus the brightness of the projected image. A model 703

Weston Sight Meter with a range from zero to seventy foot candles was used to measure the brightness of the projected image, as well as to check the available light in the room used for the presentation.

The stimulus words were made up into slides by first lettering them in black on white paper with a Leroy lettering set. The letters thus produced were .140 inches in height and were lettered with a number two Leroy pen. The finished plate was then transferred to an acetate transparency by the dry Diazo process, and the acetate was cut and sandwiched between glass to form regular $3\frac{1}{4}$ " x 4" Keystone slides.

The stimulus words were projected onto a glass beaded screen 50" x 46". A Keystone number three mask served to provide a band of light across the screen which was uniform from word to word. Each word was centered vertically and horizontally within this band of light. The height of the projected letters within this band was $2\frac{3}{4}$ inches and the width of stroke of each letter was $\frac{3}{8}$ inches. These sizes were obtained when the projector was placed ten feet, five and one-half inches from the screen.

Research Design

A three group design was employed with all three groups receiving precisely the same experimental treatment. Smoking behavior served as the variable used to distinguish the three

different groups. The three groups thus selected were classified as non-smokers, smokers, and quitters.

Selection of Subjects

All subjects were selected from students enrolled in undergraduate psychology courses at Kansas State College of Pittsburg. An initial questionnaire¹ designed to determine the smoking behavior of the individual was completed by 216 students. On the basis of the questionnaire reports the students were divided into three categories as follows:

(1) Non-smokers - persons who have smoked twenty or fewer cigarettes during their lifetime, (2) Smokers - persons who have smoked twenty or more cigarettes per day for a period of at least one year, (3) Quitters - persons who were regular smokers (20 or more per day) for a period of at least one year, but who have completely stopped smoking within the last year. Due to the difficulty of classifying and evaluating the smoking behavior of those who had reduced the number of cigarettes smoked or who had switched to pipe and cigar smoking, persons making this report were not included in the study.

Since age, sex and intelligence were considered to be important variables, which might influence performance on the

¹

See appendix for reproduction of this questionnaire.

perceptual recognition task, it was decided to use the method of matched pairs or in this case, matched trios, in selecting the subjects for the three groups. No subject was used who had a visual defect which was not corrected by lenses.

Using the American Council on Education test scores as a measure of intelligence, matched subjects were selected for the three groups. Since there were too few subjects available to allow exact matchings, certain limits of variation were allowed in making the matches. Variations in age were limited to one year, and ACE scores could vary no more than six points. The use of this selection procedure automatically established minimum and maximum limits for the whole population. Table I shows the composition of the total population by groups.

TABLE I

CHARACTERISTICS OF TOTAL POPULATION BY GROUPS

Group	Number	Age Range	Mean Age	ACE* Range	Mean ACE
Non-Smokers	20	19-21	19.6	67-149	109
Smokers	20	18-22	19.8	69-155	109.5
Quitters	11**	18-21	20.0	80-151	115.8
Total	51	18-22	19.8	67-155	111.4

*ACE - American Council on Education Psychological Test for College Freshmen.

** The smokers and non-smokers groups were equally divided as to sex. In the quitter group there were 9 males and 2 females.

Selection of Stimulus Words

Twenty-four stimulus words were used in the tachistoscopic presentation. Twelve words which were assumed to have anxiety producing power for a cigarette smoker were matched with twelve neutral words chosen from the Thorndike-Lorge word tables.² The neutral words selected were reported to have the same frequency of usage as the smoking related words. In addition only those neutral words which contained the same number of letters and resembled the threatening words in configuration were selected. The matched smoking related and neutral words are set forth in Table II.

TABLE II

MATCHED LIST OF STIMULUS WORDS

Smoking Related Words	Neutral Words
Cigarette	Chairman
Cough	Crumb
Inhale	Invoke
Lung Cancer	Sour Grapes
Nicotine	Newsreel
Smoker	Shrimp
Surgeon General	Attorney General

² E. L. Thorndike and I. Lorge, The Teachers Word Book of 30,000 Words (New York: Columbia University Press), 1944.

TABLE II (continued)

Smoking Related Words	Neutral Words
Surgery	Scamper
Tobacco	Traffic
Tumor	Tempo
Ulcer	Ultra
X-ray	Zebra

The neutral and smoking related words were randomly distributed within the two halves of the list of twenty-four. Care was taken to equally divide the threat words between the two halves of the list to equalize any practice effect. The resulting order of presentation had no pattern of threat and neutral words.

Experimental Setting

Since a fairly large number of subjects was involved in this investigation and since the tachistoscopic presentation required approximately forty minutes, it was decided to employ a group presentation of the stimulus words. This required the construction of a response sheet designed to enable the subject to record his own responses. The response sheet provided spaces for recording the word perceived by

the subject on each exposure of each stimulus word.³

Two pilot studies were conducted in order to determine the practicality of this approach as well as to check on the experimental procedure and functioning of the apparatus. In neither case was there any evidence of cooperation between subjects, alteration of previously recorded responses by subjects, or responses being influenced by forces of social dynamics. In both the pilot runs and the experimental runs the subjects were highly cooperative and followed the experimenter's directions explicitly.

To provide for the differences in the class schedules of the subjects, three experimental sessions were conducted. (Twenty subjects attended the first session, twenty-three the second, and eight subjects were present at the final session.)

The Tachistoscopic Presentation

The tachistoscopic presentation was made in a classroom twenty-four feet wide by thirty feet in length with windows along the east wall. These windows were equipped with venetian blinds which enabled the experimenter to regulate the available light in the room. To provide for the effects of placement of individuals in relation to the

³A copy of this response sheet has been placed in the appendix.

screen, non-smokers, smokers, and quitters were systematically seated throughout the room by pre-marking the seats with the symbols S, N, or Q. This gave no group a visual advantage. A diagram of the room showing placement of the equipment can be found in the appendix. The room was conspicuously marked as a testing place and no interruptions were experienced.

Immediately preceding the arrival of the subjects the arrangement and operation of the apparatus was checked and the available light in the room was adjusted by manipulating the venetian blinds. The level of available light was the same for each experimental session.

As soon as the subjects were seated the experimenter read to them the following directions:

This is an experiment in visual perception. I want to find out at what level of illumination you can see and read certain words. A series of words and word-pairs will be flashed on the screen for very brief exposures. The first exposure for each word will be not only brief, but dim, that is, at a low level of illumination. The brightness of the projected image will be increased with each subsequent exposure until the maximum brightness is reached on the tenth exposure. This procedure will be followed for each word in the series.

Now look at your response sheet booklets. You will notice that there is a space provided for you to write your response to each exposure of each word. It is very important that you make an entry on your response sheet after each exposure of each word. If you have no idea what word was flashed, enter the word none for that exposure and for each subsequent exposure until you think you perceive the word. Enter the word you think you saw even though you are not certain.

Do not wait until you are certain before entering a word response. Once you have entered a word response, that is, some word other than none, continue to enter that response or a different word response on the remaining exposures. For example - you might perceive the word airplane on some exposure of that word. You would write airplane in the blank for that exposure and for each subsequent exposure unless you change your mind later in the series. You might decide on a later exposure that the word is actually airport rather than airplane. In this case you would write the word airport for that exposure and for each remaining exposure unless you change your mind again. In case this happens, do not change your prior responses even though you are now certain they were wrong. Remember, I want to know what you thought you saw on each exposure.

It is very important that you remain silent throughout this experiment. Do not talk, whisper or otherwise communicate with your neighbor.

At this point subjects were instructed in the proper placement of some identifying information on the response sheet.

Now, turn to the last page of your response sheet booklet. This page should be clearly marked TEST TEST TEST, and should have provisions for only three words. If your booklet does not have this sheet, let me know now! Leave your booklet open to this page as we will use it first for some practice before we proceed with the experimental words.

Now, look at the screen. I will project a band of light on the screen. Notice carefully the location of this band of light and remember this location. This band of light will appear with each exposure and the word or word-pair will be centered in this band. Just before each exposure I will announce the number of the word and the number of the exposure. Example -- Exposure 1, word number one. When you hear me say these words, direct your attention to the spot on the screen where you saw the band of light as the exposure will follow directly.

This is not a test that will affect your grade in this or any other course. The results of this test

will not appear at any place in your college record. Your response sheets will be kept confidential and will be destroyed as soon as the data is compiled. Are there any questions?

Now, we are ready to proceed with this experiment. Be sure your booklet is opened to page four, marked test. Remember to remain silent throughout the experiment, and be sure to enter a response for each exposure of each word. Write the word none if you have no idea what word was flashed.

Upon completion of the directions the experimenter presented the three practice words (vision, experiment, attention) using exactly the same procedure for these as for the twenty-four test words.

All words were exposed ten times at a constant exposure time of one one-hundredth of a second. The exposures were spaced twenty seconds apart to allow time for recording the response and redirecting attention to the screen. The first exposure of each word was made at an illumination of two foot candles. This measure was taken six inches in front of the projector lens. On each subsequent exposure the illumination was increased by four foot candles. The two pilot studies had indicated that the initial exposure was subliminal for all subjects and that the tenth and final exposure was bright enough to be perceived by all.⁴

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During the experimental sessions, the words "x-ray", "zebra" and "cough" were perceived one time each on the initial exposure. It is interesting to note that the three individuals making these early perceptions were all smokers. Since two of these words are threat words, this would not be expected according to the hypothesis.

Administration of the MMPI

As soon as the tachistoscopic presentation was concluded, the subjects were given the standard instructions for the MMPI and were allowed to begin this test. The subjects were informed that they need not complete the test at that time, but were encouraged to work as long as they wished. Several subjects did not complete the test during the initial session, but finished it later, usually during class time made available by their instructors.

CHAPTER IV

RESULTS OF THE EXPERIMENT

Differences Between Recognition Thresholds for the Two Types of Stimuli

The data was first analyzed in an effort to determine if the response thresholds for the threat words were significantly different than those for the neutral words. In other words, the experimenter was attempting to ascertain if the smoking related words were actually defended against by either of the groups. The .05 level of significance was established as the criterion for testing the hypotheses of this research.

Table III presents the difference between the mean recognition scores for threat and neutral words for Non-Smokers, Smokers and Quitters. Also presented are the standard deviation for the set of recognition scores, and the standard error of the differences between the correlated mean scores. A minus difference score indicates that reported recognition of threat stimuli is at a lower threshold than reported recognition for neutral stimuli. A positive difference score indicates that the threat words have a higher threshold than the neutral words.¹

¹The comparisons of these differences were made in the

TABLE III

DIFFERENCE BETWEEN MEAN RECOGNITION SCORES
FOR THREAT AND NEUTRAL STIMULI

Group	Threat		Neutral		Differences		't'
	M	SD	M	SD	M	SEMD	
Non Smokers	4.52	.850	4.68	.886	-.16	.47	-1.64*
Smokers	4.69	.877	4.60	.940	.09	.11	.64*
Quitters	4.70	1.042	4.78	.825	-.08	.15	-.47**

*'t' needed for significance at .05 level --2.09

**'t' needed for significance at .05 level --2.23

Although none of the 't' values obtained in these tests reached significance at the .05 level, it should be noted that the difference between the two classes of stimuli in the case of the non-smokers approached significance, but in the direction opposite to that expected.² The same was true for the quitters but to a much lesser degree.

According to this analysis no significant differences

manner suggested by McNemar for comparing differences of correlated means. Quinn McNemar, Psychological Statistics (New York: John Wiley and Sons, Inc., 1962), p. 79.

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See Edwards for a discussion of the 't' test. A. L. Edwards, Statistical Analysis for Students in Psychology and Education (New York: Rinehart and Company, 1946), p. 295.

were discovered between the recognition levels of the different stimuli in either of the groups.

Differences Between the Mean Levels of Perceptual Defense of the Three Groups

In testing the major hypothesis of this study the experimenter was faced with the problem of comparing group characteristics. Since it was desired to find out if there were significant differences between the degree of perceptual defense exhibited by the three groups, a test of difference was computed between the mean perceptual defense scores for the determination of significance of the differences.

Table IV presents the differences between the mean levels of perceptual defense exhibited by the three groups.³ Also presented are the values of 't' obtained when the differences were tested for significance.⁴ None of the 't' scores thus obtained reach significance.

³ In testing for these differences the standard error of the differences was calculated using the raw score method and according to the procedures and formulae suggested by Edwards - A. L. Edwards, Statistical Analysis (New York: Rinehart and Co., 1959), p. 131.

⁴ The values of 't' were obtained by applying to the data the formula suggested by Edwards, Ibid., p. 133.

TABLE IV

DIFFERENCES BETWEEN THE MEAN LEVEL OF PERCEPTUAL DEFENSE
EXHIBITED IN THE THREE GROUPS

Group	Mean Level * of P.D.	Group	Mean Level of P.D.	SE _D	't'
Non-Smokers	-.16	Smokers	.085	.151	1.62
Non-Smokers	-.16	Quitters	-.090	.172	1.46
Smokers	.085	Quitters	-.090	.188	.032

*Perceptual defense was calculated by subtracting the mean response level for neutral stimuli from the mean response level for threat stimuli.

On the basis of this test, the hypothesis that there would be significant differences in the degree of perceptual defense shown by the three groups to the smoking related stimuli was rejected.

Differences Between the Percentage Content of the Groups

Many times in experimental situations it is possible to compute the percentages of subjects in two or more groups that exhibit a certain behavior, when it is not feasible to measure the behavior in terms of test scores.⁵ Even though in this

⁵
H. E. Garrett, Elementary Statistics (New York: David McKay Co., Inc., 1962), p. 135.

case the behavior in question could be and was measured and evaluated, it was felt that the test for percentages would add greater perspective to the results of the experimentation.

The responses of the three groups were analyzed and the percentage of the membership which exhibited some degree of perceptual defense was determined for each of the groups. Any person whose mean response level for smoking related words was greater than his mean response level for neutral words was considered to have shown some amount of perceptual defense. If the two sets of stimulus words were actually equal in all other respects, then such a difference would indicate the existence of the phenomenon in question. The significance of the difference in the percentages of the three groups are presented in Table V.⁶

TABLE V

DIFFERENCES IN PERCENTAGES OF SUBJECTS EXHIBITING SOME DEGREE OF PERCEPTUAL DEFENSE WITHIN THE THREE GROUPS

Group	Per Cent Exhibiting P.D.	Group	Per Cent Exhibiting P.D.	SE _D	't'
Non-Smokers	30	Smokers	70	15.8	2.53*
Non-Smokers	30	Quitters	54.5	18.3	1.37
Smokers	70	Quitters	54.5	17.8	.84

*Significant at the .05 level of confidence.

The 't' value obtained in comparing the smokers with the non-smokers indicated that even though the original hypothesis was not supported, there were more persons exhibiting perceptual defense within the smoking group. The difference between the percentage of smokers who exhibited perceptual defense and the percentage of non-smokers who exhibited this behavior was significant at the .05 level.

Correlations of Perceptual Defense with Anxiety Measures

As stated in Chapter II the theoretical basis for the behavioral phenomenon called perceptual defense stems from Freudian theories of repression and ego-defensive reactions. The classic explanation for perceptual defense, that given originally by Bruner and Postman, states in part, "The bulk of experimental and clinical evidence points to blockage as the process producing increase in association time to emotionally charged stimuli. Such blocking in association represents a defense against anxiety-laden stimuli."⁷ Considering the implications of this explanation together with several others, all quite similar in their mention of anxiety

⁶ The calculations for this test were done according to formulae and procedures set forth by Garrett, Ibid., pp. 135-6.

⁷ J. S. Bruner and L. Postman, "Emotional Selectivity in Perception and Reaction," Journal of Personality (September, 1947) XVI, p. 74.

as a producer of perceptual defense, the experimenter sought to examine the relationship between perceptual defense scores and anxiety scores for the subjects within each of the groups.

The anxiety measures used were taken from scales of the Minnesota Multiphasic Personality Inventory. Both the Taylor Manifest Anxiety Scale and the Welsh A Scale have been widely used in experiments of this nature. Although the MAS was not designed by Taylor as a clinical measure, it has been so used. It was constructed, as was the Welsh A scale, from items contained within the complete MMPI. The Taylor MAS has been widely used as a measure of motivation in learning studies, but in as much as it has exhibited about as much clinical validity as the Welsh, the writer concluded that it would be appropriately used in this investigation.⁸

Since both of these measures of anxiety have much to be said in their favor, and since some authorities feel the Welsh A Scale to be the best measure of anxiety,⁹ the experimenter chose to score and correlate both of these scales with perceptual defense.

Considering the popular clinical opinion that persons suffering from hypochondriasis are abnormally concerned with

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W. G. Dahlstrom and G. S. Welsh, An MMPI Handbook: A Guide to Use in Clinical Practice and Research (Minneapolis: The University of Minnesota Press, 1960), pp. 290-94.

⁹Ibid., p. 295.

their bodily functions, the experimenter felt that a high degree of perceptual defense might be expected to be accompanied by a high score on Hypochondriasis Scale of the MMPI. It would seem to follow logically that a person who tended to be very anxious about the effects of cigarette smoking on his health would also tend to be generally concerned over his other bodily functions. This scale was also scored and the correlations for it and for the measures of anxiety are presented in Table VI.¹⁰

TABLE VI

CORRELATIONS BETWEEN LEVEL OF PERCEPTUAL DEFENSE *
AND SELECTED MMPI SCALES

Group	MAS **	Welsh A Scale	HS Scale
Non-Smokers	-.05	-.11	-.24
Smokers	.16	.05	-.10
Quitters	.06	.00	-.03

*Perceptual defense determined by subtracting each subject's mean response level for neutral words from his mean response level for threat words.

**Taylor Manifest Anxiety Scale.

¹⁰The coefficients of correlation reported in Table VI were computed directly from ungrouped scores according to the formula and procedure suggested by Garrett, op. cit., pp.93-94.

None of the correlations between perceptual defense and measures of anxiety or hypochondriasis were significant. The MAS showed the highest correlation with perceptual defense in the smoking group which contained the greatest percentage of persons exhibiting the phenomenon to some degree. All of the correlations for the non-smokers were negative which was not surprising in view of their nearly significant tendency to perceive the smoking words more readily than the neutral words.

Though not significant, all of the correlations obtained between perceptual defense and hypochondriasis were negative. This would tend to indicate that the type of anxiety responsible for perceptual defense is not closely related to hypochondriasis as measured by the MMPI.

Compared Rankings of the Stimulus Words

In order to compare the expected with the actual or demonstrated threat power of the smoking related words, the experimenter asked six members of the psychology staff to rate the twelve threat words from most threatening to least threatening. This rating was done prior to the experimental presentation, and Table VII illustrates the comparison of the instructors' rankings with rankings determined on the basis of the amount of perceptual defense evoked by each word. Both rankings are from most to least threatening.

TABLE VII

A COMPARISON OF THE THREAT PRODUCING POWER OF THE
SMOKING RELATED WORDS

* Ranking by Psychologists	* Ranking by Level of Perceptual Defense Evoked
Lung Cancer	Smoker
Tumor	Ulcer
Surgery	Nicotine
Cough	X-ray
Ulcer	Surgeon General
Nicotine	Lung Cancer
Inhale	Inhale
Surgeon General	Tobacco
X-ray	Tumor
Smoker	Cough
Cigarette	Surgery
Tobacco	Cigarette

*in order of greatest to least threatening

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study was undertaken in an attempt to relate the recent and widespread emphasis on the hazards of cigarette smoking to the behavioral phenomenon of perceptual defense. In view of the great numbers of persons who have reportedly modified their behavior as it relates to smoking, the experimenter felt that some of the dynamics underlying this behavioral shift might be experimentally investigated. It was felt that such an investigation might lend some insight into the personality factors associated with smoking, as well as to add to the accumulated knowledge of perceptual behavior.

Specifically, the investigation was concerned with the visual recognition behaviors of individuals of three categories of smoking behavior. It was hypothesized that persons who had recently stopped smoking would react most defensively to stimuli related to smoking, and that regular smokers would exhibit more perceptual defense than would non-smokers, who should have no reason to feel anxious about smoking related stimuli.

Words closely related to cigarette smoking and a matched list of neutral words were presented tachistoscopically to the subjects. Reported visual recognition was

measured by the level of illumination required for identification. The tests of recognition thresholds were taken in group settings using specially designed response blanks.

Statistical analyses designed to measure the difference between the amount of perceptual defense exhibited by the three groups indicated that no significant differences were obtained. Thus the basic hypothesis was rejected.

Although not in support of the basic hypothesis, a post hoc investigation revealed that there were significantly more persons exhibiting perceptual defense in the smoking group than in either of the other groups.

The prediction that the level of perceptual defense exhibited by the subjects would be positively correlated with the anxiety level of the subject was not confirmed.

Conclusions

In view of the statistical evidence, the conclusion was reached, that for this population sample, under these particular experimental conditions, perceptual defense toward smoking related words was not reliably demonstrated.

It was further concluded that anxiety, as measured by both the Welsh A Scale and the Taylor Manifest Anxiety Scale, was not demonstrated to be correlated with perceptual defense. Hypochondriasis, as measured by the MMPI, also failed to yield a significant correlation with perceptual defense.

Recommendations

The present writer feels that more research is needed in this area - not only to bolster or disprove some particular theory of perceptual defense, but to provide more information concerning smoking behavior. Such additional information may lead to an eventual understanding of the dynamics of smoking behavior, that will enable psychologists to make effective advances in controlling this problem. Such research properly conducted should yield additional information on perception as well as personality theory in general.

It is recommended that an investigation similar to the one herein reported be conducted with larger samples drawn from a more general population of middle aged persons. A more precise tachistoscope, providing very minute increments of adjustment, would be a definite asset in conducting such a study.

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APPENDIX

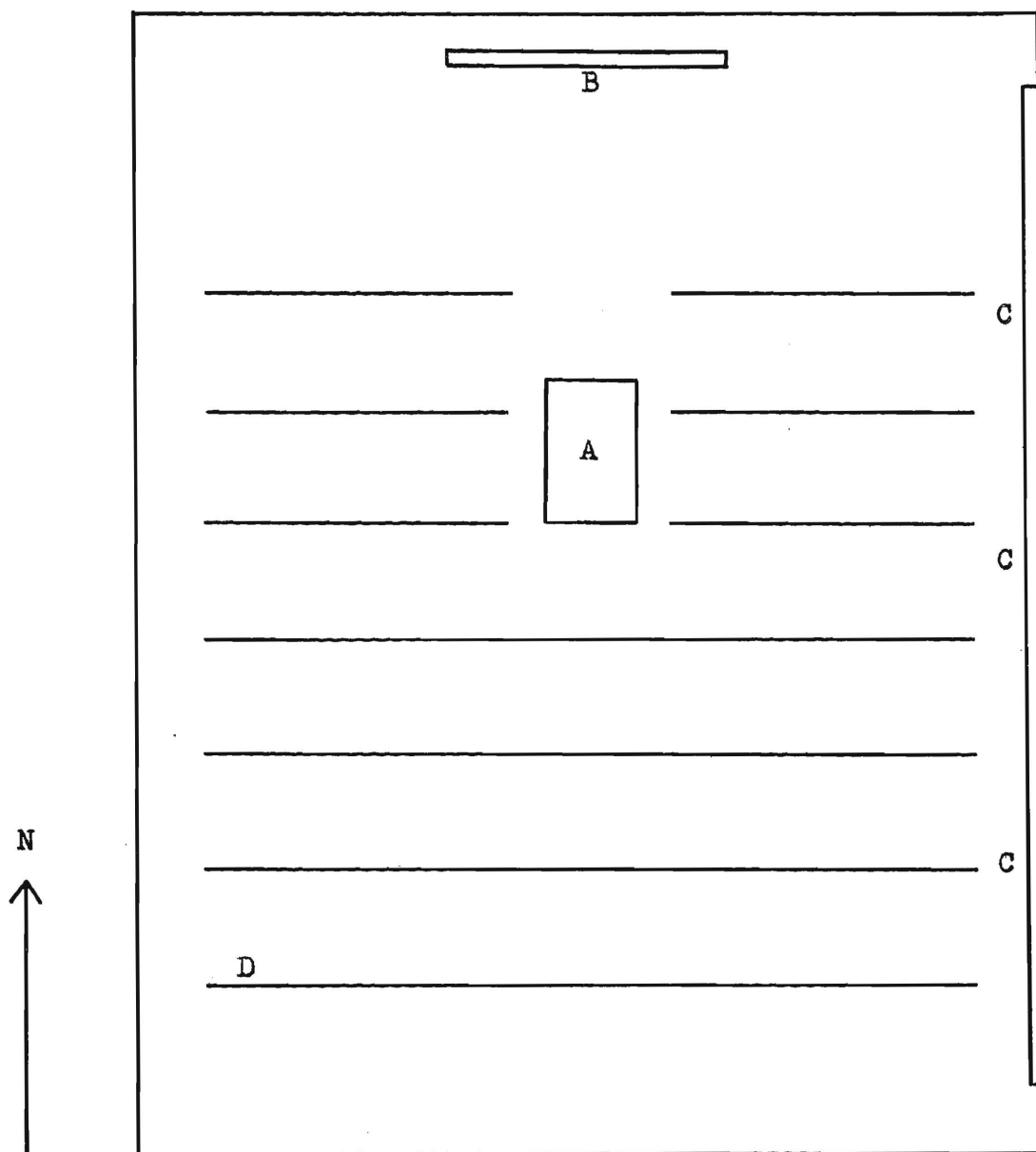


Figure 1

Setting of the Stimulus Projection Room Showing
Placement of Equipment

-
- A - Projector and Powerstat Control
 - B - Screen
 - C - Windows
 - D - Rows of Chairs

Name _____ Age _____ Sex _____ Height _____ Wt. _____

Instructor _____

This is a questionnaire concerned with the smoking habits of college students. The information gained from this instrument will be used in a psychological experiment. This is not a test, and this information will have no bearing upon your grade in this or any other course. This information will be kept confidential, and the questionnaires will be destroyed upon completion of the experiment. Your name is necessary only in that it will serve to identify this information for a second phase of the experiment. Your participation in this experiment is on a purely voluntary basis.

PART I

Please read the items below carefully and check the one item which best describes your personal smoking habits.

I smoke cigarettes at the rate of -

- _____ none at all
- _____ five or less per day
- _____ ten or less per day
- _____ approximately one pack (20) per day
- _____ between one and two packs per day
- _____ two or more packs per day

PART II

Read the following items and check those which best describe your own personal history of smoking. On this part you may check more than one item provided all items checked contribute to the description of your history of smoking.

- _____ I have never smoked at all.
- _____ I have smoked less than 20 cigarettes in my entire life.
- _____ I have been a regular smoker for less than one year.
- _____ I have been a regular smoker for one to two years.
- _____ I have been a regular smoker for three years or more.
- _____ I have seriously thought about taking up the habit.
- _____ I have seriously thought about giving up smoking.
- _____ I have tried, unsuccessfully, to stop smoking.
- _____ I have "cut down" or reduced the number of cigarettes I smoke.
- _____ I have switched from cigarettes to a pipe.
- _____ I was once a regular smoker, but I have recently given up the habit completely.

WORD RESPONSE SHEET

58

Name _____ Age _____ Sex _____ Date _____ Time _____ Code No. _____

Instructor _____

Exposure No.	Word No. 1	Word No. 2	Word No. 3	Word No. 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Exposure No.	Word No. 5	Word No. 6	Word No. 7	Word No. 8
1				
2				
3				
4				
5				
6				
7				
8				
9				

WORD RESPONSE SHEET

Exposure
No.

Word No. 9

Word No. 10

Word No. 11

Word No. 12

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Exposure
No.

Word No. 13

Word No. 14

Word No. 15

Word No. 16

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

WORD RESPONSE SHEET

posure
No.

Word No. 17

Word No. 18

Word No. 19

Word No. 20

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

posure
No.

Word No. 21

Word No. 22

Word No. 23

Word No. 24

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

WORD RESPONSE SHEET

TEST TEST TEST TEST TEST TEST

Use this page only for the trial run ! !

Exposure
No.Test
Word No. 1Test
Word No. 2Test
Word No. 3

1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

TABLE VIII

CHARACTERISTICS OF ALL SUBJECTS WHO COMPLETED
THE INITIAL QUESTIONNAIRE

Group	Number	Sex		Age Range	Mean Age	ACE Range	Mean ACE
		M	F				
Non-Smokers	117	43	74	18-51	21.5	59-150	104.8
Smokers	83	54	29	18-39	22.7	93-169	109.8
Quitters	16	13	3	18-42	27.2	72-151	111.7
Total	216	110	106	18-51	21.9	43-169	107.2