Negation and related levels of defensive verbal behavior.

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http://hdl.handle.net/2144/15544

Boston University
BOSTON UNIVERSITY
GRADUATE SCHOOL

Dissertation

NEGATION AND RELATED LEVELS OF
DEFENSIVE VERBAL BEHAVIOR

by

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Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy 1959
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ACKNOWLEDGMENTS

This research project could not have been completed without the interest and help from several individuals.

I am grateful, first of all, to my three committee members, Professor Henry Weinberg, Professor Murray Cohen, and Professor Austin Berkeley for their continual support and assistance.

A special note of thanks is due Professor Charles Slack of Harvard for his encouragement and also for his arranging for partial monetary support through the Foundations' Fund for Research in Psychiatry. I am indebted to Professor Richard Jones of Brandeis for his collaboration on the topic of negation. Several discussions with Professor Sarnoff Mednick were also helpful during the early stages of the research.

I am grateful to Mrs. Helen Grieve and Mr. David Wilder for their interest and encouragement throughout the study.

Finally, I would like to express my thanks to Mr. Joseph Lieberman for building the electrical apparatus and to Mr. Marion Novak for photographing and reproducing the data sheets.
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CHAPTER I

A THEORETICAL OVERVIEW OF THE CONCEPT OF NEGATION

The purpose of this study is to test experimentally some important implications of the psychoanalytic thought-mechanism of negation. More specifically, the writer proposes to study negation in only one of its functions—namely as a higher level derivative of a defense mechanism.

In this chapter the concept of negation will first be discussed as it relates to general psychoanalytic theory. There will next be a discussion of the role of negation in certain basic problems in psychoanalytic theory. Following this there will be a discussion of the various ways negation is used in an adult psyche. Finally, negation will be distinguished from defense mechanisms in general, and then from the specific mechanisms of denial and isolation.

Negation and Psychoanalytic Theory

Psychoanalytic theory, since its origin in the late nineteenth century by Freud, has since undergone considerable development and refinement. Freud and his followers, in developing the early stages of the theory, were mainly concerned with unconscious phenomena and the instincts and their vicissitudes. However, since the publication of
"Fragment of An Analysis of a Case of Hysteria" by Freud in 1905, analytic writers have shown an ever increasing interest in the group of functions of the mental apparatus that are conceptualized as "ego". These functions broadly include thinking, feeling, perceiving, controlling, and creating. In 1936 Anna Freud published her classic book, "The Ego and the Mechanisms of Defense". This book presented a systematic review of the ego functions that serve basic defensive ends. This book also provided further stimulation for the investigations of related and more highly organized ego functions. Thus over the past two decades ego investigations have become the primary focus of analytic writers.

With this modern emphasis on the ego, the concept of negation has recently been brought to the foreground as one of the most basic functions of the ego—if not the most basic function.

Freud first introduced the concept of negation in 1915 with his paper, "The Unconscious". He stated, in speaking

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of the unconscious system,

"There is in this system no negation, no dubiety, no varying degrees of certainty; all this is only imparted by the work of the censorship which exists between the unconscious and preconscious. Negation is, at a high level, a substitute for repression. In the unconscious there are only contents more or less strongly cathected."

In 1925 Freud published his paper on "Negation". In this paper he outlines the essential characteristics of negation,

"Thus the subject-matter of a repressed image or thought can make its way into consciousness on condition that it is denied \( \neg \text{negated} \). Negation is a way of taking account of what is repressed; indeed, it is actually a removal of the repression, though not, of course, an acceptance of what is repressed. It is to be seen how the intellectual function is here distinct from the affective process. Negation only assists in undoing \( \neg \text{undoing} \) one of the consequences of Repression—namely, the fact that the subject-matter of the image in question is unable to enter consciousness. The result is a kind of intellectual acceptance of what is repressed, though, in all essentials the repression persists.

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5Rapaport feels that the translation is inaccurate. Freud was clearly not referring to the defense mechanism of denial. Therefore "negated" should be substituted for "denied" in the above. D. Rapaport, Organization and Pathology of Thought (New York, Columbia Univ. Press, 1951), p. 340.

6Rapaport feels that "undoing" is a poor translation for
"In the course of analytic work we often bring about a further very important and somewhat bewildering change in the same situation. We succeed in also defeating the negation and in establishing a complete intellectual acceptance of what is repressed— but the repression itself is still not removed."

In the latter part of the quotation Freud seems to be referring to what is generally identified in present clinical practice as intellectual insight.

**Negation as a Primary Function in Judgment**

Freud\(^7\) then develops his main theme of tracing the function of judgment from primitive instinctual sources by employing the concept of negation.

"...Judging is the intellectual action which decides the choice of motor action, which puts an end to the procrastination of thinking, and which leads over from thinking to acting... thus it is the business of the function of intellectual judgment to affirm or deny the subject matter of thoughts....The study of judgment affords us, perhaps for the first time, an insight into the derivation of an intellectual function from the interplay of primary instinctual impulses. Judging has been systematically developed out of what was in the first instance introduction into the ego or expulsion from the ego carried out according to the pleasure-principle."

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\(^7\)"Negation", op. cit., pp. 182, 184, 185.
Rapaport states that "the psychoanalytic concept of judgment is closely linked with the 'reality principle' and the function of 'reality testing.'" If the mechanism of negation, basic to the "secondary process", is the basic tool used in the function of judgment, and judgment is closely linked to 'reality testing', then the question arises as to when in the history of an individual did reality testing (or negation) emerge. The answer to this question is of the utmost theoretical importance in determining the extent of ego autonomy.

In discussing the origin of reality testing Freud states:

"...it is evident that an essential precondition for the institutions of the function for testing reality is that objects shall have been lost which have formerly afforded real satisfaction."

Rapaport clarifies Freud's statement as follows:

"'Lost' apparently here means 'absent' or delayed in appearance. The delay in the appearance of the need-satisfying object, according to Freud, originally gives rise to a hallucinatory experience of the object, and this in turn becomes the point of departure for the arising of memory images and their organization. The search in reality for the need-satisfying object, with the help of these images, is the prototype of the thought-process."

9 "Negation", op. cit., p. 184.
Thus the infant's attention, as a result of fortuitous object absence, is first turned to the memory of the satisfying object, which probably provides partial satisfaction, and then is turned back towards objective reality in order to rediscover the object. Now, the question arises as to what makes the infant first turn to the memory of the object, and then back in search of the object. That is, can we speak of the absent object or other non-gratifying objects as being negated at this stage (an active, secondary process operation), or is it more reasonable to think of the memory of the gratifying object as being affirmed, (a passive, primary process operation)?

Freud\(^{11}\) favored the second alternative but did not eliminate the first alternative as initially playing a part.

R. Jones, in a recent convincingly-argued theoretical contribution,\(^{12}\) postulates a transitional process in which negation first comes into play as a rejection of the memory of the satisfying object because it is an inadequate substitute for the object itself. He views the transitional sequence as follows: Fortuitous drive-satisfying-object absence causes the infant in reflex fashion to dwell on the hallucinatory image. Because only partial satisfaction is

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\(^{11}\) S. Freud, "The Interpretation of Dreams". In The Basic Writings (New York, Modern Library, 1938), p. 545.

obtained from the image, the drive "defuses"--the libidinal element withdraws (decathects), leaving the aggressive element which is conceived of as an instinctual "no". With this instinctual "no", the infant has in effect made a "decision" and has committed himself to the responsibility of achieving more adequate satisfaction from the world of objects. Thus the newly formed ego now uses the energy obtained from the "neutralized libido", for search activity in the world of objects and in countercathetic activity toward the hallucinatory image. The sequence can have three main outcomes: If the ego successfully finds the satisfying object, then its countercathexis against the image retains flexibility ("controlling countercathexis"), and the ego can utilize the image as more or less of a guide in further search activity. If the ego is not successful in finding the need-satisfying object then it can either dwell on its incompetency, at the same time rigidifying the countercathexis of the image ("defensive" or "repressive" countercathexes), or, it can revert back to the image and "eat its own no" ("breakthrough of the repressed image"). Jones postulates that the neurotic thought processes are patterned after the second outcome, and psychotic thought processes are patterned after the third outcome.

Jones' argument for postulating the emergence of negation
with the infant's rejection of the hallucinatory image hinges on the idea that before this event there is no cause for a discharge delay with consequent "neutralization" of libido; for whenever there is fortuitous removal of the need-satisfying object, the capricious and mobile primitive cathexis immediately turns to the hallucinatory image by reflex action. There is no decision connected with the event. However, there is a decision connected with turning from the hallucinatory image, for the image is not subject to fortuitous removal. The delay of discharge stems from the infant's initial conflict, namely, "...experiencing the capricious 'yes' of the primary process subjected to the pre-autonomous 'no' of the transitional process."13 Jones' thesis seems to be entirely reasonable if one assumes that ego autonomy emanates from conflict, and that there are no "conflict free" ego functions from the very beginning. In connection with this idea, Grauer14 has recently put forth a persuasive argument against the necessity of postulating a "neutralization" process to explain the emergence of all autonomous ego functioning. He argues that if one views the ego and the id as structurally separate mental insti-

13 Ibid., p. 11.

tutions obtaining their energy from a common source, then it becomes quite reasonable to conceive of a conflict free ego sphere from the very beginning.

In a recent illuminating book, Spitz\textsuperscript{15} tends to stay closer to the data of observed infant behavior in his theory building. While Jones traces the emergence of the infant's first \textit{internal} decision, Spitz traces the emergence of the infant's first \textit{external} decision. The infant's first \textit{internal} decision—negation of the hallucinatory image—is said to emerge by way of "intraphychically initiated delay" due to the pain of frustration of the instinct in the form of undersatiation. The infant's first \textit{external} decision—the avoidance head-shaking gesture terminating feeding, emerging after about three months—comes about due to the pain of oversatiation of the instinct. In the first instance the decision perhaps is not so much to avoid but to seek and affirm elsewhere. In the second instance the decision is primarily to avoid. The above, interestingly enough, might serve as a model for understanding how "both ends" of the decision process originated—i.e., how a person learns to tell whether or not he has had "too much" or "too little".

It must be emphasized, however, that these are very primitive

decisions. We can hardly speak of them as stemming primarily from reality testing of a secondary process ego. Both are perhaps best conceptualized, according to Jones' idea of an instinctual "no", or as Freud might have it, as decisions by a "purified pleasure ego" still mainly operating via the pleasure-pain principle. The later "no" of the reality ego has more of a connotation of "going against". We might conceive of the _external_ decision, however, as coming chronologically later, and by its _avoidance_ nature as embodying an observable prototype for secondary process functioning.

Spitz traces the beginning of uniquely human characteristics with the emergence of the semantic gesture of "no", by word and/or headshaking, occurring in the infant at about fifteen months. This triumphant gesture of independence can be understood as the culmination of a number of forces in infant-environment complex. Spitz argues that its expression can be explained partly via the psychological defense mechanism of "identification with the aggressor", partly through the innate motor patterns of rooting (lateral head movements at birth having the apparent function of seeking the nipple), and partly via the redistribution of cathexes that occurs as the infant communes with its surroundings. Spitz speculates that the motor prototype for the semantic headshaking "no" is the above mentioned rooting behavior. The psychological
prototype, he feels, is the head shaking avoidance reaction occurring at about three months. The immediate psychological mechanism that causes it is the defense mechanism of identification with the aggressor. The child, as a means of coping with severe frustrations imposed by his parents on his will, identifies with the frustrator, and by so doing commits himself to the beginnings of personal responsibility.

The significance of the emergence of the resulting semantic "no" is tremendous, for it has, according to Spitz, at least the following meanings: It marks a great advance in the ego function of reality testing, making this function vastly more efficient. The "no" directed against the parent enables the infant to turn its aggression outward and, at the same time, reflects a change from passive to active mastery. The semantic "no" represents the infant's first abstraction, and thus paves the way for language development. It marks the initiation of judgment and conscious volition. It marks the separation of the functions of communication and action. Before the semantic "no", these functions were synonymous. It reflects the emergence of self awareness. It marks the beginning of allocentric objectrelations from their heretofore egocentric character.

Another function which Spitz implies but does not state is that this occasion probably marks the beginning of the
basic defense mechanism of secondary repression through the
initiation of countercathetic activity that is patterned
after the "going against" quality of the semantic "no" ges-
ture. This writer, incidentally, finds it difficult to
accept Jones' conception of countercathetic activity as
occurring much earlier with the rejection of the hallucin-
atory image.

The Nature of Negation as a Matured Thought Mechanism

Jones\textsuperscript{16} states that negation in its matured form func-
tions as a "part process" in secondary thought organization.
More specifically, it is an integral aspect of judgmental
thinking.

He states that the thought mechanism of negation "... models itself after the pattern of going against something that is represented from within,"\textsuperscript{17} and in so doing "circum-
vents" the repressive countercathexis rather than "trans-
forming" it. If the latter were the case, then the repressed
affect would come into consciousness, a circumstance not
characteristic of observed negated material.

Jones then states that negation can serve as a higher
level derivative of a defense mechanism or it may serve
reality testing, synthesis, or other adaptive ego functions.

\textsuperscript{16}\textit{Op. cit.}, pp. 21, 22.
\textsuperscript{17}\textit{Ibid.}, pp. 23, 24.
As a derivative of a defense mechanism its adaptiveness lies in the flexibility that it provides in enabling an individual to express a defensive attitude in the most socially harmonious manner at a given moment. On the other hand negation may serve non-defensive functioning by freeing an expressive thought from any repressed derivatives that may be connected with it, thus facilitating a more precise communication.

Jones cites the following speech automatisms as examples of the above, "I don't mean to be rude, but....", "I don't mean to change the subject, but....", "Not that he was exactly boring, but...." Jones cites several other examples of adaptive functioning mediated via negation. The interested reader is referred to them.

Jones cites two other broad ego functions that utilize negation. The first he calls "perspective-alternation", and the second he calls "imaginal leverage". The second seems to be a specific case of the first. By "perspective-alternation" he is referring to the function of,

"...reorienting the thought processes--either away from the world of perception, in upon the world of private images for inspiration or away from imagery, out upon perceptual cues for clarification. In this role negation would serve to

\[18\text{Ibid.}, \text{ p. 25.}\]

\[19\text{Ibid.}, \text{ p. 27.}\]
"certify, as it were by a ritualized gesture of self-reassurance, that one is free to stay exclusively for awhile with one's images or with one's percepts because one is free--by its agency--to leave either."

By "imaginal leverage" he refers to an individual's making use of unconscious images brought into consciousness in disbelieved form to reorient, direct, and thus enrich his conscious thought processes.

Because the present study is concerned with negation as a derivative of a defense mechanism, the writer will now attempt to clarify the relationship between the thought mechanism of negation when it is functioning as a derivative of a defense mechanism and a defense mechanism, per se. The specific defense mechanism with which it might be confused is, of course, that of denial.

Defense Mechanisms vs. Thought Mechanisms--Denial vs. Negation

Sperling\(^{20}\) has contributed greatly towards clarifying the origin and essential nature of the defense mechanism and its derivatives on various organizational levels. He traces the fundamental nature of the defense mechanism to the genesis of reality testing. In so doing he differentiates two types of rejection on the part of the primitive psychic apparatus.\(^{21}\)


\(^{21}\)Ibid., pp. 26, 27.
"Ia. NOT THIS externally stimulated, real unsatisfying perception exists, which I reject;

b. BUT THIS other internally stimulated, imagined, pleasurable perception exists, to which I return.

IIa. NOT THIS externally stimulated, real, unsatisfying perception is need-satisfying, which I reject as meaningless;

b. BUT THIS other internally stimulated, imagined, pleasurable perception is need-satisfying, to which I return as meaningful."

He states,

"Numerous experiences of these patterns of rejection of perception (Ia and IIa) give rise to the basic mechanisms of defense. The primitive conscious or preconscious rejective processes undergo distinctive metapsychological changes in the course of their incorporation. In becoming unconscious this dynamism serves to prevent access to consciousness of objectionable unconscious impulses striving for conscious representation and discharge. A conscious, after-expulsive perceptual pattern, with or without its affective cathexis, thereby becomes a sustained, rejective dynamism organized in the unconscious ego—the familiar mechanism of repression."

Sperling then suggests that a defense mechanism should denote only psychopathology and that it should denote only "countercathetic activity of the unconscious ego", and "that it reflect only one distinctive, though pathological,

22 Ibid., p. 25.
mode of the attempted integrative functioning of an organized ego in a relatively well differentiated psychic apparatus."

Sperling then introduces his concept of ego countering activities as a means of clarifying primary and secondary defenses.23

"The alternative or 'This Other' component of the formula (Ib or IIb), that part which 'supports' the initial rejection, may operate according to either the pleasure (Ib or IIb) or the reality principle, depending upon the ego's acceptance of the re-established internal image in lieu of or as a guide to the rediscovery of the need-satisfying object in the outer world. The complete 'NOT THIS BUT THIS OTHER' formula (a + b) can be considered as the prototype of what I would call countering types of defense mechanism."

"This distinction provides a basis for classifying the most fundamental defense mechanisms. The rejective component (NOT THIS) is represented by repression and denial, while the countering component (NOT THIS BUT THIS OTHER) is the prototype for other fundamental defense mechanisms such as isolation, reaction formation, and projection."

"In the countering class of defense the primary component (repression) is supported by the provision of a substitute cathetic outlet. By and large the countering category comprises the overwhelming majority of defenses seen clinically."

Sperling classifies the countering defenses on the basis of Anna Freud's description of the various types of denial.24

23Ibid., p. 29.
24Ibid., p. 34.
"The categorizing of these preliminary defensive stages as denial (a) in fantasy, (b) in word, and (c) in act, provides a basis for the consideration of their subsequent development. More complex and specific forms of countering defenses evolve from these with the correlated development of the child's age. The displacement of the denied cathexis to the imagination results primarily in excessive fantasy and pseudologia as the expression of defense. Where word and thought substitution predominates, isolation, rationalization, and projective types of countering defense develop. Where the acting form predominates, the defenses of undoing, reaction formation inhibitions, displacement activities, and complex acting out result. The countering defenses have the model NOT THIS-BUT THIS OTHER impulse, aim, object, image, thought, attitude, or act."

Sperling discusses the rather broad concept of denial, and categorizes the types of denial on different organizational levels as follows: 25

"(1) That rejecting the existence of an external perception—the psychotic type of denial;"

"(ii) That rejecting the meaningfulness only of an external perception—affective or neurotic denial;"  
\[Denial as a defense mechanism\]

"(iii) That rejecting the validity or justification of an assertion or statement—the type of 'denial' manifested by defensive thinking, of 'negation on a higher level' (rationalized negative judgment);"  
\["Denial" as a thought mechanism\]

"(iv) That rejecting the validity or justification of a charge or accusation, whether provoked or

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25Tbid., p. 33.
merely projected (projection type of denial)."

Sperling states that confusion concerning the concept of denial as a defense mechanism lies in the failure to recognise its attributes as a defense mechanism, namely that it is an activity of the unconscious mind, that the source of the dangerous stimuli is external, that the rejection of the stimuli is incomplete, and is directed at only the meaning of the stimuli, and that it occurs in a differentiated, organized ego.

It might be said then, that denial, as a defense mechanism is a rigid, automatic, unconscious process that is directed against the meaning of certain external stimuli and is usually associated with other countering defense mechanisms. From the experimenter’s viewpoint denial is inferred from either certain omissions in responding and/or certain commissions in responding (i.e. inferred from the observed countering defenses,) in relation to external stimuli.

Negation, on the other hand, is a more flexible, controllable, conscious thought process that is directed against either certain internal or external stimuli, and is also usually associated with other countering thought processes. From the experimenter’s viewpoint, it is observed from certain commissions in verbal responding in relation to either internal
or external stimuli.

It is proposed that negation functions not only as a higher level substitute for repression, but also, as implied above, as a higher level substitute for the defense mechanism of denial. That is, negation serves as a high level substitute for any unconscious excluding or going-against (counter-cathetic) ego process.

Negation vs. Isolation

Freud has explicitly stated that when an instinct-presentation is repressed, the idea and the affect or energy attached to the idea may undergo different fates. In the quotation on page 3, he stated that negation allows only the idea into consciousness, and not the affect or energy. This separation of idea and affect, allowing either one or the other into consciousness is characteristic of the defense mechanism of isolation which Freud formulated in his "The Problem of Anxiety". Thus Rapaport feels that the "thought-process of negation implies the defense of isolation."

Sperling classes isolation as one of the prominent defenses in individuals who use words and thoughts rather

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than actions as substitutes for material that is repressed or denied. It would seem to follow then that individuals who predominantly use word and thought substitution rather than action substitution would have developed a greater facility in separating affect and idea for purposes of more highly integrated forms of adaptation (defense or expression). Thus an individual who extensively uses the thought mechanism of negation, a high level isolating mechanism, is probably one who also makes extensive use of the lower level isolating defense mechanism. The present writer is thus proposing the idea that there is a certain consistency in the format of ego functioning on the various psychic levels of organization. Clinically, one might therefore look for persons with predominant "obsessive" structural emphasis (who characteristically use the defense mechanism of isolation) as making more extensive use of negation than those persons of predominant "hysterical" emphasis. In developing the concept of negation, it is probably no accident that Freud cites the obsessive personality in giving a clinical example of the concept. The reader will also recall that Freud refers to his often "defeating the negation" of a patient during an analysis while being unable to remove the repression.

29"Negation", op. cit., p. 181.
This tendency towards only intellectual insight is a well established characteristic of the obsessive personality type. The emergence of the semantic "no" coincides with the "anal" period of psychosexual development. It would seem reasonable that persons who are fixated largely on this level (such as the obsessive personality) might tend to make extensive use of the mechanism of negation in their thinking.
The thought mechanism of negation has been discussed as a function that an individual evokes at will in coping with life situations. The most important clinical and experimental question at the present time is: Can an individual be induced to assume a negation response set? That is, in a controlled stimulus situation, can the experimenter generally procure dynamically important responses from a subject by asking him to assume a seemingly senseless and rather difficult attitude towards certain stimuli? If the answer to this question is generally "yes", then psychology would have at its disposal a clinical and experimental device which would provide rapid access to an individual's ego dystonic mental content. The value of such a device for purposes of theory building, clinical diagnoses, and treatment seems clear.

In connection with this question, Freud has stated, "There is a most convenient method by which one can sometimes obtain a necessary light upon a piece of unconscious and repressed material. 'What', one asks, 'would you consider was about the most unlikely thing in the world in
this situation?" Rapaport makes the following comment on this statement by Freud:

"The aim of this question is to create the same psychological situation as the one which prevails when a 'negation' spontaneously arises. It attempts to arouse forces that would 'negate' the drive-representation as soon as it rises to consciousness, and thereby to obviate the danger of its being acted on, which is the reason for repressing it. This example clearly illustrates that negation is a significant aspect of the thought-process. It shows how communication can play a dynamic role in thought organization: the question permits a loosening of repression by preparing the ground for negation."

The following studies have attempted to invoke a negation response set in "normal" subjects under controlled stimulus conditions with the aim of eliciting ego dystonic material such as would be predicted from the theory of spontaneous negation.

Studies on Invoked Negation

R. Jones administered five TAT cards to eleven persons who were in "psychoanalytically oriented" therapy. Each subject gave five stories in response to the standard TAT instructions, and then gave five more stories in response

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30 Loc. cit.
to negation instructions. ("What is the most unlikely theme this picture might represent?") The five therapists were then asked to judge which of the two stories on each of the five cards "more lucidly suggests this patient's repressed psychic content as you know it?" The negation story was rated as more suggestive of the patient's repressed psychic content in 46 of 55 pairs of stories.

Slack\textsuperscript{33} conducted interviews with ten Harvard and Radcliffe undergraduates. Each interview was divided into two parts of ten minutes each. During the first ten minutes a subject was instructed as follows: "I should like to have you tell me some things about yourself." During the second ten minutes the subject was given a negation instruction: "I would like to have you tell me things about yourself which couldn't possibly be true, which are the last things in the world which could be true about you...." Ten judges were asked to rate the protocols with twenty-three items descriptive of specific aspects of personality. It was found that negation protocols, as predicted, were rated with significantly more items related to "aggression, depth of material, impulsiveness, openness of expressions of

feelings toward authority figures, childishness, and degree of 'disturbed' behavior."

In another study using the word association technique Jones administered forty stimulus words, twenty of which had been taken from Rapaport's list of "traumatic" words. To his group of thirty Harvard undergraduates he administered them first under regular WAT instructions and then under negation instructions. He then asked each subject to recall the stimulus word when presented with the word that he had given as a response under both regular and negation sets. In testing the theoretical implication that the negation set tends to neutralize repressed ideational derivatives, Jones predicted that there would be no difference in recall efficiency between the "traumatic" and "non-traumatic" words with responses elicited under negation instructions. Jones predicted that under regular instructions "traumatic" words would be less efficiently recalled than "non-traumatic" words. The results were as predicted. However, recall efficiency with the negation responses was generally poorer than recall efficiency with the responses elicited under regular instructions.

Grieve\textsuperscript{35} administered a 50 item word association test to 62 Boston University undergraduates under three types of instructions—regular instructions, social or "faking" instructions ("...respond...with one other word which most other people would respond with."), and negation instructions. As predicted the negation responses were found to embody significantly more "hostility", "sexuality", and "infantility" than both regular and social responses. In addition, the social responses were judged as the least primitive to a significant degree.

\textbf{Evaluation of the Studies}

The above studies indicate quite clearly that an invoked negation response set serves to elicit responses that differ markedly from responses obtained from other kinds of invoked sets; this difference is generally in the direction of more primitive responses, which is of course exactly what the theory would predict. But, in all the above cases, it is not nearly so clear that these more primitive responses represent ego dystonic and therefore repressed or inhibited dynamically relevant material.

One wonders whether or not the above results could be explained without invoking the concept of negation. For

example, consider the following alternative explanations:

1. Isn't this exactly the type of material that we might expect from such unorthodox or "crazy" instructions? If a person is asked to act crazy, which perhaps is what such instructions imply, then he certainly will give responses that are in line with his conception of what "crazy" means. Or a subject might react to such "unreasonable" instructions by simply giving "unreasonable" responses. Responses that are viewed in this light do not necessarily have to be connected with ego dystonic material.

2. Could not the greater incidence of aggressive responses be explained to some extent as a reaction to a task that generally seems meaningless and therefore becomes frustrating?

3. In the word association test some stimulus words tend to elicit words as responses with opposite meanings, and in some cases these opposite meanings could be interpreted as more primitive. (e.g. church-devil, good-evil, etc.)

4. Negation instructions tend to elicit responses in the word association test with an apparent less obvious relationship to the stimulus. The responses tend to fall into Rapaport's category of "distant" responses.
Is it not reasonable, and perhaps more parsimonious, to explain poorer memory of these responses on the grounds that they are lower on the associative response hierarchy with consequent weaker associative bonds?

In light of these possible alternative explanations, it would appear that Jones' TAT study would have been more convincing if his therapists had been asked to decide between the negation stories of two individuals in addition to deciding between the regular and negation story of the same individual.

Both Slack's study and Grieve's study would also have been improved if they had compared their negation responses with an independent measure of an individual's ego dystonic processes.

This writer, in a pilot study, was not able to duplicate Jones' result of equal efficiency in recall of "traumatic" and "non-traumatic" WAT stimulus-response items when the called-for memory response was the subject's original response rather than the stimulus word. In addition, Jones' implicit assumption that negation responses to "non-traumatic" words are less ego dystonic than negation responses to "traumatic" words, is open to serious question. A cursory examination of a few protocols suggested to this writer that
the assumption probably does not hold. It therefore seems that Jones' design was such that the specific question that he was endeavoring to test could not clearly be answered. His results do suggest, however, that the negation set is effective in eliciting primitive-appearing responses from "non-traumatic" stimulus words as well as from "traumatic" words. His result of equal efficiency in recall suggests further that the responses from the two types of words are approximately equal in their degree of ego dystonicity.
CHAPTER III

HYPOTHESES

After a consideration of the concept of spontaneous negation and after a consideration of the four recent studies that were concerned with invoked negation, it becomes clear that it still remains to be demonstrated that the concept of negation is the most parsimonious explanation of the responses that result from an invoked negation set. Thus, the central question that still remains to be answered is: Does the negation set, that the experimenter invokes by instructions, tend to lessen ego censorship and thus provide a possible avenue for ego dystonic material (painful material ordinarily associated with a defense mechanism) to enter consciousness in order to serve ego syntonic (consciously acceptable) aims? That is, can the experimenter invoke an attitude in a subject that will force him to call forth the ordinarily spontaneous thought mechanism of defensive negation?

Consider a laboratory situation in which an experimental stimulus refers to both painful and neutral verbal material. In addition suppose that an individual tends to inhibit the painful material and favor the neutral material in responding to the stimulus under conditions of an invoked affirmation response set. If it is possible to invoke an attitude in a
subject that will force him to call forth the ordinarily spontaneous thought mechanism of defensive negation, then the following would hold:

Hypothesis One

The response probability of painful verbal material that is associated with the defense mechanism of simple inhibition will increase when an invoked affirmation set is altered to that of an invoked negation set.

It should be emphasized that the condition underlying this statement is that the subject, under ordinary conditions of an affirmation response set, tends to avoid expressing (defend against) this painful material because of ego censorship (countercathexis), thus preferring the expression of neutral material; however the painful material necessarily exerts a certain "push" towards expression in reaction to a stimulus referring to the material. If the "counter-push" or censorship (defense mechanism) becomes temporarily obviated via the negation set, then the expression of the censored material becomes more likely than it was under non-negation (affirmation) conditions.

If the painful and neutral verbal material described above is composed of single words, then in general the degree of availability to conscious expression of single words should not only be reflected in terms of quantity of words
elicited (probability of being elicited), but should also be reflected in terms of the elapsed time between the initiation of the stimulus and the resulting response. This leads to the following hypothesis:

**Hypothesis Two**

a. Under an invoked affirmation set, individuals who respond with less painful verbal material than neutral verbal material will also show in general longer reaction times in connection with the painful verbal material as compared with neutral verbal material.

b. These same individuals will show in general a differential decrease in reaction time with painful verbal material as compared with neutral verbal material, from the affirmation set to the negation set.

In general, with individuals who tend to inhibit painful material, the degree of availability to conscious expression of this painful verbal material should also vary inversely with their degree of painfulness. This leads to the following hypothesis:

**Hypothesis Three**

Under an invoked affirmation set, individuals who respond with less painful than neutral verbal material, will in general respond with painful material with a low degree of painfulness.

(A corollary hypothesis under a negation set is not indicated at the present time, because little is known as to how much anxiety or painfulness the negation mechanism obviates.)

It will be recalled in the earlier theoretical discussion of isolation and negation that the thought mechanism of negation
probably implies the defense mechanism of isolation. It was also suggested that isolation is one of the prominent defenses in individuals who use words and thoughts rather than actions as substitutes for material that is repressed or denied. It was thus suggested by the writer that there is a certain consistency in the format of ego functioning on different organizational levels. Individuals who use predominantly word and thought substitution rather than action substitution will have developed a greater facility in separating affect and idea for purposes of more highly integrated forms of adaptation (defense or expression) such as using the thought mechanism of negation. If the above thesis is correct then an individual who makes extensive use of negation, implying a substitution of word and thought rather than action, (as per Sperling's third level of denial—"that rejecting the truth of an assertion or statement--the type of 'denial' manifested in defensive thinking, of 'negation on a higher level' (Rationalized negative judgment)" see page 17) will also tend to utilize a lower level of defensive negation, such as that of negating single painful words that have little importance in determining the individual's concept of self. Of course this lower level of defensive negation in turn implies a still lower level defense mechanism. The reader will recall the distinction between a thought mechanism
and a defense mechanism.

This leads to the following hypothesis:

**Hypothesis Four**

Individuals will show consistency in the extent that they utilize the following three ascending levels of defensive verbal behavior: (1) Defense mechanism of simple inhibition in conjunction with painful verbal material. (2) A low level thought mechanism of negation in connection with the same painful verbal material, and (3) A high level thought mechanism of negation in the form of general defensive thinking.
CHAPTER IV

METHODS AND PROCEDURE

A. OPERATIONAL DEFINITIONS OF THE VARIABLES IN THE HYPOTHESES

Operation Definition of Painful Verbal Material

Painful verbal material is defined as nonsense syllables associated with electric shocks after the syllables have been learned to a given criterion. Neutral verbal material is defined as nonsense syllables learned to an identical criterion without later associated electric shocks.

Operational Definition of Degree of Painfulness

Degree of painfulness is defined as the number of shocks associated with a specific nonsense syllable.

The rationale for equating degree of painfulness with number of shocks is mainly empirical. Harwood (see page 41) did so, and his results were as predicted. However, the writer in a preliminary study was not able to duplicate Harwood's results. The present design thus includes this element mainly as a further attempt to approximate Harwood's results.

Operational Distinction Between the Defense Mechanism of Simple Inhibition and the Thought Mechanism of Negation

It will be recalled that in Chapter I a distinction was
made between the defense mechanism of denial and the thought mechanism of negation. The defense mechanism of simple inhibition will now be distinguished from the thought mechanism of negation. The defense mechanism of simple inhibition is a rigid, automatic, unconscious process that is directed against certain painful internal stimuli. The thought mechanism of negation is a flexible, controllable, conscious—and thus a higher level—process that is also directed against certain painful internal stimuli which are associated with a previously established more basic defense mechanism, such as, in this instance, simple inhibition.

Operationally, the defense mechanism of simple inhibition would be inferred from certain omissions in responding and/or certain commissions in responding. The thought mechanism of negation would be observed from certain commissions.

Having previously defined painful internal stimuli in terms of learned nonsense syllables associated with electric shock, we can now operationally define the defense mechanism of simple inhibition in the present experiment as—the tendency of a subject, in response to certain instructions from the experimenter (affirmation instructions), to respond with a minority of nonsense syllables that were previously
associated with shock. (The defense mechanism is inferred from omissions in shock-associated syllables.) Subjects who respond in the experiment about to be described with a minority (less than 10) of shock-associated syllables under affirmation instructions will henceforth be called Group A subjects. Subjects who respond with a majority (more than 10) of shock-associated syllables under affirmation instructions will be called Group B subjects.

The operational definition of the thought mechanism of negation is—the tendency of the same subject, in response to altered instructions from the experimenter (negation instructions), to respond with a greater number of shock-associated nonsense syllables—while preceding all his nonsense-syllable responses with the verbal response of not. (The thought mechanism is observed from commissions of shock-associated syllables, and also from the verbalization of the word "NOT".)

The specific syllables that a subject elicits in response to affirmation instructions (in the experiment about to be described) are determined by an illusion, for he thinks incorrectly that the syllables are being written with the light. He is thus unconscious of the fact that his choices are determined by way of his internal mental processes, and that external stimuli are actually not playing a part in his
decisions. The specific syallables that he elicits in response to negation instructions, however, are not determined by an illusion. He is conscious of the fact that he is making a choice, in each instance, among a number of syllables that he willfully calls forth from memory. Thus, in this sense, the negation responses are consciously determined and they tend to be more controllable and flexible. The affirmation responses, in contrast, are unconsciously determined and they tend to be more rigid and automatic.

Operational Definition of Defensive Thinking

The degree that an individual uses defensive thinking ("...rejecting the truth of an assertion or statement... 'negation on a higher level' rationalized negative judgment..." see page 17.) is defined in terms of his raw score on the 30 item K scale of the Minnesota Multiphasic Personality Inventory.

In describing the K scale in the MMPI manual Hathaway and McKinley state, "A high K score represents defensiveness against psychological weakness, and may indicate a defensiveness that verges upon deliberate distortion in the direction of making a more 'normal' appearance. A low K score tends to indicate that a person is, if anything, overly candid and open to self criticism and the admission of symptoms even thought they may be minimal in strength."36 An examination

36S.R. Hathaway and J.C. McKinley, Minn. Multiphasic
of the statements comprising the \(K\) scale reveals that they generally refer to mild personality weaknesses that tend to be true of almost everyone. It is truly a negation scale in the strict operational sense because the \(K\) score (with one exception) is the sum total of only the "negations" or the statements that are marked false.

A detailed discussion of the \(K\) scale is presented in Appendix C. The following ideas are presented and discussed:

1. \(K\) is negatively correlated with most of the MMPI scales. The highest negation correlations are with scales \(F_t\) and \(S_c\). The two exceptions are the \(H_y\) and \(P_a\) scales which are positively correlated.\(^{37,38}\)

2. \(K\) is not related to age or intelligence.\(^{39,40}\)

3. \(K\) is positively related to socio-economic status.\(^{41}\)

4. \(K\) is positively related to size of home town.\(^{42}\)

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\(^{39}\) P.E. Meehl and S.R. Hathaway, "The \(K\) Factor as a suppression variable in the Minnesota Multiphasic Personality Inventory", J. Applied Psych. (1946), 30; p. 548.


\(^{41}\) Meehl and Hathaway, op. cit.

\(^{42}\) Schmidt, op. cit.
5. There is some disagreement as to whether $K$ is an indication of ego defensiveness,\textsuperscript{43} or good adjustment,\textsuperscript{44,45} for $K$ is highly correlated with various scales measuring social adjustment.

6. $K$ is positively related to suggestibility, for it is positively correlated with the quantity of hypnotically-induced dream symbolism. It is also positively correlated with dream symbolism in the "no-feeling" category, and is negatively correlated with dream symbolism in the "extrapunitiveness" category.\textsuperscript{46}

7. Males generally obtain higher $K$ scores than females.\textsuperscript{47}

8. A high $K$ score cannot be explained by Berg's deviation hypothesis.\textsuperscript{48,49}

\textsuperscript{43}Wheeler et al, \textit{op. cit.}

\textsuperscript{44}A. Sweetland and H. Quay, "A note on the $K$ scale of the Minnesota Multiphasic Personality Inventory", \textit{J. Consult. Psych.} (1953), 17, p. 314.


\textsuperscript{46}Sweetland and Quay, \textit{op. cit.}

\textsuperscript{47}McKinley et al, \textit{op. cit.}


A reliable and valid shortened (20 item) form of the Taylor Manifest Anxiety Scale was combined with the K scale to make an inventory of forty-seven statements. (Three statements were common to both scales--hence a total of only 47 statements.) The TMA scale was added for two reasons. In the first place it was immediately useful in providing filler items for the K scale. Secondly, in psychoanalytic theory the concepts of anxiety and defense are intimately related, such that defenses are said to come about as attempts to diminish conscious anxiety. Thus it would seem that we would have further evidence that the K scale is measuring defensiveness if we found that individuals scoring high on the K scale were those who score low on the anxiety scale, and vice versa.

B. EXPERIMENTAL DESIGN

Harwood's Technique

The technique will be similar to that used by Harwood. Harwood had his subjects learn ten nonsense syllables to a criterion of two correct serial repetitions. He then informed them that the experiment was for the purpose of testing

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memory under stress. He then had the S's write the list of ten syllables ten times and informed them that they would be shocked randomly while doing so. Actually E shocked the syllables systematically—two syllables were shocked zero times, two—one time, two—two times, two—four times, and two—six times. Twenty four hours later E exposed his S's to an autokinetic light and informed the S's that E was going to test their visual acuity by writing the syllables (with the light) that they had learned twenty four hours earlier. (Actually the light remained stationary throughout.) S's tended to respond with the "low shock" syllables (shocked zero or once) significantly more than they responded with the "high shock" syllables (shocked four times and six times). The median number of "high shocked" syllables reported was 3.5; the median number of "low shocked" syllables reported was six. (Out of 40 trials, each trial lasting thirty seconds.)

Rationale for Using Harwood's Technique

This experiment has at least three aspects to recommend it for our purposes:

1. Since the stimulus remains stationary it is completely ambiguous. The responses elicited are thus totally dependent on the subject's set. This is ideal for our purposes because our independent variable in studying
negation is set.

2. We have defined the defense mechanism of simple inhibition in terms of an individual's tendency to avoid responding with shocked nonsense syllables. The results of the above experiment show that shocked syllables tend to be avoided as responses in the autokinetic situation.

3. A preliminary experiment by Mednick, Harwood, and Wertheim\textsuperscript{52} provides a good argument in support of the assumption that painful material, as defined by the insertion of shock in the laboratory, is handled by a subject (at least in the autokinetic situation) in much the same way as painful material that is defined by "complex indicators" on the word association test. That is, Harwood found that Kent Rosanoff test words associated with "complex indicators" were "seen" as being written by the autokinetic light less frequently and with greater latencies than were "neutral" words. The "complex indicator" is a widely accepted clinical method of pinpointing conflictual or painful material. Thus because of Harwood's similar results in the autokinetic situation with shocked words and "complex" words, it would seem that we have a

legitimate argument for using experimental shock as our method of defining painful material.

The Experiment

Session One

Part I:  S is first asked to mark true or false to each statement of a 47 statement inventory which is composed of the 30 item MMPI K scale and a 20 item shortened form of the Taylor Manifest Anxiety scale. E then has S learn two lists of six nonsense syllables by the method of serial anticipation to a criterion of three correct serial repetitions.

Part II:  E then tells S that this is an experiment to test memory under stress. S then writes the first list of six syllables fifteen times, and while so doing he is at times administered an electric shock to his wrist. S is told that the shock is administered randomly. Actually E shocks all six syllables systematically in varying amounts in accordance with a prearranged schedule. Three syllables are shocked twice, and three are shocked eight times. S then writes out the other list of six syllables fifteen times without any accompanying shock. At the end of the session E rates S on S's degree of disturbance while being shocked.

Session Two

At a second session twenty-four hours later S is asked to recall as many as possible of the twelve syllables that he learned 24 hours earlier. If he does not recall all of them, he is given a list of syllables and asked to refresh his memory. E then informs S that this time E is studying a certain type of visual acuity in which the Air Force is interested. S's eyes are then examined by a standard eye chart. S is blindfolded and led into a completely darkened room. Upon removing the blindfold S is exposed to a small light. S is informed that E is going to write the twelve syllables that he learned the day before by means of moving the light through space. (The light, of course, actually remains stationary.) S is informed that the syllables will
be written in no definite order and that some will be repeated more than others. S is instructed that as soon as he sees a syllable being written, he should tell E which one it is. There are 20 trials during which the light is turned on for no longer than forty-five seconds during each trial. (As soon as S sees a word, this of course ends that particular trial and the light is automatically turned off.) S thus elicits twenty responses under the above "affirmation" set.

S is then given a rationale to make his assuming a "negation set" seem reasonable. S is told that because of the difficulty of the task he was probably uncertain of some of the syllables that he reported, and that in many instances he could probably have been more certain of which one of the twelve syllables was most likely not being written during a particular trial. S is further told that the Air Force is interested in this type of uncertainty. For example a pilot may be uncertain as to the specific identity of another plane, but he may be more certain that the plane is not an enemy. It is crucial for him to recognize the plane as not being an enemy--because this may be all that is needed to save either his life or the life of his friend--even though he is less certain of which of the friendly planes it actually is.

E then tells S that, in accordance with studying the above kind of uncertainty, S should report during each trial a syllable that is definitely not being written or one that is most likely not being written. There are 20 trials under this "negation set".

As the autokinetic light is turned on, at the start of a trial, an electric stop-clock is also started. The S responds with a syllable into a microphone which turns off the light and at the same time stops the clock. The response latency is then noted. If S does not elicit a response, the light is automatically turned off after 45 seconds. If S does not respond with a syllable in 45 seconds he is asked to take a guess.
C. RATIONALE FOR VARIOUS ASPECTS OF THE DESIGN

Memory of Syllables after Twenty-Four Hours

The design calls for a memory test twenty-four hours after the twelve nonsense syllables were learned. This is included in order to relate the variable of memory with the variable of simple inhibition.

The defense mechanism of secondary repression is very often studied in the laboratory in a similar manner—that is, by inducing anxiety in connection with previously neutral material, and, after a period of time, noting the omissions in memory of the anxiety material verses other neutral material, and then relating this tendency to forget anxiety material to other variables. However, in the present study, secondary repression is not the defense mechanism in which we are most interested. We are primarily interested, rather, in the defense mechanism of simple inhibition. The main difference between the two mechanisms is that in simple inhibition the painful material generally can obtain conscious expression in the absence of competing neutral material; whereas, in secondary repression, the painful material generally cannot obtain conscious expression in the absence of competing neutral material.

The present design calls for an individual, upon entering the autokinetic situation, to have all of the twelve syllables
above his threshold of memory. If this were not provided for, then an individual's favoring the neutral syllables in the autokinetic situation might have any of three explanations—secondary repression, simple inhibition, or simply poor memory. Thus the reader will understand why it was necessary to have every subject, who recalled less than twelve syllables, refresh his memory by looking at a random list of the twelve syllables at the beginning of the second session. The defense mechanism of simple inhibition thus becomes the most reasonable explanation for an individual's responding with a minority of shock-associated syllables under the affirmation set.

**Rationales for Autokinetic Word Technique**

The autokinetic word technique was first introduced by Rechtschaffen and Mednick\(^{53}\) as a means of eliciting words and sentences from subjects in the study of their "nonthomous" (not rooted in the objective, and thus definable, characteristics of a stimulus) "perceptions". It was further used by Mednick, Harwood, and Wertheim\(^{54}\) in showing that "disturbing" Kent Rosanoff stimulus words, as defined by responses of low probability and high latency on the Kent Rosanoff word association test, were perceived as being


\(^{54}\)Mednick et al, op. cit.
written by the autokinetic light with greater latency and less frequency than were "neutral" words. The technique was again used in the above-mentioned study by Harwood. 55

The technique is ideal in making an individual directly expose his intra-psychic verbal processes without his realizing that he is doing so. Since the light stimulus has no objectively definable motion characteristics, all "perceptions" of movement in the form of nonsense syllables by a subject have to be conceived as the product of his general response set acting upon his internal organization of the recently acquired nonsense syllables. The resulting perceived organized movements of the stationary light might be considered as pure projective phenomena, since the usual projective test stimuli have some degree of objective structure.

D. SELECTION OF NONSENSE SYLLABLES

The twelve nonsense syllables were selected from Glaze's 56 list of 20% associative value. In general, the lower the associative value of a syllable the less likely the syllable will represent a meaningful word to a particular individual. However, it was found in the present study that syllables of zero associative value involved too much learning time. This

55 Harwood, op. cit.

particular associative value was used because it represented a compromise between the above two considerations.

The criteria used in selecting the twelve syllables were that each syllable should begin with a unique letter and each should end with a unique letter in order to minimize the degree of similarity among the syllables. In addition all five vowels were used, each vowel being used twice, with the exception of a which was used four times. Thus the following two lists of six syllables were chosen and presented for learning in the order indicated below. It will be noted that the relative position of the vowels for the two lists are identical.

<table>
<thead>
<tr>
<th>List J</th>
<th>List S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. JAT</td>
<td>SAJ</td>
</tr>
<tr>
<td>2. ZOR</td>
<td>GOK</td>
</tr>
<tr>
<td>3. BEH</td>
<td>FEP</td>
</tr>
<tr>
<td>4. QAM</td>
<td>KAZ</td>
</tr>
<tr>
<td>5. LUY</td>
<td>HUQ</td>
</tr>
<tr>
<td>6. TIV</td>
<td>GIW</td>
</tr>
</tbody>
</table>

E. CONTROLS SEPARATING POSSIBLE CONTAMINATING VARIABLES ARISING FROM THE BASIC DESIGN

There are some possible contaminating variables that could arise from the experimental design. These possible variables will not be stated after which the appropriate control for each will be described.

Order vs. Part I and Part II: The possibility that the order in which the two lists were learned in Part I might
have a differential effect on their degree of learning or inhibition, and likewise, that the order in which the two lists were written in Part II might have a differential effect on the degree the two lists were overlearned was controlled to some extent by always reversing the learning order in Part I and the writing order in Part II.

Order vs. Individual List: The possible influence of order of learning on the degree of learning or inhibition and the possible differential effect of the unique characteristics of a given list on learning was controlled by having half the subjects learn list J first and having the other subjects learn list S first.

Shock vs. Order vs. Individual List: (1) The possibility that the order in which the two lists are shocked (Part II) might have a differential effect on their degree of learning or inhibition was controlled for by administering the shock with the list that was written first with half the subjects, and on the list that was written second with the other half. (2) The effects of shock vs. the differential effects of the two lists were controlled for by administering shock to list J with half the subjects, and administering shock to list S with the other half.

In summary, then, there are two basic orders of learning and writing in Parts I and II, and two basic orders of shock
for each learning order in Part II, thus making a total of four different orders of presentation.

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. S J</td>
<td>J S</td>
</tr>
<tr>
<td>2. J S</td>
<td>J S</td>
</tr>
<tr>
<td>3. S J</td>
<td>J S</td>
</tr>
<tr>
<td>4. J S</td>
<td>J S</td>
</tr>
</tbody>
</table>

High Shock--Low Shock vs. Individual Syllables: The effects of differential shock-frequency vs. the effects of the individual syllables were controlled as follows: With half the subjects, syllables in positions 1, 3, and 5 were associated with eight shocks while being written, and syllables in positions 2, 4, and 6 were associated with two shocks. With the other half of the subjects the positions of the high frequency shock and the low frequency shock were reversed.

Order of the Affirmation and Negation Sets: The effects due to response set were separated from the effects due to order of set by invoking the affirmation set first with half the subjects, and invoking the negation set first with the other half.

F. PREDICTIONS

Having operationally defined the variables embodied in the four hypotheses, and having described the experiment embodying the operations, we are now in a position to restate the hypotheses in the form of predictions.
Prediction One

Under negation instructions Group A subjects will respond with an increased number of shock-associated syllables. This general increase will be greater than any general increase or decrease of shock-associated syllables occurring with Group B subjects.

One could argue that a subject who elicits a minority of shock-associated syllables under affirmation instructions would naturally tend to elicit more of these shock-associated syllables under negation instructions due to the phenomenon of regression towards the mean. That is, if the eliciting of a minority of shock-associated syllables under affirmation instructions is not due to a defense mechanism but is due rather to chance occurrence, then the chances are that this deficit would be made up during the next period of responding under negation instructions, and vice versa. The reader will thus understand why it was necessary to include this chance factor in the latter part of the above prediction. If the predicted increase in shock-associated syllables with Group A is due to chance, then we would expect a similar decrease in shock-associated syllables with Group B subjects.

Prediction Two

a. Group A subjects will show in general longer reaction times in connection with shock-associated syllables as compared with non-shock-associated syllables.
b. Group A subjects will show in general a **differential decrease** in reaction time with shock-associated syllables as compared with non-shock-associated syllables, from affirmation instructions to negation instructions.

**Prediction Three**

Group A subjects will in general respond with more syllables that were associated with two shocks as compared with syllables that were associated with eight shocks.

**Prediction Four**

a. Group A subjects will tend to obtain higher MMPI K scores than those obtained by Group B subjects.

b. There will be a negative correlation between the MMPI K score and the number of shock-associated syllables elicited in reaction to affirmation instructions.

c. There will be a positive correlation between the MMPI K score and the differential number of shock-associated syllables elicited from affirmation instructions to negation instructions.

The "differential number" in Prediction 4c is computed by subtracting, in each case, the number of shock-associated syllables elicited in response to negation instructions from the number of shock-associated syllables elicited in response to affirmation instructions. The amount of increase of shock-associated syllables from affirmation to negation is a measure of the extent an individual is utilizing the thought mechanism of negation.
G. EXPERIMENTAL SAMPLE

There were 48 paid male volunteers who participated in the study. They were recruited during the second six-week summer term at Boston University. They were each paid two dollars at the end of the two experimental sessions. They were recruited by two methods: Approximately one quarter of the subjects were obtained by the writer's asking for volunteers in the classroom from courses in elementary psychology, sociology, and human relations. The other three quarters were obtained by approaching them individually in the cafeteria while they were eating their lunch.

The 48 males ranged in age from 19 to 43 with a median age of 25. Sixteen were graduate students, fourteen were seniors, ten were juniors, six were sophomores, and two were freshmen.

Considerably more than 48 subjects were recruited because many did not keep the appointment for the experiment. Approximately seventy percent did keep the appointment. There was only one subject who did not return for the second session after having participated in the first session. In addition one subject had to quit during the first session because he became very disturbed while being shocked.

H. APPARATUS

The apparatus for the first experimental session con-
sisted of a small room (7' x 7') housing a table and two chairs. The experimenter and subject were seated, facing each other, on opposite sides of the table. There was a board approximately 10" high situated at the center of the table and extending over the length of the table. This board was inserted for the purpose of concealing the shocking apparatus from the subject and for the purpose of concealing the experimenter's operations of pressing the shock button and recording data and observations.

A Gerbrand memory drum was situated directly in front of the subject. The two lists of six nonsense syllables, typed on white paper, were pasted on the rotating drum. Each list was typed side by side in two orders— one order being the reverse of the other and upside down in relationship to the other. The subject could see only one syllable at a time of a given list through the window of the memory drum. The experimenter, however, by looking through a window on the back of the drum could see the same list, originally written upside down and in reverse order, but now appearing to the experimenter right side up and in the same order as the subject's list. The lists were spaced in such a way that when the subject saw the first syllable in the list in his window, the experimenter saw the second syllable in the list, etc. This setup was used because it
made for more accurate recording during the learning process, since the serial anticipation method of learning was used. A subject's verbal response, denoting the syllable that he expected would appear next in order, was recorded as correct if it occurred while the syllable was showing in the window seen by the experimenter.

The six syllables in a given list were exposed to the subject for a duration of $2\frac{1}{8}$ seconds each. The time between syllables was $\frac{1}{8}$ second. The time between lists was 9 seconds.

A Harvard Inductorium which was concealed from the subject's view was situated on the experimenter's side of the table. The inductorium received its power from two-1$\frac{1}{2}$ volt dry cells arranged in series. The inductorium was operated by a push button. The intensity of shock was regulated by moving the coil of the inductorium in and out of a soft iron core. The position of the coil along an equal-interval scale of measurement could be recorded, thus giving a crude indication of the intensity of shock. Two dimes were sandpapered and sodered onto two wires in the circuit. The dimes were attached to a leather strap which in turn was fastened onto the subject's wrist so that the dimes were on either side of his wrist. The shock was therefore felt by a subject in his wrist mainly.

The apparatus for the second experimental session
(autokinetic session) consisted of another room (7' x 17') which was partitioned into two sections--7' x 12' and 5' x 7'. The room had no windows, and was made as dark as possible by attaching a weather vane to the bottom of the door, and, in addition, inserting a board flush with the door and floor during the experiment. The partition housing the autokinetic light was painted with flat black enamel, and the wall nearest to the subject was also painted black. This served to minimize reflections from the autokinetic light.

As stated above, the room was divided into two sections by a partition made of wood. A 6" x 9" hole was cut in the partition, and a 8½" x 9½" x 10½" black box, open on one side, was nailed flush to the partition, covering the hole. A 110 volt electric light socket was attached to the inside bottom of the box. A 25 watt bulb was placed in the socket. A tin can painted black (4½" in diameter and 7" high) was inserted over the light bulb flush into a circular hole ¾" deep on the inside bottom of the box. A small hole was drilled in the tin can, a piece of friction tape inserted over the hole, and a hole was made in the tape by a pin. Light from the 25 watt bulb emanating through the pin point served as the autokinetic light.

The subject was seating in a chair 8' from the partition, directly facing the light which was approximately at eye
level (4' from the ground). In back of the partition was a table and a chair where the experimenter sat. On the table were the following apparatus: A 1/4 horsepower motor, a Tim-O-Lite industrial Timer, an 110 volt electric stop clock (accurate to one hundredth of a second), a Gerbrand voice key with a microphone extending to the subject, and a writing board housing a six volt dry cell power supply, two electrical relays, and two small writing lights--one light focusing on the clock face and the other focusing on the data sheet. These apparatus were all connected in such a way as to accomplish the following operations: (See schematic diagram of the electrical circuit, Appendix A).

By touching and thus grounding the end of a wire attached to the voice key and simultaneously pressing the timer button, the autokinetic light, the motor, the stop clock, and the timer would all be activated simultaneously. At the same instant the writing lights were automatically deactivated. If the subject responded verbally with a nonsense syllable into a microphone in less than 45 seconds, then the autokinetic light, the motor, the stopclock, and the timer would all be deactivated and the writing lights would be activated. The experimenter would then note down the syllable that the subject elicited and also the time the light had been on. The experimenter would then reset
the voice key, reset the clock, and immediately start the next trial. If the subject did not respond with a syllable in 45 seconds, then the timer would automatically deactivate the light, the motor, and the stop-clock. Each trial, therefore, was no longer than 45 seconds.

The purpose of the motor was to attempt to induce the subject to form a possible idea that the experimenter was moving the light with the help of a mechanical contrivance, and also to create a uniform noise, thus making auditory stimulation constant. The motor drowned out extraneous sounds in the laboratory outside the room.

I. PROCEDURE AND RATIONALE

Session One

When the subject arrived at the laboratory he was asked to take a seat in a chair across the table from the writer. He was then asked to complete the forty-seven item paper and pencil inventory which included the MMPI K scale and a shortened form of the Taylor Manifest Anxiety scale. He was asked to read each statement and indicate whether it was true or false on the IBM answer sheet. He was told that if the statement was mostly true, he should mark it true, and if it was mostly false, he should mark it false. A subject finished this task typically in about ten minutes.

The writer then said,
"I would like to have you learn a list of six nonsense syllables by means of the memory drum which you see before you. Now, a nonsense syllable, in case you don't know, is simply a three-letter word that doesn't mean anything. The first letter is always a consonant, the second letter is always a vowel, and the third letter is always a consonant. The list of six nonsense syllables will appear, one syllable at a time, in the window of the drum. Each syllable in the list will appear in the window for a short constant duration of time until all six syllables have appeared. There will then be a short interval, after which the six syllables will again appear in exactly the same order. Your task is to gradually learn to predict the syllable that will follow the syllable you see in the window at any given time. You will call out your prediction to me when you think you know. When the next syllable actually does appear in the window this will tell you whether you are right or wrong in your prediction. Please spell the syllables out rather than trying to pronounce them, for they are sometimes difficult to pronounce. This process will continue until you have correctly predicted all six syllables in the list three times in a row. Are there any questions?"

The writer kept an accurate record of the learning process, noting which syllables were correctly predicted on each trial. After the subject had learned the list to criterion, the writer said,

"Good! Now I would like you to learn another list of six nonsense syllables in exactly the same manner."

After the subject had learned the second list, the writer said,
"Good! You learned both lists about equally well. Now please write the two lists of syllables from memory, side by side, on this sheet of paper. You will probably not remember them all, so I will tell you any that you don't immediately recall."

The subject was told that he learned each list of six syllables equally well in order to eliminate as much as possible any self-evaluations of his learning-efficiency which might lead to a feeling of inefficiency or failure in connection with one of the lists as compared with the other. Seldom did a subject learn both lists in the same number of trials. Pilot data suggested that with some subjects negative self-evaluations following the learning of one of the lists considerably slower than the other probably played a part in poorer recall of that particular list the following day.

The subject was asked to write both lists side by side so that he would be about equally familiar with both lists at the end of the learning sessions. He was told that he probably wouldn't remember all the syllables in order to eliminate any self-evaluations of failure due to his inability to recall some of the syllables.

The subject usually recalled all of the list he had just learned, but tended to block on some of the syllables in the list that he had learned first.
The writer then said,

"The purpose of this experiment is to study the effects of stress on a person's memory. This will be studied in the following way. Here is a blank writing pad (3" x 5"). I want you to print the six syllables you just learned on this pad, one syllable to a page, in the same order that you learned them. You will write the list a number of times. As you print each letter of a syllable, please say it aloud."

The subject was asked to say each letter aloud in order to condition by means of the shock both a verbal response and a visual response. Later, in the autokinetic room, the subject would be asked to elicit both types of responses. That is, he would be asked to "see" a letter being written, and to verbally respond with that letter.

"I'm going to insert the stress by administering a small electric shock to your wrist as you are writing the syllables. (As the writer is talking he proceeds to strap the two electrodes onto the subject's writing wrist.) First of all I will show you what the shock feels like. It is supposed to feel unpleasant, but not so unpleasant that you won't be able to stand being shocked a number of times." (The writer then adjusted the shock to a level where the subject indicated that it was definitely unpleasant, but perhaps tolerable.)

For each subject, the shock was raised to a point where the subject indicated he could not stand it, in the process of arriving at an unpleasant but tolerable level of shock.

The pilot study revealed that subjects differ considerably
in their ability to withstand an electric shock. One can not set the inductorium at a prearranged fixed level because the probability is great that there would be some subjects who could not stand it, even if it were at a fairly low level. More important, if they all could stand being shocked at a constant objective voltage, the subjective intensity would be far from constant from subject to subject. An achievement of subjective constancy, albeit crude, was deemed more important for the purposes of this study than an achievement of a possibly more refined (in an objective sense) objective constancy.

If it is granted that a crude subjective constancy between subjects is a more relevant ideal than objective constancy, there is also the problem of a subjective temporal constancy within a subject over the experimental period. A given level of shock will tend to vary in painfulness between the test period and the experiment and also during the experimental period itself for several reasons:

1. The noxious stimulus of shock tends by reflex action on the part of the subject to contract muscles and tendons. In the experimental period, however, they (muscles and tendons) are in action, continually contracting and relaxing in accordance with the subject's writing movements. The shock would tend to
disrupt a definite muscular cycle during the experimental period which probably results in a greater degree of pain. The objective evidence for this greater inferred pain might be the amount a person's arm jumps when shocked. The typical subject's arm tended to jump considerably more when shocked while writing the syllables than in the preliminary period.

2. The shock during the experimental period would probably be felt as more painful than the shock in the test period, also due to the fact that the subject in the experimental period would have a higher "drive" level. His higher "drive" level would be a result of his increased mental and physical activity that is required to complete the experimental task. Spence\textsuperscript{57} has shown that the amount of conditioning by noxious stimuli varies directly with the amount of drive. It seems also reasonable to assume that the degree of painfulness would also vary directly with the amount of drive.

3. The stress of the experiment tends to make many subjects perspire greatly. The more a subject perspires the greater will be the electrical conductance through

his wrist and consequently the more intense will be
the shock. This fact tended therefore to increase
the painfulness of the shock during the experimental
period.

4. A fourth factor might tend to decrease painfulness
during the experimental period; and that is the well­
established observation that subjects tend to adapt
to noxious stimuli by displaying a weakening of re­
flexes with repeated stimulation.

It would therefore be extremely difficult, if not
impossible, to control for all the above factors in order
to obtain a temporal "subjective constancy" of painfulness.
It was felt that the present experimental design did not
call for such a refined control because of the grossness of
the main independent variable of shock vs. non-shock.

Returning to the procedure, the subject is now instructed
as follows:

"Now, I want you to start writing the syllables.
As you write them I will shock you randomly so
that you will never know when the shock is
coming. I will remind you of any syllables
you fail to recall." (Actually the writer
administers the shock in a systematic fashion
by following a prearranged shocking schedule.
Three of the syllables were shocked twice,
and three were shocked eight times, making a
total of 30 shocks out of 90 writings. The
shock was administered usually as the subject
started to write the first letter of the syl­
lable, but occasionally it was administered
on the second letter.)
The shock was sometimes administered on the second letter of the syllable to increase the stress by increasing the unexpectedness. Observations during the pilot study revealed that it was mostly the unexpectedness of the shock rather than the shock itself that produced the high degree of stress. Subjects tried to master the stressful situation in various ways. In trying to avoid or master the pain they tended to form various hypotheses, test them for a short period, and then discard them. One hypothesis was that the shock was a "punishment" for not remembering syllables. Another was that the shock was a "punishment" for writing too slowly. Most subjects, at one time or another, thought that the shock was administered only to certain syllables. But this was usually discarded. The main point here is that the shock was very often conceived as a punishment for something they were doing incorrectly, but in all cases as something that could be mastered. It is apparently very difficult for a person to accept passively a stressful situation without various attempts at mastery. Thus in all cases the subjects made an attempt to impose some order into the situation in order either to avoid the pain or to "get set" for the pain.

After the subject had written the list fifteen times, the writer said,
'"Good!" (The writer then removed the electrodes from the subject's wrist.) "Now I would like to see how well you do with the other list of six syllables without any accompanying shock."

After the subject finished writing the syllables, the writer said,

"Well, that's the end of the experiment. Do you have any comments about the experiment?"

The subject was then reminded of his appointment at the same hour the following day, and was reassured that there wouldn't be any shock connected with the experiment the following day. After the subject left the writer rated him on his degree of disturbance while being shocked. (See appendix A for rating criteria.) The writer first identified all adjectives that seemed to be descriptive of the subject's behavior while being shocked. He then encircled either 1, 2, or 3 opposite each item. The number represented the severity of the particular behavior. (1—not severe, and 3—very severe) After all appropriate adjectives were encircled, the writer then made a judgment of the subject's general disturbance, and thus encircled either 1, 2, or 3. This was done in order to note the relationship between an individual's degree of disturbance while being shocked, and his tendency to inhibit the shocked syllables later during the autokinetic session.
Session Two

When the subject reported for the second session, he was asked to take a seat in the same position as in session one. The writer then said,

"Today I am going to study an entirely different topic, but first of all I would be interested in seeing how many of the twelve syllables you learned yesterday you can recall at this moment."

The subject proceeded to call out the syllables that he could recall. The recall period was stopped when the subject indicated that he could remember no more, or else after an interval of silence of about one minute. If the subject failed to recall all twelve syllables, he was given a list of the twelve syllables, distributed in random order (See appendix A) and asked to look at the list briefly in order to refresh his memory. The writer then said,

"Today I am studying a certain type of visual acuity in which the Air Force is interested. I will now give you a general idea of what we're going to do, and then, as we proceed I will of course get a lot more specific. First, your eyes will be tested by means of an eye chart. Next, you will be blindfolded and taken into the adjoining room. When you take your blindfold off you will see a small light. This light will be moved through space in such a way as to form words. In general your task will be to tell me which words are being written with the light."

The writer then escorted the subject from the room and determined his visual acuity with a standard eye chart situated in the hall. Next the subject put a blindfold over his
eyes, and the writer led him into the adjoining room and seated him in a chair.

The subject was blindfolded before being led into the experimental room primarily to provide him with as little physical orientation as possible in the autokinetic situation. Thus he had few clues as to the size of the room and as to the distance he was seated from the light. His main clue to both was probably obtained from the intensity of the experimenter's voice. Another reason for blind-folding the subject was to save time by giving him a chance to dark adapt while the writer was adjusting the apparatus.

The room was thus made light tight and the subject was handed a microphone. The writer then said,

"When you take your blindfold off you will soon see a small light. Now, I am going to write, not print, various words by moving the light through space in a vertical plane. I am going to try to disguise the words as much as possible in the following ways: I may write the word from left to right, as you would ordinarily see it being written, or I may write the word from right to left; I may write it vertically upward or downward; I may write it diagonally; or finally, I may write the letters in the same space on top of each other. Now, the instant that you detect a word being written, please speak that word into the microphone. You don't necessarily have to wait until the word is completed. Rather, say the word as soon as you recognize it. In general assume that you are a ground observer trying to distinguish various movements in the sky."
The rationale for the general instructions to the subject on the nature of the light movements is as follows: Preliminary studies by the writer and literature on the subject suggest that while practically all individuals experience an "autokinetic effect" (see movement by a stationary light), the extent, size, and momentary direction of movement varies from individual to individual and also within an individual from one moment to the next. The degree that a person's perceptions of the path of movement can be influenced by suggestion is very far from clear. It was therefore felt advisable to induce a response set that would conform as closely as possible to the "reality" of perceived autokinetic movements that generally occur without suggestion. Thus the subjects were instructed neither as to the size of the movements nor as to their specific direction. Preliminary studies indicated that individuals are more likely to respond with a nonsense syllable under such conditions of ambiguity.

The writer then instructed the subject to relax while the writer got set at the other side of the room. After connecting the apparatus the writer instructed the subject to remove his mask. The writer then disconnected the electric motor from the circuit and said,

"First we will test out the light. I'm going to turn on the light. As soon as you see it please say the word light into the microphone."
Now, the microphone controls the light as well as some other apparatus that I have here. So the light should turn off the instant you speak into the microphone."

After this was accomplished the writer reconnected the motor in the circuit. The electric motor, as mentioned before, was used primarily to convey to the subject an impression of an elaborate mechanical apparatus. It was disconnected during the initial testing of the light and reconnected after a response set was established in order to further contribute to the illusion that the motor was being used to power the apparatus that moved the light in space to form letters.

The writer then said,

"I'm going to turn on the light now for a certain period of time. Sometime during that period of time I'm going to write the word MAN---M-A-N. As soon as you see the word MAN being written, please say MAN into the microphone."

If the subject did not respond in 45 seconds, then the writer said, "Did you see it?" If the subject said no, then the writer said,

"This is a difficult task, and sometimes it takes a while to adjust to it. We'll try it again."

Practically every subject responded in two trials. The two or three subjects who didn't respond in two trials with the warmup word MAN were reassured that they would probably do better on the next part of the experiment; and so the
writer proceeded to the next part. To invoke an affirmation response set in the subject the writer said,

"In order to save a little time from now on I'm going to write nonsense syllables from the list of twelve nonsense syllables that you learned yesterday. As before I'm going to turn on the light for a certain period of time. Sometime during that time I am going to write one of the twelve syllables. As soon as you detect which syllable I'm writing say that particular syllable into the microphone. Please respond as fast as you possibly can. I am not going to write the syllables in any prearranged order; but I shall write some syllables more often than others. Do you have any questions?"

The rationale for the instruction, "I shall write some syllables more often than others" is as follows: The preliminary study revealed that individuals sometimes refrain from responding with a certain syllable because they had given the same response on the preceding trial. It became clear that the set that the writer was trying to induce—namely a subject's responding in every instance with the syllable that he thought he was seeing—was being contaminated by other "logical" considerations by the subject, such as his judging the probability of a syllable being repeated, and his making sure that every syllable in the list is given as a response. The above instruction was thus included in an attempt to minimize these "logical" considerations on the part of the subjects.

If a subject did not respond with a syllable in a par-
ticular trial then he was asked to take a guess with this rationale:

"Even though you might consider it a pure guess, we've found that people tend to pick up unconscious cues, and consequently your guess will probably be more accurate than you might suppose."

To induce a subject to assume a negation set the writer said,

"We've found that people in general have varying degrees of certainty as to which particular syllable is being written during a given trial, as you can probably well understand. Now, the Air Force is interested in a similar kind of uncertainty. For example if a pilot happens to spot another airplane in the sky he may be quite uncertain as to the specific identity of the plane. However, he may be more certain that the plane is not an enemy, even though he cannot identify which of the friendly planes it is. Thus, his ability to make a rapid decision that the plane is not an enemy is crucial because it may be all that he needs at a given time to save his life, or to save the life of a friendly pilot. Do you understand?"

The rationale given to the subjects for assuming a negation set proved to be quite understandable. All subjects immediately indicated that they understood what the writer was saying. It will be noted that the rationale is concerned with an imagined situation of potential danger to an individual, where the issue is one of basic security or survival. The primary motive for an individual's using the thought mechanism of defensive negation is also security, and in its broadest meaning, survival. Thus, by using this negation rationale,
the writer hoped to convey to the subject a broader connotation than merely a rationale for the specific mental operation of making a negative judgment.

"Now, we're going to study this type of uncertainty in the following way. As before I'm going to turn on the light for a certain period of time, and as before I'm going to write a nonsense syllable sometime during that period. But this time, instead of your telling me which syllable I'm writing, I want you to tell me which syllable of the list of twelve I definitely am not writing— or which syllable is least likely being written. Again, please respond as fast as you possible can. To make sure you don't forget the instructions, please precede each syllable response with the word not. So you will say, "Not so-in-so" in each case. Do you understand?"

After the subject had responded twenty times under each of the two response sets, the writer said, "You did well. Please put your mask back on."

The subject was then led out of the autokinetic room and escorted back to the first room. He was then asked if he had any comments about the experiment. By a short interview the writer tried to determine if the subject saw any connection between the two sessions, and in general if he had any degree of insight into the true purpose of the experiment.
CHAPTER V

RESULTS AND DISCUSSION

A. RESULTS OF THE EXPERIMENT

Results of the Predictions

Prediction One

Under negation instructions Group A subjects will respond with an increased number of shock-associated syllables. This general increase will be greater than any general increase or decrease of shock-associated syllables occurring with Group B subjects.

Out of a total of forty eight subjects, twenty one fitted the Group A criterion. The mean increase in shock-associated syllables for Group A was 4.43. The mean decrease (as it turned out) in shock-associated syllables for Group B was 1.43. (See figure 1) Student's t statistical test was used to determine whether the difference between the above means is significant. (See table 1) Table 1 reveals that the null hypothesis can be rejected and prediction one accepted. (p<.005)

Prediction Two

a. Group A subjects will show in general longer reaction times in connection with shock-associated syllables as compared with non-shock-associated syllables.

b. Group A subjects will show in general a differential decrease in reaction time with shock-associated syllables as compared with non-shock-
MEAN SHOCK-ASSOCIATED SYLLABLES ELICITED IN RESPONSE TO AFFIRMATION AND NEGATION INSTRUCTIONS FOR GROUP A AND GROUP B

FIGURE 1
TABLE 1

STUDENT t TEST* OF THE DIFFERENCE BETWEEN THE MEAN INCREASE (AFFIRMATION TO NEGATION) IN SHOCK-ASSOCIATED SYLLABLES FOR GROUP A AND THE MEAN DECREASE IN SHOCK-ASSOCIATED SYLLABLES FOR GROUP B

<table>
<thead>
<tr>
<th>Autokinetic Response Group</th>
<th>N</th>
<th>Mean Change</th>
<th>S.D.</th>
<th>S.E.</th>
<th>t</th>
<th>t Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>21</td>
<td>+4.43</td>
<td>3.48</td>
<td></td>
<td>1.04</td>
<td>2.28 1.68 Reject</td>
</tr>
<tr>
<td>Group B</td>
<td>21</td>
<td>-1.43</td>
<td>3.28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The F ratio for the two samples is 1.12, which is well under the critical value of 2.12 for 20 and 20 degrees of freedom. Thus the variances can be considered as homogeneous.
associated syllables from affirmation instructions to negation instructions.

The mean reaction time (affirmation instructions) for the shock-associated syllables was 29.2 seconds; whereas the mean reaction time for non-shock-associated syllables was 27.2 seconds. Thus the mean difference was 2.0 seconds. (See figure 2) Student's t statistical test for paired replicates was used to determine whether the above difference was significantly larger than zero. (See table 2) Table 2 reveals that the null hypothesis is accepted and thus prediction 2a is rejected.

The mean shocked-minus-neutral reaction time under affirmation instructions is 2.0 seconds. The mean shocked-minus-neutral reaction time under negation instructions is -0.425 seconds. (See figure 2) The F ratio for the two samples is 1.79, which is below the critical value of 2.16 for 18 and 19 degrees of freedom. Therefore the two variances can be considered homogeneous, and Student's t statistical test can be employed to determine whether the two above mean differences are significantly different. (See table 3) Table 3 reveals that the null hypothesis is accepted and thus prediction 2b is rejected.

Though we cannot technically accept prediction 2b, there are other indications which suggest that the differential decrease of 2.425 seconds from affirmation to negation

58Only subjects who responded with a syllable in 45 seconds or less were included in the analysis. The N for the affirmation set was 19—for the negation set, 20.
Group A (minority of shock-associated syllables under affirmation)

Group B (majority of shock-associated syllables under affirmation)

Mean Differential Reaction Time
In response to Affirmation and Negation
Instructions for Group A and Group B

Figure 2
### TABLE 2

**STUDENT t TEST OF THE DIFFERENCE BETWEEN THE MEAN REACTION TIME OF SHOCK-ASSOCIATED SYLLABLES AND NONSHOCK-ASSOCIATED SYLLABLES FOR GROUP A IN RESPONSE TO AFFIRMATION INSTRUCTIONS**

<table>
<thead>
<tr>
<th>Syllable Group</th>
<th>N</th>
<th>Mean Reaction Time</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock-associated</td>
<td>19</td>
<td>29.2 sec. 7.29</td>
<td>1.17</td>
<td>1.71</td>
<td>1.73</td>
<td>Accept</td>
<td></td>
</tr>
<tr>
<td>Nonshock-associated</td>
<td>19</td>
<td>27.2 sec. 7.45</td>
<td>1.17</td>
<td>1.71</td>
<td>1.73</td>
<td>Accept</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 3

STUDENT t TEST OF THE DIFFERENCE BETWEEN THE MEAN DIFFERENTIAL (SHOCKED-MINUS-NEUTRAL) REACTION TIME IN RESPONSE TO AFFIRMATION INSTRUCTIONS AND NEGATION INSTRUCTIONS FOR GROUP A

<table>
<thead>
<tr>
<th>Response Set</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95 Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affirmation</td>
<td>19</td>
<td>+ 2.0 sec.</td>
<td>5.11</td>
<td></td>
<td>1.44</td>
<td>1.684 1.686</td>
</tr>
<tr>
<td>Negation</td>
<td>20</td>
<td>- 0.425 sec.</td>
<td>3.82</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


for **Group A** is in fact related to the variable of experimental shock. A glance at figure 2 reveals that **Group B** subjects (with whom no between-conditions prediction was made) show almost no difference in reaction time between shock-associated and non-shock-associated syllables under affirmation instructions, and the comparative reactime time of shock-associated syllables increases (rather than decreases) from affirmation to negation instructions. The two groups of individuals respond in a radically different manner, thus making the responses of **Group A**, that are in the predicted direction in both instances, appear more impressive.

**Prediction Three**

**Group A** subjects will in general respond with more syllables that were associated with two shocks as compared with syllables that were associated with eight shocks.

There were 21 subjects in **Group A**. Of these 21 subjects 13 responded with more two-shock syllables than eight-shock syllables, and 8 responded with more eight-shock than two-shock syllables. While the above result is in the predicted direction it does not approach significance. We must therefore accept the null hypothesis and reject prediction three.

**Prediction Four**

a. **Group A** subjects will tend to obtain higher MMPI **K** scores than those obtained by **Group B** subjects.
b. There will be a negative correlation between the MMPI $K$ score and the number of shock-associated syllables elicited in reaction to affirmation instructions.

c. There will be a positive correlation between the MMPI $K$ score and the differential number of shock-associated syllables elicited from affirmation instructions to negation instructions. (The amount of increase of shock-associated syllables from affirmation to negation is a measure of the extent an individual is utilizing the low level thought mechanism of negation.)

a. Subjects in **Group A** obtain a mean $K$ score of 18.48, while subjects in **Group B** obtained a mean $K$ score of 15.00. (See Figure 3) Student's $t$ test is here applied to determine if the difference between the two means is significant. null (See Table 4) Table 4 reveals that the hypothesis can be rejected and the alternative prediction, $4a$, can be accepted, ($p<.0025$).

b. The Pearson product-moment correlation between the $K$ score and number of shock-associated syllables elicited under affirmation instructions is $-0.40 \pm 0.12$. The critical correlation value for 46 degrees of freedom at the .01 level of significance is .37. Thus the obtained correlation is highly significant ($p<.01$) and prediction $4b$ can be accepted.

c. The Pearson product-moment correlation between the $K$ score and the differential number of shock-associated syllables elicited from affirmation to negation instructions is $+0.29 \pm 0.13$. The critical value for 46 degrees of freedom at
FIGURE 3

MEAN K SCORE FOR GROUP A AND GROUP B

MEAN K SCORE

GROUP A

GROUP B
### TABLE 4

**Student t Test** of the Difference Between the Mean K Scores Obtained by Group A Subjects and Group B Subjects

<table>
<thead>
<tr>
<th>Autokinetic Response Group</th>
<th>N</th>
<th>Mean K Score</th>
<th>S.D.</th>
<th>S.E.</th>
<th>t</th>
<th>t.95</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>21</td>
<td>18.48</td>
<td>3.15</td>
<td></td>
<td></td>
<td>1.10</td>
<td>3.16 1.68</td>
</tr>
<tr>
<td>Group B</td>
<td>21</td>
<td>15.00</td>
<td>4.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The F ratio for these two samples is 1.81, which is below the critical value of 2.12 for 20 and 20 degrees of freedom. Thus the variances can be considered as homogeneous.*
the .05 level of significance is .285. Thus the obtained correlation is significant (p < .05) and prediction 4c can be accepted.

Another relationship suggested by the data lends additional support to the hypothesis on which prediction 4c is based, namely, that persons using a high level form of negation also tend to use a low level form of negation. Under negation instructions the mean differential reaction time (shocked syllables minus non-shocked syllables) was significantly smaller for persons scoring above median K as compared with persons scoring below median K. (See figure 4 and table 5)

**Examination of the Experimental Controls**

The experimental controls, discussed in Chapter IV, will now be examined in order to determine if these possibly contaminating variables did in fact emerge as variables in the experiment. The results relevant to the controls are presented in appendix B. The inference from the results is that in the present experimental design the factors that were controlled—namely the unique characteristics of the lists, the order of learning, the order of shock, syllable position, and order of set—do not influence the responses in the autokinetic situation.
FIGURE 4

MEAN DIFFERENTIAL REACTION TIME IN RESPONSE TO NEGATION INSTRUCTIONS FOR GROUPS ABOVE MEDIAN K AND BELOW MEDIAN K

MEAN DIFFERENTIAL REACTION TIME IN SECONDS (SHOCKED MINUS NON-SHOCKED)
### TABLE 5

**STUDENT t TEST*** of the difference between the mean differential (shocked-minus-neutral) reaction time for subjects above median $K$ and below median $K$ in response to negation instructions.

<table>
<thead>
<tr>
<th>K Score Category</th>
<th>N</th>
<th>Mean Differential Reaction Time</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>$t_{.95}$ Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Median K</td>
<td>23</td>
<td>-1.51</td>
<td>4.32</td>
<td></td>
<td>1.19</td>
<td>1.79 1.68 Reject</td>
</tr>
<tr>
<td>Below Median K</td>
<td>22</td>
<td>.618</td>
<td>3.66</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The $F$ ratio for the two groups is 1.40, which is well below the critical value of 2.08 for 21 and 22 degrees of freedom.*
Examination of Alternative Explanations

One might speculate, after considering the confirming results of Predictions One and Four, that the results might be a consequence of one or more of the following variables in addition to or rather than the experimental variables of shock and set.

a. Differential Learning

The list that was learned in fewer trials in each case would probably undergo a greater degree of overlearning during the writing period (Part II), for both lists were written 15 times. If it can be shown that the subjects, for example, who learned List J in fewer trials tended to respond with a greater number of syllables from List J in the autokinetic situation, then differential learning would be the more parsimonious explanation for differential responding. In addition, if Group A subjects tend to be composed of those subjects who had been shocked on the list that had the lesser degree of overlearning, then the Group A category, explained in terms of the defensive mechanism of simple inhibition, might be more parsimoniously explained in terms of differential learning.
Analysis shows that of the 35 subjects who learned List J in fewer trials, 16 responded with a majority of syllables from List J, 17 responded with a majority of syllables from List S, and two responded equally from both lists. Of the 19 subjects who learned List S in fewer trials, 5 responded with a majority of syllables from List J, 2 responded with a majority from List S, and 3 responded equally from both lists. The above results clearly indicate that there was little or no relationship between the differential number of trials to learn a particular list and the syllables that were elicited in the autokinetic situation.

The possibility remains that the shock generally did not occur on the list that underwent the greater degree of overlearning (i.e. learned in fewer trials in Part I). An analysis reveals that of the 35 subjects who learned List J in fewer trials, 16 were shocked on List S and 19 were shocked on List J. Of the former 16 subjects, 6 elicited a majority of non-shock-associated (List J) syllables, and 10 elicited a majority of shock-associated syllables (List S). Of the latter 19 subjects, 7 elicited a majority of non-shock-associated syllables (List S), 10 elicited a majority of shock-associated syllables (List J), and two elicited an equal number from both lists. Thus the general conclusion is that the differential speed of learning can not be invoked as an explanation for differential responding in the auto-
kinetic situation in the present experiment.

As implied in the above analysis, however, List J was generally learned in fewer trials than List S. (See Table 6) Table 6 reveals that the two means were significantly different. \((p<.0025)\) The fact that List J was generally learned in fewer trials, however, apparently had little effect on the differential total number of autokinetic responses elicited from each list, as is shown by Part B in Table 12, in appendix B.

b. **Differential Level of Shock**

Can the fact that 21 subjects fell into the Group A category be more parsimoniously explained by the possibility that they had been exposed to a generally higher objective level or intensity of shock, rather than the fact that these subjects tend to be generally more defensive (i.e. obtain generally higher \(K\) scores) and therefore have a greater tendency to utilize the defense mechanism of simple inhibition?

The mean number of Inductorium units of shock (the higher the number, the lower the shock) for the 21 subjects in Group A was 5.02, whereas the mean number of units for the 21 subjects in Group B was 4.98. The Student \(t\) test was used to determine whether the difference between the means is significant. (See Table 7) Table 7 reveals that the null hypothesis is accepted and the inference is that
### Table 6

**Student t Test of the Difference Between the Mean Number of Trials to Learn List J and List S (Nonsense Syllables) To Criterion**

<table>
<thead>
<tr>
<th>Syllable Group</th>
<th>N</th>
<th>Mean Trials to Criterion</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95 Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>List J</td>
<td>48</td>
<td>9.92</td>
<td>7.03</td>
<td></td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>List S</td>
<td>48</td>
<td>15.63</td>
<td>11.70</td>
<td></td>
<td>1.38</td>
<td>4.14 1.68 Reject</td>
</tr>
</tbody>
</table>


TABLE 7

STUDENT t TEST* OF THE DIFFERENCE BETWEEN THE MEAN NUMBER OF INDUCTORIUM (SHOCK APPARATUS) UNITS FOR GROUP A AND FOR GROUP B

<table>
<thead>
<tr>
<th>Autokinetic Response Group</th>
<th>N</th>
<th>Mean Inductorium Units</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>21</td>
<td>5.02</td>
<td>.48</td>
<td>.16</td>
<td>1.68</td>
<td>Accept</td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>21</td>
<td>4.98</td>
<td>.57</td>
<td>.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The F ratio for the above samples is 1.39, which is below the critical value of 2.12 for 20 and 20 degrees of freedom. Thus, the variances can be considered as homogeneous.
both groups had about equal objective intensities of shock. Thus the differential responding of the groups cannot be accounted for by differential objective intensities of shock.

c. Degree of Pain Inflicted by Shock

If the shock was not generally painful then the hypotheses can not be tested. What indications are there that the shock was actually painful to the subjects?

There were two types of indications that the shock was usually quite painful and disturbing to a subject. The first type was the subject's behavior, observed by the experimenter, during the period of shock. Practically all subjects showed one or more of the following types of behavioral disturbance: blocking during the writing period, profuse sweating, sighing, squirming in the seat, severe jerking of the hand, crying, verbal expressions of fear, complaints about the shock, and expressions of hostility to the experimenter.

The second type of indication was the subject's spontaneous comments about the shock when the experimenter asked for comments at the end of the experiment. The comments indicated that the subjects generally thought the shock was quite painful. (See appendix B for some samples of the comments.)
d. Degree of Insight into the Experiment

Could not differential responding in the autokinetic situation be explained by the possibility that the subjects in general were aware of the real purpose of the experiment and thus tended to respond in such a way as to please the experimenter, rather than responding with syllables that they "saw" or did not "see" being written with the autokinetic light?

A brief interview with each subject at the end of the experiment revealed that every subject accepted and believed the stated rationale for performing the experiment. No subject saw any important connection between the first and second experimental sessions. As planned, they viewed each session as separate complete entities. In addition, all subjects believed that the experimenter was moving the light through space. Most felt that the task was very difficult and frustrating, but seldom did the idea enter their heads that the light was actually stationary. When a subject did entertain such a hypothesis he soon discarded it. The experimenter told about 12 subjects during the interview that the light in fact always remained stationary. The invariable reaction was genuine disbelief and/or amazement, followed by a feeling of ridiculousness for having seen movements that weren't there. Indeed, because of the subjects' feeling
of ridiculousness, the writer ceased telling them the real purpose behind the experiment. (See appendix B for some samples of the subjects' comments concerning the auto-kinetic task.)

B. DISCUSSION OF RESULTS

Hypothesis One

The response probability of painful verbal material that is associated with the defense mechanism of simple inhibition will increase when an invoked affirmation set is altered to that of an invoked negation set.

The results of prediction one in the present experiment lends support to the above hypothesis. The inference is that an invoked negation set does in fact tend to provide an avenue for ego dystonic verbal material to enter consciousness in order to serve consciously acceptable aims.

Hypothesis Two

a. Under an invoked affirmation set, individuals who respond with less painful verbal material than neutral verbal material will also show in general longer reaction times in connection with the painful verbal material as compared with neutral verbal material.

b. These same individuals will show in general a differential decrease in reaction time with painful verbal material as compared with neutral verbal material from the affirmation set to the negation set.

The results of predictions 2a and 2b, that were formulated to test the above hypotheses, barely missed a con-
ventional level of confidence. However, an examination of another type of data tended to provide additional support for Hypothesis 2b. Although no between-conditions prediction was formulated for Group B, the data obtained from this group, when compared with Group A, makes the between-conditions data for Group A appear more impressive. That is, the between-conditions data for the two groups were in opposite directions. In addition, whereas the data for Group A was in a direction consistent with the theory under each condition, the data for Group B was in the opposite direction for the negation condition.

The writer feels that enough additional evidence is provided in the above to make the tentative assertion that Hypothesis 2b is supported by the data. The inference of Hypothesis 2b is that an invoked negation set tends to diminish forces of inhibition so that the expression of painful material is facilitated.

Hypothesis Three

Under an invoked affirmation set individuals who respond with less painful than neutral verbal material will in general respond with painful material with a low degree of painfulness.

The results of Prediction Three do not lend support to the above hypothesis. However, in the writer's opinion, comparatively little weight should be given to this result in so far as inferring that Hypothesis Three is generally
incorrect. As previously stated, there is considerable doubt that the number of associated shocks is an adequate operational definition for degree of painfulness.

In the first place, it could well be that the syllables associated with two shocks were the most painful. The syllables associated with eight shocks might be less painful because a subject might tend to adjust to these syllables being shocked, considering the fact that they were shocked over half of the time. Too little is known about aperiodic negative reinforcement at the present time to make any definite statements here. In the second place, there was probably a certain "spread of effect" with the shocked syllables. Since the high frequency and low frequency shocked syllables were in alternate positions in the list, it would seem reasonable that some of the effects of shock on a particular syllable spread to the adjoining syllables which were always shocked with the other frequency. In addition, the high anxiety associated with writing the list of six syllables while being shocked probably led to the entire list being associated with the pain. In fact it was due to the above considerations that the two lists were presented separately for learning and presented separately for writing. This was done to minimize association between the lists while learning, and minimize generalization of pain from the
shocked list to the non-shocked list. As mentioned earlier, the high and low frequency shocks were included in the present design in an attempt to replicate Harwood's results (p. 41) by using an analogous procedure.

**Hypothesis Four**

Individuals will show consistency in the extent that they utilize the following three ascending levels of defensive verbal behavior: (1) Defense mechanisms of simple inhibition in conjunction with painful verbal material. (2) A low level thought mechanism of negation in connection with the same painful verbal material, and (3) A high level thought mechanism of negation in the form of general defensive thinking.

The results of Prediction One indicated that levels (1) and (2) in the above hypothesis are related. The results of Predictions 4a and 4b indicate that levels (1) and (3) in the above hypothesis are related. The results of Prediction 4c indicate that levels (2) and (3) in the above hypothesis are related. Thus the results of Predictions One, 4a, 4b and 4c all lend support to Hypothesis Four. The general inference is that individuals tend to show consistency in the extent that they utilize the three levels of defensive verbal behavior. This result in turn lends support to the more general hypothesis that there is a consistency in the format of ego functioning on various levels of mental organization.
CHAPTER VI

THE RELATIONSHIP BETWEEN THE OPERATIONAL DEFINITIONS
OF REPRESSION AND SIMPLE INHIBITION, OTHER
ADDITIONAL RELATIONSHIPS, AND AN
INTERPRETATION OF THE K SCALE

Relation of Differential Memory to Differential Autokinetic Responding

It will be recalled that each subject was asked to remember as many of the syllables as he could 24 hours after he had learned the syllables. As stated in Chapter IV, the defense mechanism of secondary repression is often studied in the laboratory by an analogous recall procedure. Theoretically, one would expect that those subjects tending to resort to the defense mechanism of repression would also tend to resort to the defense mechanism of simple inhibition when the formerly repressed painful material is above the recall threshold. If such a relationship between repression and inhibition can indeed be shown to exist within the present experiment, then the operational definition of simple inhibition would take on further relevance. It should now be interesting to compare the differential recall of shock-associated and non-shock associated syllables with the tendency to respond with a minority (Group A) and a majority (Group B) of shock-associated syllables in reaction to affir-
mation instructions in the autokinetic situation.

If the defense mechanism of repression is here defined as the recollection of more non-shock-associated than shock-associated syllables, then the following prediction would follow:

**Predicted Relationship Between Operational Definition of Repression and Simple Inhibition**

Group A subjects will have recalled non-shock-associated syllables to a greater relative degree than Group B subjects.

The mean differential recall score (shock minus non-shock) for Group A subjects is -.57, whereas the mean differential recall score for Group B subjects is +.24. The F ratio for the two groups is 1.35, which is below the critical value of 2.12 for 20 and 20 degrees of freedom. Thus the variances can be considered as homogeneous and the Student t test employed to determine if the difference between the means is significant. (See Table 8) Table 8 reveals that the null hypothesis is accepted and the above prediction is rejected.

Although falling short of an acceptable level of confidence, the results were in the predicted direction, a fact which certainly should not be ignored. It must be concluded however that the defense mechanism of repression, as operationally here defined, is not significantly related to the defense mechanism of simple inhibition, as operationally here defined. Possible explanations for this result are of two
STUDENT $t$ TEST OF THE DIFFERENCE BETWEEN THE MEAN DIFFERENTIAL (SHOCKED MINUS NONSHOCKED) RECALL OF SYLLABLES AFTER 24 HOURS FOR GROUP A AND GROUP B

<table>
<thead>
<tr>
<th>Autokinetic Response Group</th>
<th>N</th>
<th>Mean Differential Recall</th>
<th>S. D.</th>
<th>S. E.</th>
<th>$t$</th>
<th>$t$.95</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>21</td>
<td>-.57</td>
<td>1.83</td>
<td>.526</td>
<td>1.54</td>
<td>1.68</td>
<td>Accept</td>
</tr>
<tr>
<td>Group B</td>
<td>21</td>
<td>+.24</td>
<td>1.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Perhaps the most likely explanation is that the operational definitions of both concepts fall short of an ideal degree representation. The likelihood is high that both operational definitions contain "false negatives" and "false positives" due to the factor of chance. This explanation seems most likely because there is a significant relation between the tendency to favor non-shock-associated syllables in recall by a differential of two or more and the tendency to elicit a majority of non-shock-associated syllables in the autokinetic situation (Group A). There is, in addition, no way of knowing what kinds of differential learning occurred when the subjects, after the recall period, refreshed their memories with the random list of syllables. If they concentrated mainly on the syllables that they couldn't recall, as seems likely, then the resulting increased familiarity might tend to counteract forces of inhibition, thus making it less likely that a subject would inhibit the same syllables that he had formerly repressed.

The second type of explanation is on the theoretical level. Perhaps the person who tends to forget painful material does not necessarily tend to inhibit the material when it becomes consciously available to him. Other psychological processes such as "working through" painful material might tend to play a role here.
Other Experimental Relationships that Tend to Support the Operational Definitions of Defensiveness

While the results of the present experiment generally support the hypotheses derived from the concept of spontaneous negation there might still remain some legitimate doubt as to whether the operational definitions of the defense mechanism of simple inhibition (Group A) and defensive thinking (K score) are in fact representative of intra-psychic defensiveness in the psychoanalytic sense.

If the two operational definitions of defensiveness tend to be representative of the psychoanalytic concepts, then one should be able to show that these operations are related to other operations referring to other related concepts. In accordance with this, the related concepts of conscious anxiety, learning efficiency, stress-tolerance, and suggestibility were operationally defined in terms of the present experiment. These operational definitions were then related to the two operational definitions of defensiveness.

The degree of conscious anxiety was defined in terms of an individual's score on the shortened form of the Taylor Manifest Anxiety Scale. Learning efficiency was defined in terms of the number of trials needed to learn the two lists of nonsense syllables. Stress-tolerance was defined in terms of the experimenter's estimate of the degree of dis-
turbance that a subject manifested during the time when he was being shocked. It was reasoned that severe outward signs of disturbance indicated a low tolerance for stress. Degree of suggestability was defined in terms of the number of nonsense syllables that an individual spontaneously elicited under affirmation instructions during the autokinetic task.

Seven relationships were examined. These relationships are presented and discussed in appendix B. The results were all consistent with psychoanalytic theory. The results were as follows:

1. The degree of conscious anxiety varied inversely with the degree of defensive thinking. Operationally, the Taylor scale and the K scale correlated by $-.53 \pm .10$.

2. The degree of conscious anxiety varied inversely with the tendency to use the defense mechanism of simple inhibition. Operationally, the Taylor scale and the number of shock-associated syllables elicited under affirmation instructions, correlated by $+.34 \pm .12$.

3. The degree of defensive thinking varied inversely with learning efficiency. Operationally, the K score and the number of trials to learn both lists of syllables to criterion correlated by $+.29 \pm .13$.

4. Persons who had a high degree of conscious anxiety were less efficient "learners" than persons who had a low degree of conscious anxiety. Operationally, the eleven
persons obtaining the highest Taylor scores learned
the nonsense syllables significantly slower than the
eleven persons obtaining the lowest Taylor scores.

5. The degree of defensive thinking and the degree of
conscious anxiety, considered together, were the best
predictors of learning efficiency. Operationally, the
Taylor score and the $K$ score were multiply correlated
with the number of trials to learn both lists to cri-
teron, by $+.42 \pm .12$.

6. Subjects showing the lowest stress-tolerance while being
shocked tended to use the defense mechanism of simple
inhibition to a greater degree than other subjects showing
greater stress-tolerance. Operationally, of the 10 per-
sons who were rated by the experimenter as showing severe
behavioral disturbance while being shocked, 9 were Group
A responders to the autokinetic light.

7. High-defensive subjects were more suggestible than low-
defensive subjects. Operationally, subjects scoring
above median $K$ elicited more syllable responses in 45
seconds or less than subjects scoring below median $K$.

A Suggested Interpretation of the $K$ Scale

The concept of defensive thinking was operationally
defined in terms of an individual's raw score on the $K$ scale
of the MMPI. It will be recalled that in accordance with the
Hypothesis Four, the $K$ scale score varied directly with the
tendency of an individual to use the defense mechanism of simple inhibition. (Operationally, $K$ correlated $-0.40$ with the number of shock-associated syllables elicited in response to affirmation instructions.) The $K$ score also varied directly with the tendency of an individual to use a low level thought mechanism of defensive negation. (Operationally, $K$ correlated $+0.29$ with the differential increase of shock-associated syllables elicited from affirmation instructions to negation instructions.)

$K$ was also found to be significantly related to the following other variables in the present experiment:

a. Inversely related to the degree of conscious anxiety; ($K$ scale negatively correlated with the Taylor scale by $-0.53$).

b. Inversely related to learning efficiency; ($K$ score positively correlated with number of trials-to-criterion by $+0.29$).

c. Directly related to suggestibility; (Persons scoring above median $K$ elicited a mean of 14.2 syllables spontaneously in response to the autokinetic light; persons scoring below median $K$ elicited a mean of 11.1 syllables spontaneously.)

The reader will recall the presentation of various other known characteristics of the $K$ scale. (See page 39. A detailed discussion of the $K$ scale will be found in appendix C.) The writer will now offer a tentative interpretation
of the $K$ scale with the aim of further extending or limiting the meaning of the present experimental results. It is hoped that the following interpretation will stimulate further study of the $K$ scale.

Can the apparent disagreement over whether $K$ is an indication of defensiveness or good adjustment be reconciled from present knowledge? It seems to the writer that disagreement over this point has come about through a lack of conceptual clarity in making (or a failure to make) two types of distinctions.

In the first place some writers seem to have a limited concept of defense in that they tend to equate defense and pathology, and thus fail to take into account that defensive operations on various organizational levels have varying degrees of adaptability. Thus they fail to differentiate between maladaptive, pathological defensiveness that tends to be rigid and unconscious, and more adaptive, non-pathological defensiveness that tends to be controllable and, in a certain sense, conscious. An example of the former is, of course, the defense mechanism. An example of the latter is the defensive thought mechanism. Secondly, there is an implicit tendency to equate good personal adjustment, or one's ability to use or actualize his powers in an integrated fashion, with the tendency towards cultural conformity--as might
partly be reflected in general defensive thinking.

It is clear from the literature that the $K$ scale is measuring something opposite to what is measured by $Pt$ and $Sc$ on the MMPI. The writer would interpret this as evidence than an elevated $K$ score is indicative of an adapting relatively-organized ego; but whether the adaptation is a comparatively rigid or flexible one is the important issue. There is experimental evidence which suggests that an elevated $K$ tends to be indicative of a more or less rigid cultural conformity with a consequent sacrifice of personal potential. Stated in another way—though general defensive thinking (high $K$) has a certain degree of inherent cultural adaptive utility, it should not be confused with an optimum level of personal adjustment.

It might be well at this point to further clarify what is meant by cultural conformity. First it is necessary to define anxiety. May\(^{59}\) has, interestingly enough, defined anxiety in terms of negation.

"Anxiety is the experience of the threat of imminent non-being." and, "Anxiety is the subjective state of the individual's becoming aware that his existence can become destroyed, that he can lose himself and his world, that he can become 'nothing'."

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On cultural conformity, May states, 60

"Perhaps the most ubiquitous and ever-present form of the failure to confront non-being in our day is in conformism, the tendency of the individual to let himself be absorbed in the sea of collective responses and attitudes, to become swallowed up in das Man, with the corresponding loss of his own awareness, potentialities, and whatever characterizes him as a unique and original being. The individual temporarily escapes the anxiety of non-being by this means, but at the price of forfeiting his own powers and sense of existence."

The writer proposes that K is measuring something that is very similar to what May means by "conformism". This statement is based on the following evidence: First, the study by Sweetland and Quay 61 and the present study both suggest that K is directly related to suggestibility. The former study found that K varied directly with the quantity of hypnotically-induced dream symbolization, while the present study found that K varied directly with the number of nonsense syllables that were spontaneously "seen" being written with the autokinetic light. Second, the K scale is inversely correlated with the Taylor Manifest Anxiety scale, and is directly related to dream-symbolization in the "no-feeling" category. This would seem to suggest a general diminution of affect with persons scoring high on the K

60 Ibid., p. 49.
scale. Third, K appears to vary directly with socio-economic status and also with size of home town. This is not too surprising when one considers the value orientation of the American middle class as opposed to the lower classes. The middle class value system is one of future-orientation, action-orientation, and a general striving for success which necessitates a large degree of conformity—with much less premium on expressing one's personality, having fun, being spontaneous, and thus vividly experiencing the present. The lower classes, however, tend to put primary emphasis on the present and uninhibited self expression. Fourth, and possibly most important, the present study suggests that K varies inversely with efficiency in learning nonsense syllables. Here is experimental evidence of a lessening of one's powers to which May refers as the price paid for conformity.

It is proposed that the personality pattern of the person who makes extensive use of negation on a higher level or general defensive thinking, and who in addition is amenable to an invoked negation set, tends to be as follows:

He is a fairly rigid but relatively well functioning (in some areas), symptom-free, conforming, suggestible, middle class, city-dweller, having both hysteric-like and compulsive characterological defenses. He is an individual

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62 John P. Spiegel, Lecture given at the Veterans Administration Hospital, Brockton, Mass., December 12, 1956.
who tends to use words and thoughts rather than actions as substitutes or as countering measures for what he is repressing, denying, or inhibiting. The fact that his responses on the MMPI tend to be in the opposite direction of Pt and Sc provides a clue as to the content of his repressions and thus the content of his negations. He is immediately negating the statements concerning personality weaknesses on the K scale, but on a deeper level he is possibly negating a concern with compulsive and schizoid needs, represented by Pt and Sc. He is possibly also negating impulses of aggression as is suggested by Sweetland and Quay'sfinding that K is negatively correlated with "extrapunitiveness" by -.81. This is consonant with the fact that all writers who have studied negation by clinical tests have found that an individual's responses under a negation set tend to be primarily aggressive in content.

Sperling suggests that individuals who use words or thoughts as substitutes for what is repressed or denied tend to use three secondary defense mechanisms--isolation, projection, and rationalization. There is evidence that our hypothetical individual is using isolation. This is suggested by his typically low degree of admitted anxiety and his tendency to produce dream symbolism with "no-feeling". Wheeler

\[63\text{op. cit.}\]
\[64\text{op. cit.}\]
et al. provide evidence that our individual is using projection by their finding of a high positive loading of .510 on the Pa scale for the same factor on which K had a loading of .578. McKinley et al. provide evidence which suggests that our individual is using intellectualization (a form of isolation) by his finding that the group (among his several groups) who obtained the highest mean K score were graduate electrical engineers.

The hypothetical individual tends to be a male rather than a female because the above personality pattern is more characteristic of males in our culture. Empirical evidence of this is supplied by McKinley et al. who found that the mean K scores for males was consistently higher than females in five different groups that were classified by age, education, and pathology.

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65 op. cit.
66 op. cit.
67 op. cit.
CHAPTER VII

GENERAL DISCUSSION, IMPLICATIONS FOR FURTHER STUDY, AND SUMMARY

General Discussion

The purpose of the present study was to test experimentally three hypotheses deduced from the concept of spontaneous negation.

Up to the time of the present experiment, it remained to be demonstrated that a negation set, invoked by an experimenter, does in fact accomplish a result of which the theory of spontaneous negation would be the most parsimonious explanation. Thus the central question about the concept of negation which the present experiment has attempted to answer is this: Does the negation set, that the experimenter invokes by instructions, tend to lessen ego censorship and thus provide a possible avenue for ego dystonic material (painful material ordinarily associated with a defense mechanism) to enter consciousness in order to serve ego syntonic (consciously acceptable) aims? If this statement is true then it was reasoned that the following two hypotheses should also be true and amenable to experimental demonstration:

Hypothesis One

The response probability of painful verbal material that is associated with the defense
mechanism of simple inhibition under an invoked affirmation response set will increase when the invoked affirmation set is altered to that of an invoked negation set.

Hypothesis Two

(a) Individuals demonstrating the defense mechanism of simple inhibition of painful verbal material under an invoked affirmation response set, will show a slower reaction time in connection with this painful material (as compared with nonpainful material) and will show a relative decrease in reaction time with this same painful material (as compared with nonpainful material) when the invoked affirmation set is altered to that of an invoked negation set.

The results of the present experiment tend to support Hypothesis One with little room for doubt. They also tend to support Hypothesis 2b, but with much greater room for doubt. The experimental data in general, however, offer strong support for an affirmative answer to the central negation question stated above.

A third hypothesis pertaining to defensive operations on different psychic levels of organization was generated for the purpose of further clarifying the thought mechanism of negation and thus establishing a firmer basis for the concept in general personality theory. A secondary motive for deriving a third hypothesis was to connect the experimental operations, which were of necessity on a simple level, with an operational level that was more complex and thus clinically more meaningful. The third hypothesis was deduced from the idea by Sperling68 that the ego operations

of NOT THIS BUT THIS are the basis for primitive defensive functioning and thus become the pattern for all defensive operations that are later developed by an ego. Thus the hypothesis refers to the assumption that there is a certain consistency in the format of ego functioning on different levels of psychic organization. The third hypothesis is as follows:

**Hypothesis Three**

Individuals will show consistency in the extent that they utilize the following three ascending levels of defensive verbal behavior: (1) Defense mechanism of simple inhibition in conjunction with painful verbal material (2) A low level thought mechanism of negation in connection with the same painful verbal material, and (3) A high level thought mechanism of negation in the form of general defensive thinking.

The experimental data lends support to this hypothesis. The experimental results were examined in terms of several possible alternative explanations. The examination revealed that none of these alternative explanations was adequate to explain the results. The conclusion is that the concept of negation is the best explanation for the obtained results in the present experiment.

The concept of negation on a higher level of general defensive thinking was operationally defined in terms of an elevated K score. The results of other investigations of the K scale were combined with the results of the present experiment for the purpose of providing an empirical basis
for a general interpretation of the K scale. It was suggested that an elevated K score is indicative of a more or less rigid cultural conformity. It was then hypothesized that a person with a high K score tends to have the following characteristics: He tends to be a fairly rigid but relatively well functioning (in some areas), symptom-free, conforming, suggestible, middle class, male city-dweller, having both hysteric-like and compulsive characterological defenses. He is an individual who tends to use words and thoughts rather than actions as substitutes or as countering measures for what he is repressing, denying, or inhibiting. He tends to use the secondary defense mechanisms of projection and isolation. Finally it was hypothesized that he tends to repress impulses of aggression and also certain compulsive and schizoid aspects of his personality.

Implications for Further Study

The writer proposes the following rough negation model (See Table 9) as a way of viewing basic defensive and expressive ego operations in the hope that it might be helpful as a guide for further study. The model reflects no new ideas of the writer. The writer has merely combined the ideas of Jones, Spering, and Spitz. The model is both develop-

69 "A model of transitional thought-organization", op. cit.
71 Op. cit.
### TABLE 9
NEGATION MODEL

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics Theory</th>
<th>Observable</th>
<th>Negation</th>
<th>Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>V Thought Mech.</td>
<td>Derivative of Defense Mech.</td>
<td>Flexible Controllable Cs.</td>
<td>NOT THIS BUT THIS (repressed reality testing image derivatives) creativity synthesis communication</td>
<td></td>
</tr>
<tr>
<td>Negation of painful assertion</td>
<td>General defensive thinking</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Reference to Self</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV Thought Mech.</td>
<td>Derivative of Defense Mech.</td>
<td>Flexible Controllable Cs.</td>
<td>NOT THIS BUT THIS (repressed image derivatives)</td>
<td></td>
</tr>
<tr>
<td>Negation of painful assertion</td>
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<tr>
<td>Perif. to Self</td>
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</table>

**LINE OF CONSCIOUSNESS**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Exclusion of Painful Ideas</td>
<td>Counter-cathartic activity by Organized Ego</td>
<td>Automatic</td>
<td>Ucs.</td>
</tr>
</tbody>
</table>

**ORGANIZED EGO ↔ SEMANTIC NO ↔ ANXIETY ↔ COUNTERCATHEXIS**

<table>
<thead>
<tr>
<th>II Psychotic Behavior</th>
<th>Regressive State</th>
<th>NOT THIS BUT THIS (Real object) (Image) Psychotic Denial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion of noxious reality</td>
<td>Disorganized Ego</td>
<td></td>
</tr>
</tbody>
</table>

| I Action Patterns Remove Senses from Noxious Stimulus | Ego not yet organized Ages: 0 to 18 months | NOT THIS BUT THIS (Real object) (Image) Covering eyes Not focusing optically Hiding from view Headshaking (3 months) |
mental and structural in format. It is developmental in progressing from I to III. It is structural in the sense that a "normal" individual might be operating on levels V, IV, and III at a given moment.

The basic idea behind the model is that the formula NOT THIS BUT THIS is the primary coping mechanism of the human ego, and that this formula can be observed to operate on many psychic levels of integration. The following is a brief supplementary description to Table 9:

I: On this level the coping mechanism of NOT THIS BUT THIS is accomplished by the infant via action patterns that serve to remove noxious stimuli from the sensory organs. Actually these action patterns may serve as the instigator for this basic coping mechanism. Real, noxious objects are avoided and hallucinatory images of the satisfying objects serve as substitutes for the avoided objects.

II: This is a primitive level to which an individual regresses in psychosis. On this level the ego is disorganized, with breakdown in reality testing; and painful real objects are excluded (psychotic denial), and, as on level I, hallucinatory images serve as substitutes.

III: With the advent of the semantic "no" at about 15 to 18 months of life, there concomitantly emerges a great advance in ego organization. The semantic "no" marks the
beginning of self awareness. With this new awareness the infant becomes capable of experiencing the threat of non-being or anxiety. The ego now becomes capable of using the same coping schema--NOT THIS BUT THIS--to exclude painful ideas from within rather than from without; for the function of reality testing no longer permits the exclusion of painful stimuli from the outside world. With stimuli from the external world, only the meaning of the stimuli and not the stimuli itself can now be excluded. Stimuli from within begin to be excluded via the counter cathctic operations which are now set in motion and thus the defense mechanism of secondary repression emerges. With continued painful stimulation from within the defense mechanism becomes automatic, rigid, and unconscious. In order to support the repression other defenses come into being as substitutes for the repressed internal states, following the BUT-THIS component of the formula.

IV and V: These are the levels of the thought mechanism of negation. These levels represent a high degree of psychic organization in that the operation of the thought mechanism of negation tends to be more flexible, controllable, and conscious than is the defense mechanism. By way of the thought mechanism repressed content can be brought into consciousness for purposes of better adaptation, on condition of course that the content is disbelieved. The first half of
the formula--NOT THIS--when used alone, represents an instance of the thought mechanism of negation being used for solely defensive purposes. (E.g. I am not depressed.) However, even when the purpose is solely one of defense, the second half of the formula--BUT THIS--is usually also used. (E.g. I am not depressed; I have been peeling onions.) The BUT-THIS component of the formula allows all varieties of ideas to be expressed with much greater facility when once the distasteful aspect of the ideas has been identified and negated. (E.g. I don't mean to imply that you're dishonest, but I would like a receipt.)

The basis for distinguishing between levels IV and V is the degree to which the negated material pertains to the individual himself. It is assumed, for example, that single words or statements referring to ideas peripheral to the self are not as highly organized as statements referring to ideas central to the self.

Suggestions for Further Study

There is a considerable number of questions that have crystalized from recent studies on the thought mechanism of negation. Future research should provide an answer for many of them. The present study was primarily concerned with negation as it is used by an adult psyche for purposes of defense. (The NOT-THIS portion of Table 9). Negation probably has its greatest utility as a thought mechanism, however,
in the role of facilitating self expression and interpersonal communication. Here the whole formula NOT THIS BUT THIS would be studied. In general the concept of negation offers a promising conceptual "handle" for studying highly organized, complex, subtle ego operations as they relate to or are derived from simpler and more primitive ego operations.

An immediate question of interest arising from the present study is this: How efficient is the K scale in identifying persons who use defensive thinking? Will persons with elevated K scores tend to respond to a negation set on clinical instruments such as the WAT or TAT with more ego dystonic material than those persons with lower K scores? The results of the present study suggest that such would indeed be the case. There is also a suggestion that persons scoring high on K should elicit more aggressive negated material than persons scoring low on K.

Some other more general questions that have arisen are as follows:

Once the negated material comes to consciousness does the anxiety return, thus, for example, making the material subject to the forgetting process, or does the negation set continue to serve the function of warding off anxiety?

How much anxiety do negation instructions generally obviate? Or how close to consciousness is the material that is generally elicited?
Is every primitive response given to the WAT under negation instructions ego dystonic, or is this true only with certain responses? Along the same lines, to what extent is the negation response dependent on the stimulus? Does the negation set give ego dystonic material the "go ahead" to be expressed on practically any stimulus, or does its expression tend to be limited to a stimulus representing a conflict? If the letter is true how can one differentiate between a stimulus that represents a conflict and one that does not?

Summary

Theory

Modern psychoanalytic theory has been primarily concerned with ego functions. Negation is thought to be one of the most basic ego functions—if not the most basic ego function. Freud first introduced the concept in 1915 with his paper, "The Unconscious", and then further developed it in his paper entitled "Negation" in 1925. Jones and Spitz have both made recent theoretical contributions that serve to clarify and extend the meaning of the concept. Basically, negation, as a thought mechanism, serves adaptation by allowing a repressed or inhibited idea to enter consciousness to be used for consciously acceptable purposes.

\[^{72}^{\text{Op. cit.}}\]
\[^{73}^{\text{Op. cit.}}\]
\[^{74}^{\text{A model of transitional thought-organization}, \text{ op. cit.}}\]
\[^{75}^{\text{Op. cit.}}\]
on the condition that the idea is consciously disbelieved. The mechanism of negation tends to allay the painful affect or anxiety that is connected with an unacceptable idea.

Jones, Slack, and Grieve have attempted to invoke a negation response set in an individual and broadly predict the nature of his responses to the WAT, TAT and also to interviews. Results were all consistent with the concept of spontaneous negation; but there remained the question of whether or not the concept of negation was the most parsimonious explanation. The present study was designed in such a way that negation would best explain the predicted results.

**Hypotheses**

Three hypotheses were generated from the concept of spontaneous negation.

The first hypothesis stated that the response probability of painful verbal material that is associated with the defense mechanism of simple inhibition under an invoked affirmation response set will increase when the invoked affirmation response set is altered to that of an invoked negation set.

A second hypothesis stated that the response reaction

76 "The negation TAT; a projective method for eliciting repressed thought content", op. cit.
time of inhibited painful material should decrease with the altered set.

A third hypothesis stated that there would be individual consistency in defensive operations on different levels of psychic organization. That is, individuals who tend to inhibit painful material under affirmation, will tend to negate the material under negation, and will tend to evidence general defensive thinking with an independent measure.

**Design**

Each subject was asked to complete a forty-seven item inventory that included the $K$ scale of the MMPI and the Taylor Manifest Anxiety scale. General defensive thinking was defined as an elevated score on the $K$ scale.

Each of the 48 subjects learned two lists of six nonsense syllables to an identical criterion. One list was then associated with 30 electric shocks as the subject wrote the list 15 times. The other list had no shock while being written 15 times. Painful and neutral verbal material were defined as syllables associated with shock and syllables not associated with shock.

Twenty-four hours later the subject was exposed to an autokinetic (stationary) light, and informed that the experimenter was going to move the light through space and write syllables from the list of twelve syllables that were learned the day before. The subject was asked to respond with the
syllable that was being written with the light on each of 20 trials (Affirmation response set). Each subject was then asked to respond with a syllable that definitely was not being written on each of 20 trials (negation response set).

Results

The first hypothesis was supported with little room for doubt. The second hypothesis barely missed a conventional level of confidence, but other evidence tended to provide added support for this hypothesis. The third hypothesis was also supported.

The general implication of the results is that an invoked negation set tends to allow ordinarily inhibited painful verbal material to enter consciousness. In addition there is consistency in defensive verbal behavior on different levels of mental organization.
APPENDIX A

THE INVENTORY COMPOSED OF THE MMPI K SCALE AND THE BENDIG FORM OF THE TAYLOR MANIFEST ANXIETY SCALE, SCHEDULE FOR ADMINISTERING SHOCK, BEHAVIORAL-DISTURBANCE CRITERIA, LIST OF SYLLABLES IN RANDOM ORDER, AND ELECTRICAL CIRCUIT FOR AUTOKINETIC EXPERIMENT
THE MMPI K SCALE AND THE BENDIG FORM OF THE TAYLOR MANIFEST ANXIETY SCALE

Explanation

Statements comprising the K scale are marked "K" at the left. Statements comprising the Taylor Anxiety scale are marked "A" at the left. The "K" and "A" appear under either "T" (answered true) or "F" (answered false) in order to indicate the response condition under which the statement is scored on either scale.

T F

K 1. At times I feel like swearing.
K 2. At times I feel like smashing things.
K 3. I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.
K 4. It takes a lot of argument to convince most people of the truth.
A 5. I believe I am no more nervous than most others.
A 6. I work under a great deal of tension.
K 7. I have very few quarrels with members of my family.
K 8. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.
A 9. I cannot keep my mind on one thing.
K 10. Often I can't understand why I have been so cross and nervous.
T F

K 11. At times my thoughts have raced ahead faster than I could speak them.

K 12. Criticism or scolding hurts me terribly.

A 13. I am more sensitive than most other people.


A 15. I am usually calm and not easily upset.

A K 16. I certainly feel useless at times.

K 17. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.

K 18. I have never felt better in my life than I do now.

A 19. I feel anxiety about something or someone almost all the time.

K 20. What others think of me does not bother me.

K 21. It makes me feel uncomfortable to put on a stunt at a party even when others are doing the same sort of things.

A 22. I am happy most of the time.

A 23. I have periods of such great restlessness that I cannot sit long in a chair.

A K 24. I have sometimes felt that difficulties were piling up so high that I could not overcome them.

K 25. I find it hard to make talk when I meet new people.
T F

K 26. I am against giving money to beggars.
K 27. I get mad easily and get over it soon.

A 28. I find it hard to keep my mind on a task or job.
K 29. When in a group of people I have trouble thinking of the right things to talk about.
K 30. At times I am all full of energy.
K 31. I have periods in which I feel unusually cheerful without any special reason.
A 32. I am not unusually self conscious.
K 33. I think nearly anyone would tell a lie to keep out of trouble.
A 34. I am inclined to take things hard.
A 35. Life is a strain for me much of the time.
K 36. I worry over money and business.
A 37. At times I think I am no good at all.
A 38. I am certainly lacking in self confidence.
A 39. I am a high strung person.
K 40. At periods my mind seems to work more slowly than usual.
K 41. People often disappoint me.
K 42. I often think, "I wish I were a child again."
A 43. I sometimes feel that I am about to go to pieces.
K 44. I have often met people who were supposed to be experts who were no better than I.
45. I shrink from facing a crisis or difficulty.

46. I find it hard to set aside a task that I have undertaken, even for a short time.

47. I like to let people know where I stand on things.
**Explanation**

Only one list of syllables was associated with shock for each subject. The shocked list was indicated by placing a check in the square opposite SHOCK. Each list was written 15 times in the order indicated. The cross indicates when a particular syllable was shocked. HS (High Shock) refers to the syllables that had 8 shocks. LS (Low Shock) refers to the syllables that had 2 shocks.

**Schedule I**

<table>
<thead>
<tr>
<th>SHOCK</th>
<th>HS 2,4,6</th>
<th>LS 1,3,5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   2   3   4   5   6   7   8   9   10   11   12   13   14   15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. JAT</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. ZQR</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. BEH</td>
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<td>X</td>
</tr>
<tr>
<td>4. QAM</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5. LUY</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. TIV</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Schedule II**

<table>
<thead>
<tr>
<th>SHOCK</th>
<th>HS 2,4,6</th>
<th>LS 1,3,5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   2   3   4   5   6   7   8   9   10   11   12   13   14   15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. SAJ</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. GOK</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. RER</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. KAZ</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5. HUC</td>
<td>X</td>
<td>X</td>
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<td>6. CIV</td>
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### Schedule II

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<th>LS 2,4,6</th>
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<td>HS 1,3,5</td>
<td>LS 2,4,6</td>
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<td>X</td>
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<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>QAM</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>LUJ</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.</td>
<td>TIV</td>
<td>X</td>
<td>X</td>
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<table>
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<th>LS 2,4,6</th>
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</thead>
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<td>X</td>
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<tr>
<td>2.</td>
<td>GOK</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>FEP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>KAZ</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>HUQ</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.</td>
<td>CIW</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
CRITERIA FOR ESTIMATING THE DEGREE OF
BEHAVIORAL DISTURBANCE DURING
THE PERIOD OF SHOCK

Explanation

The experimenter rated each subject on his general degree of disturbance while being shocked. The experimenter first identified all items descriptive of the subject's behavior while being shocked. He then encircled either 1, 2, or 3 opposite each item. The number represented the severity of the particular behavior. (1--not severe, 2--quite severe, and 3--very severe) After all appropriate items were encircled, the experimenter made a judgment of the subject's general disturbance, and encircled either 1, 2, or 3.

<table>
<thead>
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<th>BEHAVIOR</th>
<th>SEVERITY</th>
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<td>Sweating</td>
<td></td>
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<tr>
<td>Sighing</td>
<td></td>
</tr>
<tr>
<td>Squirming</td>
<td></td>
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<tr>
<td>Hand Jerking</td>
<td></td>
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<tr>
<td>Crying</td>
<td></td>
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<tr>
<td>Verbal-Fear</td>
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<td>Hostility to E</td>
<td></td>
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<tr>
<td>Complaints-Shock</td>
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</tr>
<tr>
<td>Complaints-Task</td>
<td></td>
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</tbody>
</table>
LIST OF THE TWELVE SYLLABLES IN RANDOM ORDER

Whenever a subject failed to recall all twelve syllables that had been learned 24 hours earlier, he was given a card on which were printed the twelve syllables in the following random order for the purpose of refreshing his memory.

ZOR
KAZ
LUY
GIW
FEP
GOK
JAT
HUQ
QAM
SAJ
TIV
BEH
AUTOKINETIC LIGHT
Schematic Diagram of Electrical Circuit

Figure 5
APPENDIX B

EXPERIMENTAL DATA, RESULTS OF THE EXPERIMENTAL CONTROLS, ADDITIONAL EXPERIMENTAL RELATIONSHIPS, AND COMMENTS FROM SUBJECTS ABOUT THE ELECTRIC SHOCK AND THE AUTOKINETIC TASK
THE EXPERIMENTAL DATA

Explanation of Tables 10 and 11

1. Subject Code: Each subject was given a code number which denotes four types of control information.
   a. The first letter refers to the name of the list which was learned first--either list S or list J.
   b. The second letter refers to the list that was shocked--either list S or list J.
   c. The first number refers to the three syllables that had 8 shocks. Number one refers to syllables in positions 1, 3, and 5. Number two refers to syllables in positions 2, 4, and 6.
   d. The second number refers to the order of the experimental condition. Number one means that the negation set was invoked first. Number two means that the negation set was invoked second.

2. All the data is ordered in terms of the subject's score on the K scale.

3. The numbers under the AFFIRMATION AND NEGATION columns refer to the number of shocked and neutral syllables elicited under each condition.

4. The TOTAL column refers to the increase or decrease in shocked syllables from affirmation to negation.

5. The SHOCKED SYLLABLES ONLY column refers to the number of shocked syllables elicited that had been previously associated with 8 shocks and 2 shocks.

6. The MEMORY column refers to the number of shocked and neutral syllables that were recalled 24 hours after learning them.

7. The TRIALS TO LEARN column refers to the number of trials needed to learn list J and list S to the criterion of three perfect consecutive repetitions.

8. The DISTURBANCE column refers to the rated degree of disturbance during the period of shock.
9. The SHOCK LEVEL column refers to the objective level of shock. (The higher the number, the lower the shock.)

10. The last column refers to the age of the subject, his college year (G means graduate student), and the subject's graduate major (Ph. - philosophy, Ed. - education, Th. - theology, Sp. - School of public relations).

11. In Table 11 "Reaction Time" refers to the mean reaction time. It is recorded to the nearest tenth of a second. The "No." refers to the number of syllables included in the computation of the mean reaction time (i.e. the number of syllables elicited in 45 seconds or less).
### Table 10

**General Experimental Data**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>K SCALE</th>
<th>L SCALE</th>
<th>S</th>
<th>LN(S)</th>
<th>TRAITS</th>
<th>TRIALS</th>
<th>LEARN</th>
<th>SYLLONLY</th>
<th>SYLSONLY</th>
<th>AGE</th>
<th>SEMESTER</th>
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<tbody>
<tr>
<td>S1 21</td>
<td>14.0</td>
<td>7.13</td>
<td>3</td>
<td>9.11</td>
<td>12.8</td>
<td>4</td>
<td>2</td>
<td>7.0</td>
<td>6.3</td>
<td>3.5</td>
<td>14.4</td>
</tr>
<tr>
<td>S1 21</td>
<td>14.0</td>
<td>7.13</td>
<td>3</td>
<td>9.11</td>
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<td>4</td>
<td>2</td>
<td>7.0</td>
<td>6.3</td>
<td>3.5</td>
<td>14.4</td>
</tr>
<tr>
<td>S1 24</td>
<td>10.0</td>
<td>7.13</td>
<td>3</td>
<td>9.11</td>
<td>12.8</td>
<td>4</td>
<td>2</td>
<td>7.0</td>
<td>6.3</td>
<td>3.5</td>
<td>14.4</td>
</tr>
<tr>
<td>S1 22</td>
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<td>7.13</td>
<td>3</td>
<td>9.11</td>
<td>12.8</td>
<td>4</td>
<td>2</td>
<td>7.0</td>
<td>6.3</td>
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<tr>
<td>S1 22</td>
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<td>7.13</td>
<td>3</td>
<td>9.11</td>
<td>12.8</td>
<td>4</td>
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<td>7.0</td>
<td>6.3</td>
<td>3.5</td>
<td>14.4</td>
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<tr>
<td>S1 22</td>
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<td>7.13</td>
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<td>4</td>
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<td>7.0</td>
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<td>S1 22</td>
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<td>7.0</td>
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**Note:** The table continues with more rows and columns, detailing various measurements and comparisons.
# REACTION TIME DATA

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<tr>
<th>SUBJECT CODE</th>
<th>R-T SCALE</th>
<th>AFFIRMATION</th>
<th>NEUTRAL</th>
<th>TOTAL</th>
<th>NEGATION</th>
<th>SHOCKED</th>
<th>NEUTRAL</th>
<th>TOTAL</th>
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<tr>
<td>SS 2.1</td>
<td>2F 0</td>
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<td>1.17</td>
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<td>1.17</td>
<td>2.0218</td>
<td>1.50</td>
<td>0.9</td>
<td>1.84</td>
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<td>1.50</td>
<td>0.9</td>
<td>1.84</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**TABLE 11**
RESULTS OF THE EXPERIMENTAL CONTROLS

Each control will be stated as a null hypothesis. The Student's t statistical test was used in each case to test whether or not the difference between the means was significant. These data are represented in Table 12.

A. The number of syllables that subject elicit from List J is not a function of the order List J was learned, under both affirmation and negation conditions.

B. The mean number of syllables that subjects elicit from List J is equal to the mean number elicited from List S, under both affirmation and negation conditions.

The mean number of syllables that subjects elicit from the list that was learned first is equal to the mean number elicited from the list that was learned second, under both affirmation and negation conditions.

C. The mean number of shock-associated syllables that subjects elicit from the list that was shocked first is equal to the mean number elicited from the list that was shocked second, under both affirmation and negation conditions.

The mean number of shock-associated syllables that subjects elicit when List S is associated with shock is equal to the mean number elicited when List J is associated with shock, under both affirmation and negation conditions.

D. The mean number of shock-associated syllables that subjects elicit from syllable positions 1, 3, and 5 will be equal to the mean number elicited from positions 2, 4, and 6, under both affirmation and negation conditions.

E. The mean number of shock-associated syllables that subjects elicit when the negation condition is first in order is equal to the mean number elicited when the negation condition is second in order, under both affirmation and negation conditions.
TABLE 12

STUDENT t TESTS FOR THE CONTROLS

<table>
<thead>
<tr>
<th>Group</th>
<th>Set</th>
<th>N</th>
<th>Mean</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t .95</th>
<th>Decision</th>
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<td>J</td>
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<td>B. List S</td>
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<td>S</td>
<td>9.96</td>
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* t test for paired replicates
<table>
<thead>
<tr>
<th>Group</th>
<th>Set</th>
<th>N</th>
<th>Mean Syllables</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95 Decision</th>
</tr>
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<tr>
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<td>3.52</td>
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<td></td>
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<td>A</td>
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<td>.92</td>
<td>.82 1.68 Accept</td>
</tr>
<tr>
<td>Shock Second</td>
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<td>10.58</td>
<td>2.69</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Shock First</td>
<td>24</td>
<td>11.21</td>
<td>3.34</td>
<td></td>
<td></td>
<td>.93</td>
<td>.45 1.68 Accept</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock Second</td>
<td>24</td>
<td>11.63</td>
<td>3.15</td>
<td></td>
<td></td>
<td>.93</td>
<td>.09 1.68 Accept</td>
</tr>
<tr>
<td>Shock &quot;S&quot;</td>
<td>24</td>
<td>10.17</td>
<td>3.10</td>
<td></td>
<td></td>
<td>.93</td>
<td>.09 1.68 Accept</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock &quot;J&quot;</td>
<td>24</td>
<td>10.25</td>
<td>3.34</td>
<td></td>
<td></td>
<td>.93</td>
<td>.09 1.68 Accept</td>
</tr>
<tr>
<td>Shock &quot;S&quot;</td>
<td>24</td>
<td>11.00</td>
<td>3.09</td>
<td></td>
<td></td>
<td>.93</td>
<td>.90 1.68 Accept</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock &quot;J&quot;</td>
<td>24</td>
<td>11.83</td>
<td>3.36</td>
<td></td>
<td></td>
<td>.93</td>
<td>.90 1.68 Accept</td>
</tr>
</tbody>
</table>

* t test for paired replicates
### TABLE 12 (Continued)

**STUDENT t TEST FOR THE CONTROLS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Set</th>
<th>N</th>
<th>Mean Shocked Syllables</th>
<th>S. D.</th>
<th>S. E.</th>
<th>t</th>
<th>t.95 Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D. Shocked Syllables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1, 3, 5</td>
<td></td>
<td>48</td>
<td>5.17</td>
<td>3.04</td>
<td></td>
<td>.63</td>
<td>.20*1.68 Accept</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shocked Syllables</td>
<td></td>
<td>48</td>
<td>5.04</td>
<td>2.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 4, 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>E. Negation</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>First</td>
<td></td>
<td>24</td>
<td>9.77</td>
<td>3.69</td>
<td></td>
<td>.92</td>
<td>.72 1.68 Accept</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negation Second</td>
<td></td>
<td>24</td>
<td>10.54</td>
<td>2.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td></td>
<td>24</td>
<td>11.29</td>
<td>3.44</td>
<td></td>
<td>.94</td>
<td>.38 1.68 Accept</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negation Second</td>
<td></td>
<td>24</td>
<td>11.65</td>
<td>3.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* t test for paired replicates
ADDITIONAL EXPERIMENTAL RELATIONSHIPS

1. According to psychoanalytic theory the concepts of conscious anxiety and defense are intimately related, such that conscious anxiety is thought to be the motive for defensive operations. That is, defenses come about in order to reduce conscious anxiety. Strictly speaking anxiety serves to signal a situation of danger. However, when the danger situation is unknown to an individual, as is the case with unconscious conflict, then the defensive operations are inserted primarily to reduce conscious anxiety rather than mastering the situation of danger.

In the present experiment the degree of conscious anxiety should vary inversely with the degree of defensive thinking. Operationally, the Taylor Anxiety score should have a negative correlation with the $K$ score.

The Pearson product-moment correlation between the Taylor scale and the $K$ scale is $-0.53 \pm 0.10$. This correlation is highly significant, being well above the $99\%$ confidence level (.369) for 46 degrees of freedom. The above prediction is thus confirmed.

2. In the present experiment the degree of conscious anxiety should vary inversely with the tendency to use the defense mechanism of simple inhibition. Operationally, the
Taylor score should be positively correlated with the number of shock-associated syllables elicited under affirmation instructions.

The Pearson product-moment correlation between the Taylor scale and the number of shock-associated syllables elicited under affirmation instructions is $+.34 \pm .12$. This correlation is significant at well above the .05 level (.285) for 46 degrees of freedom.

In addition, the multiple correlation of both the Taylor scale and the $K$ scale with the number of shock-associated syllables elicited under affirmation instructions is $+.43 \pm .13$. This correlation is significant at the .01 level (.43) for 3 variables and 45 degrees of freedom. The above prediction is thus confirmed.

3. Defensive operations require psychic energy. The quantity of psychic energy that an individual has is limited. Therefore, individuals who are highly defensive would tend to have relatively less energy left for purposes of mastering real conscious situations, than individuals who are relatively less defensive.

In the present experiment the degree of defensive thinking should vary inversely with learning efficiency. Operationally, the $K$ score should be positively correlated with the total number of trials to learn both lists of
syllables to criterion.

The Pearson product-moment correlation between the K scale and total trials to learn both lists of syllables is \( +.29 \pm .13 \). This correlation is significant at the .05 level for 46 degrees of freedom. Thus the above prediction is confirmed.

There is the possibility that the correlation of K with trials to criterion is an artifact due to the possibility that one or more of the more basic variables known to be relevant to learning efficiency also vary systematically with K. Two such relevant variables are age and intelligence. The Mann and Whitney U statistic was used to determine whether the mean age of the subjects with above median K scores was significantly different from the mean age of subjects with below median K scores. The resulting Z value of 1.15 is well below the .05 level of significance. Thus the variable of age is not significantly related to K.

Since the present experiment did not include a measure of intelligence, there is no way of determining whether or not the K score varies with intelligence in the present experiment. However, Schmidt\(^7\) has run a correlation of K with intelligence, and found for his sample of 98 “normals” the correlation was almost zero (.004).

4. Anxiety itself may also lead to disorganized functioning and consequent inefficient mastery of real situations, when the anxiety is at a high level and, for one reason or another, defensive operations are not utilized.

Anxiety, considered in the context of learning theory, is usually considered to have general "drive" properties and/or "drive stimulus" properties. The Iowa school, accenting the drive properties, looks upon anxiety as augmenting "reaction potential", which is a multiplicative function of habit strength and drive. The implication is that anxiety should increase the reaction potential and thus increase learning efficiency on very simple tasks where a minimum amount of incorrect responses are possible (e.g. eye lid conditioning). However, anxiety should serve to decrease learning efficiency on more complicated tasks where incorrect responses are very likely (e.g. lists of nonsense syllables). The present learning task of nonsense syllables would probably be considered as a complicated task, and thus anxiety should serve to decrease learning efficiency.

In the present experiment, then, the degree of conscious anxiety should vary inversely with learning efficiency. Operationally, the Taylor score should be positively correlated

---

with the total number of trials to learn both lists to criterion.

The Pearson product-moment correlation between the Taylor scale and Total Trials to Learn, is +.10 ±.14. This value falls short of the .05 level of significance. However, if the eleven persons obtaining the highest Taylor scores are compared with the eleven persons obtaining the lowest Taylor scores, in terms of total trials to learn the syllables, we find that the first group (Taylor scores ranging from zero to two) learned the two lists of syllables in 14.9 mean number of trials, while the second group (Taylor scores of nine and above) learned the two lists of syllables in 27.5 mean number of trials. The F ratio for the two samples is 4.47, which is well above the .05 critical value for 10 and 10 degrees of freedom. Thus the variances are significantly different. Since the variances cannot be considered homogeneous the error estimate for the two samples cannot be pooled. Instead, the formula \( t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S^2_1}{N_1} + \frac{S^2_2}{N_2}}} \) was used to determine whether the means are significantly different. This relationship has an approximate \( t \) distribution. (See Table 13) Table 13 reveals that the null hypothesis is rejected, and thus the prediction is accepted.

While the general correlation between all values of the two variables is not significant, the high and low scorers
TABLE 13

STUDENT $t$ TEST OF THE DIFFERENCE BETWEEN THE MEAN TRIALS TO CRITERION IN LEARNING TWO LISTS OF NONSENSE SYLLABLES FOR THE ELEVEN SUBJECTS OBTAINING THE HIGHEST TAYLOR SCORES AND THE ELEVEN SUBJECTS OBTAINING THE LOWEST TAYLOR SCORES

<table>
<thead>
<tr>
<th>Taylor Group</th>
<th>N</th>
<th>Mean Trials</th>
<th>S. D.</th>
<th>S. E.</th>
<th>$t$</th>
<th>$t_{.95}$</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest</td>
<td>11</td>
<td>27.5</td>
<td>14.1</td>
<td></td>
<td></td>
<td>4.72</td>
<td>2.67 1.81</td>
</tr>
<tr>
<td>Lowest</td>
<td>11</td>
<td>14.9</td>
<td>6.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
on the Taylor scale do learn the syllables in a slower and faster fashion respectively. The low scorers' greater efficiency is also more predictable. (I.e. the variance is smaller.)

5. The degree of defensive thinking and the degree of conscious anxiety, considered together, should be the best predictor of learning efficiency. Operationally, the Taylor score and the K score should be positively multiply correlated to a high degree with the total number of trials to learn both lists to criterion.

The multiple correlation of the Taylor score and the K score with the total number of trials to learn both lists is $+.42 \pm .12$. This value is significant ($p < .02$) for 45 degrees of freedom.

It is interesting to observe the correlation of K with total trials with the Taylor score being "partialed out" or remaining constant; and the correlation of the Taylor score with total trials with K remaining constant. Both partial correlations are significant ($p < .05$) for 45 degrees of freedom. The former correlation value (K with Trials) is $+.41 \pm .12$, and the latter correlation value (Taylor score with Trials) is $+.32 \pm .13$. Thus, while both scales are significant predictors of learning efficiency, the K scale is the better predictor in the present experiment. This result
is extremely interesting, when one considers the fact that the Taylor scale and the \( K \) scale are negatively correlated \((-0.53)\). Should further research substantiate the inverse relationship of \( K \) to learning efficiency, then this would have far-reaching implications for present learning theories, particularly that of the Iowa school.

6. Subjects, in the present experiment, showing a low stress-tolerance during the stressful task should tend to be those who later utilize the defense mechanism of simple inhibition with the material associated with the task. Operationally, subjects who score highest on the experimenter's estimate-of-behavioral-disturbance scale will tend to be those subjects eliciting a minority of shock-associated syllables under affirmation instructions (Group A).

Considering only the 42 subjects in Group A and Group B, one finds that there were 10 subjects who were rated on the third level of disturbance (most disturbed), 19 subjects who were rated on the second level of disturbance, and 13 subjects who were rated on the first level of disturbance (least disturbed). Nine out of ten subjects rated on the third level were Group A subjects, six out of nineteen subjects rated on the second level were Group A subjects, and six out of thirteen subjects rated on the first level were Group A subjects. The Chi-square test applied to these data results
in a value of 9.06 for 2 degrees of freedom. This value is significant. (p<.025) Thus, the rated degree of disturbance is related to the number of shock-associated syllables elicited in the autokinetic situation in a manner that is consistent with the theory.

7. Individuals who are highly defensive, as stated above, would tend to have less energy available for efficient mastery of a realistic task. In addition, these individuals would tend to be less able to tolerate the anxiety arising from their inability to solve a difficult task. The present autokinetic task is an example of a task without a solution in reality, for no syllables are ever written with the light. It would thus seem reasonable that the more generally defensive an individual is, the less likely he would be able to admit to himself or to the experimenter that he could not generally see the syllables being written, and thus, the more likely he would respond with a syllable before the light is automatically turned out after 45 seconds.

Operationally, subjects scoring above median $K$ should elicit more responses in 45 seconds or less than subjects scoring below median $K$.

The mean number of responses occurring in 45 seconds or less for the 24 subjects above median $K$ is 14.2, while the mean number of responses for the 24 subjects below median
K is 11.1. The F ratio for the two samples is 3.35, which is well above the .05 critical value (2.02) for 23 and 23 degrees of freedom. Thus the variances are significantly different—the variance for the subjects above median K being smaller. Since the variances are not homogeneous, the formula \( t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}} \) was used to determine whether the above means were also significantly different. (See Table 14) Table 14 reveals that the null hypothesis is rejected, and thus the prediction is accepted. Thus, subjects with high K scores generally elicited more responses and were more consistent in doing so than subjects with low K scores. The general implication of this result is that the more defensive a subject is, the more predictable and the more conforming will be his behavior in performing on an ambiguous task. This idea is again consistent with the general theory.
TABLE 14

STUDENT t TEST OF THE DIFFERENCE BETWEEN THE MEAN NUMBER OF AUTOKINETIC RESPONSES IN 45 SECONDS OR LESS FOR THE GROUP SCORING ABOVE MEDIAN K AND THE GROUP SCORING BELOW MEDIAN K

<table>
<thead>
<tr>
<th>K Score Category</th>
<th>N</th>
<th>Mean Autokinetic Responses (45 seconds or less)</th>
<th>S.D.</th>
<th>S.E.</th>
<th>t</th>
<th>t.95</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Median K</td>
<td>24</td>
<td>14.2</td>
<td>3.88</td>
<td></td>
<td>1.62</td>
<td>1.91</td>
<td>1.71</td>
</tr>
<tr>
<td>Below Median K</td>
<td>24</td>
<td>11.1</td>
<td>7.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COMMENTS FROM SUBJECTS ABOUT THE AUTOKINETIC TASK

The following comments about the autokinetic task are typical of the comments received from all of the subjects.

"I kept in mind 3 or 4 letters--then I could shoot for any of the others that didn't contain it. The ones that were written one letter over the other are easier to read--over to the right, not too bad--over to the left were toughest."

"Towards the end I was guessing on a lot of them. After a while your eyes start tiring. At first it was easy."

"The second part was easier (Negation)--could make out readily a straight line from a curved line."

"It was very difficult to spot the direction--almost impossible to pick out letters. On the second part (Negation) if it were apparently straight up and down, it couldn't be a curved letter. It's much easier to pick out that which isn't rather than that which is."

"In the first part (Negation) it seemed to me it was easier to be wrong than to be right--if I recognized one letter in the syllable I tried to respond with a syllable that had as much of an opposite sound and shape as I could. In the second part one obviously had to feel that he recognizes a vowel and one of the consonants any one of the syllables--QAM in succession was very easy, the wavy motion of the M--the A and the M I felt confident. The CIW is an example of a possibility of confusion. The I has a peak motion and the A is a little more wavy. The Z was a long tailed motion--generally a kind of loop to begin with."

"When you take the blindfold off you feel you're completely engulfed in darkness--the darkness is syrupy dark."
COMMENTS FROM SUBJECTS ABOUT THE ELECTRIC SHOCK

The following comments from about one quarter of the subjects concerning the electric shock are typical of the comments received from all of the subjects.

"Shock interrupted me--interfered with the formation of letters...."

"The shock was very unpleasant; I got adapted to it towards the end."

"At first it was unpleasant--then very unpleasant--becoming more and more pleasant as I went on."

"The shock was somewhat unpleasant. I wondered whether you were trying to make me learn by punishing me. Are you trying to prove whether punishment helps or hinders learning?"

"At first the shock was much more unpleasant than at the last. If you know where and what your enemy is--it's a lot easier to fight."

"The shock was quite unpleasant. I thought you were giving the shock on a certain syllable--but then I discarded the hypothesis--there was no pattern to it, and that threw me off."

"The shock was something you could bear, but rather annoying after a while."

"It isn't the shock so much as it is my fear of it coming--I don't know why I'm laughing, it hurts."

"It (the shock) made me jump--but I don't think it was unpleasant." (This subject had a very high K score of 21)

"In some instances it speeded up my memory--other times it slowed me down."
APPENDIX C

DISCUSSION OF THE LITERATURE ON THE K SCALE
DISCUSSION OF THE LITERATURE ON THE K SCALE

The K Scale

McKinley, Hathaway, and Meeh1 originally introduced the K scale to the MMPI in an attempt to correct some of the MMPI scales that tended to be affected by what they conceived to be a person's attitude in taking the test. That is, individuals with certain specific types of diagnosed abnormalities tended to obtain "normal" scores on the particular scale or scales that should have indicated the individual's type of abnormality. The K scale thus served to raise the raw score on these scales. In general these were the scales that tended to be composed of items of a less subtle nature. In the process of studying the K scale itself the above authors found that with a sample of male college graduates it was correlated negatively with all but two MMPI scales. Wheeler et al.82 found very similar correlations with a group of 112 college students. These data are represented below.

TABLE 15

PEArSON PRODUCT-MOMENT CORRELATIONS OF THE K SCALE WITH THE OTHER MMPI SCALES FROM DATA BY Mc Kinley ET AL AND WHEELER

<table>
<thead>
<tr>
<th></th>
<th>Hs</th>
<th>D</th>
<th>Hy</th>
<th>Pd</th>
<th>MF</th>
<th>Pa</th>
<th>Pt</th>
<th>Sc</th>
<th>Ma</th>
</tr>
</thead>
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<tr>
<td>McKinley et al</td>
<td>-25</td>
<td>08</td>
<td>53</td>
<td>-09</td>
<td>-08</td>
<td>22</td>
<td>-65</td>
<td>-46</td>
<td>-42</td>
</tr>
<tr>
<td>Wheeler et al</td>
<td>-31</td>
<td>-07</td>
<td>50</td>
<td>-09</td>
<td>-16</td>
<td>19</td>
<td>-59</td>
<td>-51</td>
<td>-30</td>
</tr>
</tbody>
</table>

McKinley's sample: 100 employed male college graduates
Wheeler's sample: 112 male college students

The fairly high negative correlations of $K$ with most of the scales was consonant with the rationale for its introduction. The authors\textsuperscript{83} reasoned that $K$, as a suppressor variable, should not be especially related to any one type of pathology. The exception to this, of course, was the fairly high positive relation of $K$ to $Hy$ and the smaller positive relation of $K$ to $Pa$. Analysis revealed, however, that it was the non-somatic more subtle $Hy$ items ("zero" or "hy-subtle") that primarily contributed to the obtained positive correlations. These were the items that seemed "...to reflect the self deceptive and impunitive attitude of the hysterical temperament...."\textsuperscript{84} In addition, approximately one-fourth of the $Pa$ items are of the $Hy$-subtle type.

There is some evidence that $K$ is not related to intelligence. Meehl and Hathaway\textsuperscript{85} found that, with college applicants, $K$ and scores on the ACE correlated .04. Schmidt\textsuperscript{86} found that $K$ and the AGCT correlated .004 with "normals" in the Air Force who had a mean of 11.7 years of schooling. Meehl and Hathaway\textsuperscript{87} have also shown that $K$ does not seem to be related to age. There is general agreement, however,

\textsuperscript{83}P. E. Meehl and S. R. Hathaway, "The $K$ factor as a suppressor variable in the Minnesota Multiphasic Personality Inventory", \textit{J. Applied Psych.}, 1946, 30, p. 548.

\textsuperscript{84}Loc. cit.

\textsuperscript{85}Loc. cit.

\textsuperscript{86}Op. cit.

that college-educated persons generally obtain \( K \) scores from one-half to one standard deviation above non-college educated persons.\(^8\) Meehl and Hathaway\(^9\) suggest that this difference is most probably a function of socio-economic status.

"The mean raw score on \( K \) for a group of 18 normal subjects classified in Groups I and II in the Goodenough classification, who were not, however, college graduates or attending college, was 18.50, which corresponds to a \( T \) of 61. In spite of the small \( N \), this difference is great enough so that a \( t \) comparing their means with that of 156 unselected normals from other economic classes was highly significant. (\( t \) 6.055, \( p \) .01)"

Schmidt\(^90\) found that there was a correlation of .29 between \( K \) and size of home town. This offers further evidence of a cultural interpretation of \( K \).

Wheeler et al.\(^91\) subjected the MMPI to a factor analysis with the above-mentioned normal group and also a neuropsychiatric group, and found that two major factors emerged.

"The first factor has its maximal loadings on the \( Sc \) and \( Pt \) scales, showing respectively, values of .943 and .908....In contrast with these positive loadings, we find that the \( K \) scale shows a high negative loading of -.630.

"An interpretation of this factor in the light of these loadings would suggest that it indicates primarily concern with one's self.

\(^8\)McKinley et al, op. cit., p. 31.
\(^90\)Loc. cit.
The scales which are most heavily loaded, So and Pt, are two of the three commonly referred to as the psychotic triad, and seem to reflect the encapsulating withdrawal of a schizoid type including excessive concern with compulsive needs. The extremely high negative loading on the K scale would seem to indicate that when this factor is present to a marked degree in an individual, the usual ego defensive mechanisms are held in abeyance and the person now tends to show himself in the worst possible light.

"The second major factor has its maximal loadings on Hj (.780) and, interestingly enough, on K (.578). Other significant loadings on this factor occur on scales D, Pa, F, Pd, L, and He. This factor seems to reflect, on the basis of these loadings, the neurotic picture of adjustment. The high positive loading of K for this factor, as compared with the high negative loading of K for Factor I, implies that the ego defenses are intact. Perhaps one of these ego-defensive mechanisms is indicated by the positive loading of .510 on the Pa scale. This suggests that the paranoid projections serve more as a neurotic defense in the normal group than as a component in the schizoid pattern indicated in Factor I. We shall see in a moment that the Pa scale disappears from Factor II in the NP group and has a loading in Factor I."

**K as an Indicator of Good Adjustment**

Sweetland and Quay, in studying dream symbolism induced by hypnosis, to their surprise found that "...K correlated high (.72) with dream symbolization and the latter was produced only by well-adjusted people."\(^9^2\) The measure of adjustment was the Social Security Insecurity scale (SI) of Maslow,

Hirsh, Stein, and Honegman. The K scale and the SI scale were then given to two groups of college students. The correlations were .68 and .74.

"In a follow-up study, the hypnotic dreams were rated as being 'extrapunitive', 'intrapunitive', 'impunitive', and 'no feeling'. The correlations between these and the K scores were: extrapunitive -.81; intrapunitive -.33; impunitive -.20; and no-feeling .61. The no-feeling dreams were produced chiefly by the well adjusted subjects. The results suggest that K tends to be opposite from extrapunitiveness and closely associated with good adjustment.

"...Our interpretation differs somewhat from that of Wheeler et al. They interpret K as representing ego 'defense'. We believe that a more logical interpretation might be made by considering K as being one end of a continuum with Pt and So at the opposite end."

Gowan reports as follows:

"On the basis of other research findings on correlations between measurements on the K scale and other variables, and on the basis of factor analysis involving correlations between K and some 60 other variables which included the uncontaminated MMPI scales, the Calif. Psych. Inventory, the Guilford-Zimmerman, and the Gowan Teacher Prognosis Scale for the MMPI, it is suggested that--

(1) K represents more than a test-taking attitude.

(2) high K scores tend to distinguish individuals who are well-adjusted, responsible, controlled, possessed by a well-functioning ego, friendly, and non-extrapunitive.


(3) high K scores are rarely found in the psychotic triad.
(4) high K persons tend to be empathic, and to make good counselors and teachers.
(5) moderate elevation of K is no indication of an attempt to 'fake good'.
(6) this sign is a valid and widely reported test indicator of teaching potential."

K and the Taylor Manifest Anxiety Scale

The literature generally recognizes the fact that the Taylor scale and the Pt scale are measuring very nearly the same phenomenon, for they are usually highly correlated. It seems appropriate, however, to cite a study using a sample of college students for purposes of comparison with the results of the present study. Brockbill and Little\textsuperscript{95}, with a sample of 73 college students, found that the Taylor scale was highly correlated (.81) with the Pt scale. The Taylor scale also correlated -.56 with the K scale—a correlation very close to that of the present study (-.53).

K and the Deviation Hypothesis

Berg's\textsuperscript{96} deviation hypothesis states that persons who respond consistently against modal response preferences should display symptom patterns of abnormality, and that a tendency to deviate from the modal preference by responding true is


\textsuperscript{96}Op. cit.
associated with psychotic states, whereas a tendency to deviate from the modal preference by responding false is associated with neurotic states. Barnes\textsuperscript{97} tested the deviation hypothesis on the MMPI with a heterogeneous group of 40 males, including ambulatory psychotics, neurotics, and counseling cases. He found, as predicted, that the tendency to deviate by answering true to the MMPI statements was highly correlated with Pa, Pt, and Sc (psychotic triad), whereas the tendency to deviate by answering false was highly correlated with Ha, D, and Hy (neurotic triad).

The $K$ scale score, with one exception, is the sum of all the items on the scale that are marked false. One might argue, after considering the deviation hypothesis, that a person obtains a high $K$ score not because he is using a negation thought mechanism on these particular items, but rather because he has a general negative response bias. If such is the case, then one would expect the $K$ scale to be positively related to general biased responding in the false direction, However Barnes found, contrary to this idea, that $K$ correlated .06 with the deviant responders generally answering false; whereas $K$ correlated -.69 with those who deviated by answering true. This result lends further support to the general suggestion that $K$ is measuring something opposite to the MMPI.

\textsuperscript{97}Op. cit.
psychotic response pattern.

Negative response bias, incidentally, has also been recently studied using an inventory made up of "neutral" and "innocuous" items98 that make no reference to the personality of the testee, and thus make no demands upon him for self evaluations. It seems clear that negative response bias to this type of material has a distinctly different meaning than negative response bias to an inventory such as the MMPI. General negative responding to an inventory of innocuous items might suggest a trait of negativism whereas general negative responding to statements about many types of personality weaknesses might well be labeled as maladaptive, indiscriminate, and pervasive defensive thinking.

BIBLIOGRAPHY

LIST OF WORKS CITED


Theory

Modern psychoanalytic theory has been primarily concerned with ego functions. Negation is thought to be one of the most basic ego functions—if not the most basic ego function. Freud first introduced the concept in 1915 with his paper, "The Unconscious", and then further developed it in his paper entitled "Negation" in 1925. Jones and Spitz have both made recent theoretical contributions that serve to clarify and extend the meaning of the concept. Basically, negation, as a thought mechanism, serves adaptation by allowing a repressed or inhibited idea to enter consciousness to be used for consciously acceptable purposes, on the condition that the idea is consciously disbelieved. The mechanism of negation tends to allay the painful affect or anxiety that is connected with an unacceptable idea.

Jones, Slack, and Grieve have attempted to invoke a negation response set in an individual and broadly predict the nature of his responses to the WAT, TAT, and also to interviews. Results were all consistent with the concept of spontaneous negation; but there remained the question of whether or not the concept of negation was the most parsimonious explanation. The present study was designed in such a way that negation would best explain the predicted
results.

**Hypotheses**

Three hypotheses were generated from the concept of spontaneous negation.

The first hypothesis stated that the response probability of painful verbal material that is associated with the defense mechanism of simple inhibition under an invoked affirmation response set will increase when the invoked affirmation response set is altered to that of an invoked negation set.

A second hypothesis stated that the response reaction time of inhibited painful material should decrease with the altered set.

A third hypothesis stated that there would be individual consistency in defensive operations on different levels of psychic organization. That is, individuals who tend to inhibit painful material under affirmation, will tend to negate the material under negation, and will tend to evidence general defensive thinking with an independent measure.

**Design**

Each subject was asked to complete a forty-seven item inventory that included the K scale of the MMPI and the Taylor Manifest Anxiety scale. General defensive thinking was defined as an elevated score on the K scale.

Each of 48 subjects learned two lists of six nonsense
syllables to an identical criterion. One list was then associated with 30 electric shocks as the subject wrote the list 15 times. The other list had no shock while being written 15 times. Painful and neutral verbal material were defined as syllables associated with shock and syllables not associated with shock.

Twenty-four hours later the subject was exposed to an autokinetic (stationary) light, and informed that the experimenter was going to move the light through space and write syllables from the list of twelve syllables that were learned the day before. The subject was asked to respond with the syllable that was being written with the light on each of 20 trials (affirmation response set). Each subject was then asked to respond with a syllable that definitely was not being written on each of 20 trials (negation response set).

Results

The first hypothesis was supported with little room for doubt. The second hypothesis barely missed a conventional level of confidence, but other evidence tended to provide added support for this hypothesis. The third hypothesis was also supported.

The general implication of the results is that an invoked negative set tends to allow ordinarily inhibited painful verbal material to enter consciousness. In addition there is
consistency in defensive verbal behavior on different levels of mental organization.
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I worked for the New England Confectionary Co. for the next two and one half years in the capacity of an industrial engineer.

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