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An Experimental Investigation of the Relationship between the Galvanic Skin Response and Stimulus Words Related to Religious Values

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**AN EXPERIMENTAL INVESTIGATION OF THE RELATIONSHIP
BETWEEN THE GALVANIC SKIN RESPONSE AND
STIMULUS WORDS RELATED TO RELIGIOUS VALUES**

By

Bernard G. Suran, O.P., M.A., Ph.L.

**A Dissertation Submitted to the Faculty of the Graduate
School of Loyola University in Partial
Fulfillment of the Requirements
For the Degree of Master
of Arts**

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1966

PREFACE

It is a full two hundred years since Henri Rousseau mouthed the dictum that would echo so infamously throughout the halls of social history: "Man is born free, and everywhere we find him in chains." And yet, man is not born free; it is difficult to understand how anyone who has witnessed the total helplessness of a newborn babe could be tempted to wax eloquent about his freedom. Freedom, if anything, is an achievement, not a given. To attribute freedom to a mature adult is hazardous; to attribute it to an infant is absurd.

A much more sober evaluation of human freedom is proposed by B. F. Skinner: "The hypothesis that man is not free is essential to the application of scientific method to the study of human behavior. The free man who is held responsible for his behavior . . . is only a prescientific substitute for the kinds of causes which are discovered in the course of scientific analysis. All these alternative causes lie outside the individual" (1953, p. 447). There is no room for such a belligerent variable as free will in Skinner's system; nor is there any room for the human person in his society.

The more sophisticated advocates of free will have always tended toward a more moderate position. The root of freedom, the power to choose ends and act upon them, is in every man, but effective freedom functions

only under certain optimal conditions. Free behavior is seen as a continuum ranging from fully determined conditioned actions at one pole to fully free human acts at the other pole, with the majority of human activities falling into that vast penumbral area between.

The attitude that one assumes toward the problem of human freedom has far-reaching repercussions in the social and moral spheres. Civil society, motivated by a humanistic ethics, is dependent upon the not so tenuous assumption that man is responsible for his behavior. The Christian moralist, when he attempts to evaluate a human act, is faced with the problems of sufficient knowledge and full consent of the will. Neither legal nor moral analysis can function autonomously outside the framework of a psychology of man. Both religious and legal ethics draw their principles from psychology, and it is to psychology that they must turn for the ultimate answers concerning human freedom and for the analytical tools to deal with the problems in their own respective spheres.

There is a certain irony here, for the experimental psychologist has concerned himself not so much with the problem of how persons are free as with how they are determined. He studies the functional relationships between variables. He attempts to discover the manner in which determinisms are "written into the nervous system." And yet, this is not rhyme without reason, for freedom is certainly a function of the complex of determinisms which the person has acquired and the extent of his insight into these determinisms.

This study deals with one small facet of human determinism, the functional relationship between the galvanic skin response and stimulus words related to religious values. It further deals with an analytical tool for analyzing human freedom and motivation, the hypothetical construct of "value." Both the theory proposed and the research conducted are modest indeed, but it is only through such modest researches that man can ever hope to understand the complex of causes which govern his behavior.

The author would like to acknowledge a special debt of gratitude to Reverend Vincent V. Herr, S.J. whose advice, direction, and generosity of time and effort made this research possible. No greater testimony of man's ability to initiate, control, and guide his own behavior will ever be found than the witness of Father Herr's consummate patience with this author.

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CHAPTER I

INTRODUCTION

Few enterprises in the history of man's quest for knowledge have been as punctuated with controversy and conflict, with disagreement and dissidence, as has that department of science that is incongruously known as psychology. The discordant themes populating the history of psychology even to the present day have been a scandal to some of the more sober-minded members of the scientific disciplines. A random selection of almost any aspect of psychology's unwieldy subject matter (presuming, of course, that a consensus could be obtained as to the nature of that subject matter) will reveal a dozen divergent positions advocated by the foremost luminaries in the field. This situation obtains marvelously well in contemporary motivational theory, and there is certainly no dearth of argument and criticism among the present crop of motivational theorizers.

A recent textbook, eight hundred and more pages, which summarizes contemporary theory and research in motivation concludes with the plaintive jeremiad: "It is clear that a comprehensive, definitive psychology of motivation does not yet exist" (Cofer and Appley, 1964). The reasons for this sad state of affairs are many and varied, the most obvious being that human motivation is as complex as human personality itself. Furthermore, motivation is a problem that is difficult to deal with "head

on" and is often approached obliquely.

Sooner or later, however, every student of human behavior finds himself dealing with the problem of why people behave as they do. This simple "why" is the basic question in the problem of motivation. Without oversimplifying complex issues and without drawing any hard and fast distinctions, I would suggest that the most valuable approaches to the "why" of behavior have emerged not from any explicit theory of motivation but from more or less distinct areas in contemporary psychology, namely learning theory and personality theory.

The learning theorists have proudly worn the badge of the "tough-minded." Their use of classical experimental methodology and carefully controlled research-- has contributed many valuable conceptual tools for dealing with the problem of motivation. Beginning with Thorndike's law of effect, many of the constructs postulated by the learning theorists have been equally significant for motivational theory. Purposive behavior, primary and secondary drives, operant and respondent behavior, incentive, goal gradients -- all these terms have a motivational flavor, and the learning theorists have taught us much about the acquisition of motives. True to their methodology, they have hypothesized constructs only as necessary, have remained close to the confines of the immediate data, and have refrained from asking the broader questions about human nature itself.

The personality theorists, on the other hand, have been less aloof

in waxing philosophical. Few have been laboratory men; their method, in the main, has been empirical rather than experimental. Many personality theorists have been clinicians faced with the pressing problem of human need and suffering. Impatient with the tedious methods of careful scientific methodology, they have struck out on their own, leaving the confines of validated fact behind them. From the birth of psychoanalysis to the present day, the methods and theories that have sought to give an over-all view of human personality have been imaginative, stimulating and insightful. Not all of them, however, have been easily amenable to experimental investigation.

Among those personality theories that have been as heuristic as imaginative is that of Gordon Allport. Allport's theory of personality is candidly motivational, flavored with many motivational constructs such as value, interest, sentiment, intention, terms which he often uses interchangeably. These constructs are used by various theorists, and Allport seems willing to accept them all insofar as they represent the same sort of emphasis. The main thrust of his thought is clear. His intent is to raise a critical voice in the face of the irrationalistic and blind impulse theories of motivation that have dominated American psychology in the last half century. He insists that personality is not controlled solely by pushes from the past but rather by pulls from the future.

Emphasizing the dynamics of futurity, Allport contends that in order to understand a person it is necessary to see him in the light of what he

holds to be worthwhile, who he is striving to become. The Harvard psychologist stresses the construct of value as one of the most meaningful analytic units for the study and understanding of personality. In a general way, Allport defines value as "anything that yields a satisfaction or provides a means for such satisfaction" (Allport, 1950, p. 13). The "values" of the infant are mainly viscerogenic, but in the course of growth and adjustment psychogenic values gradually emerge. Following Stern, Allport has delineated six major value areas that influence human behavior in a more or less consistent fashion: theoretical, economic, aesthetic, social, political and religious. For Allport, a major value area is "a belief upon which a man acts by preference. It is thus a cognitive, a motor, and above all, a deeply propiarte disposition" (Allport, 1961, p. 454). In Allport's theory, values are postulated as central cognitive affective constructs that initiate and guide human behavior.

Allport himself has been especially concerned with the nature of religious values or sentiments. He defines religious value as a "disposition, built up through experience, to respond favorably, and in certain habitual ways, to conceptual objects and principles that the individual regards as of ultimate importance in his own life, and as having to do with what he regards as permanent or central in the nature of things" (Allport, 1950, p. 56).

Although he has helped to develop a very useful practical tool for the study of values (Allport, Vernon, Lindzey, 1960), Allport's treatment

of the nature of values has been almost wholly theoretical. On the practical experimental level there has for some years been raging a controversy which concerns the very validity of the value construct. The following chapter reviews the literature pertinent to this controversy and furnishes the background for my own experimental research.

CHAPTER II

A REVIEW OF THE RELATED LITERATURE

This study is specifically concerned with the functional relationships that exist between subjects of high religious value strength and autonomic responsivity to stimulus words related to the religious value area under varying conditions of experimental involvement in the religious value. The meaningfulness of various stimulus words will be measured by the galvanic skin response (GSR). The literature related to this study will thus fall into two main classes: general literature in the psychology of motivation and religion and the more pertinent experimental literature dealing with values and GSR research.

General discussions of the various theoretical viewpoints on the nature of motivation can be found in McClelland (1951), Lindzey (1958), and Chaplain and Krawiac (1960). The Nebraska symposia on motivation provide an excellent summary of contemporary research areas (Jones, 1954 and Levine, 1964), and Cofer and Appley (1964) give a complete and comprehensive review of both theory and research. The theoretical framework of the value-centered approach to motivation is best described by Allport (1943, 1946, 1953, 1955, 1961). A recent article by Dember (1965) summarizes a new look in motivation that has emerged from the study of motivational and cognitive variables.

There is relatively little experimental literature in the psychology of religion that is directly pertinent to this study, and there seems no point in duplicating the excellent summaries of the general literature that are already available, for example that of Meissner (1961). Probably the best introduction to the problems of religious psychology is that of Clark (1958). The most systematically integrated approaches to the psychology of religion are those of Allport (1950) and Herr (1964).

We have already noted that for Allport religion as a value is a blend of both cognitive and motivational variables. Herr (1964, p. 64) likewise insists on the distinction between knowledge and motive power, noting that both factors must be operative in morally responsible behavior. As a general principle of motivation, Herr states that "As soon as there is clear understanding of the fact that a certain object is valuable, then there is aroused a tendency toward that object quite spontaneously, that is, previously to reflection and deliberation" (Herr, 1964, p. 111). Interestingly enough, the experimental literature relevant to this study has also been primarily concerned with the relationship between cognitive and motivational variables.

The problem of the value construct was brought into the experimental laboratory some fifteen years ago when psychologists began attempting to assess the effects of cognitive and motivational variables on perception.

¹For a review of this literature see Dember (1960).

A new and exciting research area, which soon became known as "The New Look in Perception," was opened up by the controversial researches of Postman, Bruner, and McGinnies (1948). Using the Allport, Vernon and Lindzey Study of Values as a quantitative measure of value areas, they claimed that subjects recognize words related to their dominant interests or value areas more readily than other words. Vanderplas and Blake (1949) likewise reported a positive relationship between an individual's hierarchy of personal values and the ease with which he recognizes stimulus words related to his values. Negative findings, however, were reported by Mausner and Siegel (1950) whose researches failed to support the hypothesis that ease of perception is a function of value. In each of these studies, value was treated as an independent variable and ease of perception was the only dependent variable studied. No attempt was made to measure autonomic discrimination, and the ease of perception factors constituted the only evidence that related to the validity of the value construct.

A slightly different tack was taken by Bousfield and Samborski (1955). They attempted to correlate personal values with the meaningfulness of stimulus words related to the value areas. Defining "meaningfulness" as the frequency of written associations to stimulus words given within a prescribed time, they found that relative strength of values correlated positively with the meaningfulness of words related to the values (see Tables 1 and 2). Solomon and Howes (1951), on the other hand, studying both word frequency and visual duration thresholds, found

Table 1

VALUE-WORDS SELECTED BY BOUSFIELD AND SAMBORSKI (1955)

AESTHETIC	ECONOMIC	POLITICAL	RELIGIOUS	THEORETICAL	SOCIAL
art	business	dictator	blessing	analysis	companion
beauty	commerce	domination	deity	discovery	cordiality
elegance	economics	fame	faith	laboratory	conversation
landscape	finance	government	holiness	learning	familiarity
music	income	king	piety	logic	family
opera	industry	leader	prayer	reason	fraternity
ornament	investment	politics	religion	research	friend
poetry	property	president	reverence	science	generosity
sculpture	utility	superiority	spirituality	theory	kindness
symphony	wealth	victory	worship	truth	sociability

Table 2

PRODUCT-MOMENT CORRELATION COEFFICIENTS BETWEEN RANKS OF
COMPOSITE MEANINGFULNESS SCORES AND SCORES ON THE
STUDY OF VALUES SCALE FOR EACH OF SIX VALUES
(BOUSFIELD AND SAMBORSKI)

VALUE	r	P
AESTHETIC . . . . .	.12	.30 > P > .20
ECONOMIC . . . . .	.20	.10 > P > .05
POLITICAL . . . . .	.16	.20 > P > .10
RELIGIOUS . . . . .	.39	P < .001
SOCIAL	-.02	.90 > P > .80
THEORETICAL . . . . .	.37	P < .001

that personal values correlated positively with word frequency and negatively with visual duration thresholds. They concluded that the Allport-Vernon-Lindzey test is merely a measure of the frequency with which the subject uses certain words. They further concluded that there is no need to postulate any vague entity like "value;" the only difference between two populations is the frequency with which they use the two sets of words. Correlations of a test constructed by Brown and Adams (1954) with the Allport-Vernon-Lindzey scale, however, remained significantly positive even with changes in word frequency. Thus, they conclude that value is not merely a function of word frequency and that the postulation of value as a central cognitive affective construct is valid.

Nevertheless, it has been objected that none of the evidence, positive or negative, amassed by these researches has any real bearing on the problem of the value as an explicitly motivational construct. All of these researches seem to be mainly concerned with cognitive variables. Experiments which attempt to correlate strength of values with word frequency are probably only testing familiarity. Thus, the greater a person's interest in religion, the more likely he is to read religious literature. We should expect that he will be able to give a large number of word associations to stimulus words related to his religious value. The factor of learning and familiarity is likewise crucial when experimenters attempt to correlate personal values with ease of recognition of words related to the values. The more extensive the experience which a person has of an object, the more the cues can be reduced and still per-

mit recognition (Woodworth and Schlosberg, 1954, p. 104).

This is a common criticism that is leveled at these researches especially by Solomon (1951). Undoubtedly, familiarity is an important factor, but I question Solomon's conclusion that the Allport-Vernon-Lindzey test is merely a measure of the frequency with which the subject uses certain words. The more basic question seems to be why the subject is more familiar with one set of words rather than another. To contend that familiarity is a function of learning is, of course, quite obvious and is at the same time quite circular. After all, the Allport-Vernon-Lindzey test is an attempt to measure choices, preferred patterns of behavior. The value theorists do not deny that values are acquired through experience. The point of the Allport-Vernon-Lindzey scale is that the individual is here and now opting for specific interests and behavior in a more or less consistent fashion. Thus, the test attempts to distinguish between what are merely matters of fact to the subject and what are matters of importance to him. When a subject consistently opts for a particular interest, the theorists conclude that it is valid to postulate a construct such as value to account for a contemporary system of motivation within the personality structure of the individual which influences him to choose one alternative rather than another.

Experiments which seek to correlate personal values with the frequency of written associations to stimulus words related to the values do no more than provide another avenue for assessing the value. Bousfield

and Samborski (1955) are correct, I believe, in defining the frequency of written associations to a given stimulus word as "meaningfulness," for valuation is precisely meaningfulness, i.e., that which is worthwhile to the individual. Such experiments do not in themselves constitute a "proof" of the value; they simply indicate a particular line of evidence which supports the validity of the value construct. The problem for the experimenter is to provide various approaches to "meaningfulness." It is only through repeated experimentation, alternation in experimental design, and the manipulation of independent variables that it is possible to determine which factors account for differences in results and the concomitant validity of constructs postulated. Constructs are verified only through the gathering of independent evidence.

One type of independent evidence that has not been systematically utilized in value research is the use of physiological indices such as the galvanic skin response (GSR). Without entering into all the controversies concerning the merits and demerits of GSR research, one can safely conclude, as do Woodworth and Schlosberg (1954), that GSR is a valid indicator of the extent to which a given stimulus arouses a subject. Thus, GSR can provide an alternate approach to the problem of the "meaningfulness" of a given stimulus word. The assumption that verbal associations to stimulus words in GSR research is a valid experimental technique is borne out by the findings of Herr and Kobler (1957). They have concluded that stimuli in GSR research have a constant value regardless of the personality of the subject.

We shall not here review the excellent summaries of GSR research already available. Woodworth and Schlosberg (1954) provide an invaluable general discussion of the GSR, and the physiological mechanisms involved are treated by McCleary (1950). Discussions of the problem of unit of measurement in GSR research can be found in Herr and Kobler (1953) and Flanagan (1962). Both of these reviews analyze and criticize the Haggard transformation (Haggard, 1949a and 1949b) which will be used in this study.

In an attempt to supply independent evidence for his construct of "perceptual defense," a motivational construct closely linked to the notion of value, McGinnies (1949) showed that taboo words evoked a significantly greater GSR than neutral words. Even when the subject reported that he did not recognize the word, there were strong GSRs to taboo words. Lazarus and McCleary (1951), using emotionally conditioned nonsense syllables rather than taboo words as the critical stimuli, found that the critical syllables gave significantly larger GSRs than the neutral ones even when they were not recognized. Lazarus and McCleary contend that their experiment furnishes evidence of "subception," autonomic discrimination without awareness. In other words, the authors experimentally induced a "value" in their subjects by emotionally conditioning the subjects (through electrical shocks) to certain nonsense syllables. It will be noted that the "value" in this experiment was a constant, and the independent variable was the type of stimuli: half of the stimuli were critical (subjects had been emotionally conditioned to the critical

syllables through shock) and half of the stimuli were neutral (subjects had not been emotionally conditioned to the neutral syllables through shock). This experiment thus suggests the possibility of an indirect approach to the problem of values: holding the value itself constant and presenting two types of stimulus words to the subject with half of the stimulus words related to the value and the other half neutral.

Various studies have attempted to assess the effect of level of involvement upon physiological variables. Mandler, et. al. (1961) has shown that a subject who successfully avoids personal involvement in a stimulus situation shows less physiological response to the stimulus. White's researches indicate that autonomic responsivity varies positively with level of subject involvement (defined in terms of stimulus discrimination complexity), at least with low anxiety subjects (White, 1965). These researches suggest a technique that may prove useful in value research, namely varying the level of involvement in the value and recording GSRs to stimulus words at these different levels of involvement.

It would be well at this point to summarize the main points which I have tried to bring out in this review of the literature.

- 1) The general problem of the validity of the motivational construct of value remains unresolved at the experimental level. A considerable amount of evidence still needs to be amassed before the construct can be validated or invalidated. No single piece of research is in any way de-

finitive. The solution to the problem lies in providing various experimental designs which approach the problem from different avenues.

2) The use of stimulus words related to personal values is a valid experimental technique, and the meaningfulness of a stimulus word is a valid indicator of value. Meaningfulness implies valuation.

3) GSR is a valid indicator of meaningfulness, and autonomic discrimination functions even without awareness.

4) Researches which deal with values in terms of the frequency of associations with (or ease of recognition of) words related to the values are subject to the criticism that the only thing they are measuring are cognitive factors, namely familiarity. The criticism is not, I think, altogether justified because familiarity itself is an indication of value. Nevertheless, the criticism must be contended with. One way of handling the objection is by treating the value as a constant (and thus controlling for familiarity) and varying level of involvement in the value itself. The problem with such a design would be that no direct conclusions could be drawn concerning the nature of the value. Positive findings would lead to a discussion of the involvement factor which would, of course, be related to the value. Since this is the procedure followed in my design, I will take up this problem in my discussion of the results.

CHAPTER III

PROCEDURE

This experiment is designed to test two distinct hypotheses:

Hypothesis 1: Subjects of high religious values will give significantly greater GSRs to stimulus words related to the religious value than to neutral words.

Hypothesis 2: Subjects of high religious values who are experimentally involved in their religious values will give significantly greater GSRs to stimulus words related to their values than subjects of high religious values who are not experimentally involved.

The key problem in the design of this experiment is to isolate and manipulate level of involvement in religious value as an independent variable. The problem was handled by using matched groups of subjects and challenging the religious value system of one of the groups.

Subjects

All subjects in this experiment were male clerical students in a large religious order. Subjects were matched on the critical variables and divided into two groups, an experimental group (Group A) and a control group (Group B). Group A was exposed to the involvement factor, an essay on clerical involvement constructed by Rev. Vincent V. Herr, S.J.

and revised by this experimenter, whereas Group B read a neutral essay. Both groups were administered the same list of stimulus words and instructed to free associate with each word. The experimenter recorded verbal responses on a data sheet and autonomic responses were recorded on the psychogalvanometer.

The experimenter began with an original population of 102 students. In session 1, all subjects were administered the Allport-Vernon-Lindzey Study of Values (1960). In session 2, all subjects were administered the Nicolay-Walker Personal Reaction Schedule (see bibliography 44., n.d.). Since anxiety level has been shown to have a differential effect upon level of involvement, it was necessary to match subjects on the anxiety factor.

After analyzing the results of these tests, subjects were matched on the critical variables and then randomly assigned to the experimental and control groups. Subjects were matched on the following variables:

- 1) Score on the religious factor in the Study of Values (see Table 3);
- 2) Total anxiety score on the Personal Reaction Schedule (see Table 4);
- 3) Age -- since all subjects were from a homogeneous age group this control easily lent itself to the design (see Table 5);
- 4) Number of years in religious life (see Table 6).

Table 3
DESCRIPTION OF SUBJECTS:
SCORES ON STUDY OF VALUES

VALUE AREA	EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)	
	Mean	SD	Mean	SD
Religious	56	3.1	55	3.8
Aesthetic	37	8.9	35	6.2
Economic	27	7.1	30	7.7
Political	37	4.2	38	5.4
Theoretical	40	6.0	36	6.3
Social	42	7.4	43	5.4

Table 5
DESCRIPTION OF SUBJECTS:
AGE

	EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)	
	Mean	SD	Mean	SD
	24	2.4	25	2.4

Table 4

**DESCRIPTION OF SUBJECTS:
SCORES ON THE PERSONAL REACTION SCHEDULE**

SCALE	EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)	
	Mean	SD	Mean	SD
Total Anxiety	25.00	6.6	25.95	8.4
Motor Tension Anxiety	9.35	3.2	9.45	2.8
Object Anxiety	6.35	2.0	7.45	2.4
Personal Inadequacy Anxiety	9.30	3.2	9.45	3.4
Social Desirability	18.10	3.2	17.75	4.8

Table 6

**DESCRIPTION OF SUBJECTS:
NUMBER OF YEARS IN RELIGIOUS LIFE**

EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)	
Mean	SD	Mean	SD
3.85	1.9	4.10	1.9

From the original population of 102 students, the experimenter was able to select two matched groups consisting of 26 subjects in each group. Subjects were matched on the aforementioned variables and randomly assigned to the experimental and control groups. The matching presented little difficulty since most subjects scored high on the religious factor and since the original population was rather homogeneous in regard to age and religious education.

During the course of the experimentation six subjects had to be eliminated from each group for such reasons as inability to obtain a basic conductance reading and inability to match subjects on responsivity. The final experimental population consisted of 20 subjects in the control group and 20 subjects in the experimental group. Thus, the experimental and control groups consisted of matched pairs of subjects.

Selection of Stimuli

The verbal stimuli in this experiment consisted of 16 stimulus words, 8 of which were related to religious values and 8 of which were neutral words. The neutral words were common neutral stimuli used in GSR research. The words related to religious values were drawn from the study conducted by Bousfield and Samborski (1955), with three additions made by this experimenter.¹

¹See p. 9, Table 1.

The essay on clerical involvement was prepared by Rev. Vincent V. Herr, S.J. and revised by this experimenter. The involvement essay incorporates a number of statements used by this experimenter in a pilot study that attempted to assess the effectiveness of statements that challenge religious faith for eventual use in GSR research. The attempt to use challenging statements as discrete stimuli was discarded because it was impossible to ascertain whether the subject was responding to the statement as a complete thought or to a particular word in the statement. It was decided instead to use a complete essay as one involvement factor within the general experimental context of the presentation of stimulus words.

The neutral essay was constructed by this experimenter. It is approximately the same length as the involvement essay and was administered to the control group as a control for the involvement essay. Both of these essays are reproduced in Appendix I and Appendix II of this paper.

Experimental Situation

In session 3, each subject individually underwent the GSR test. Subjects were tested according to the following sequence: ABBA, RAAB, ABBA, etc. After the electrodes for the psychogalvanometer had been mounted, a seven to ten minute adaptation period was observed. The subject was then instructed to give a single word verbal response to each of the stimulus words as they were presented. The stimulus words were presented verbally by the experimenter, alternating neutral and critical

items. At the completion of the eighth stimulus word, the independent variable was introduced. When the subject had finished reading the essay, a short adaptation period was again observed. The remaining eight stimulus words were then presented, again in alternating fashion. A series of four neutral words were presented to the subject before beginning the experiment to help the subject adapt to the situation. GSRs were not recorded for these adaptation words. The entire testing session averaged fifteen to eighteen minutes. The order of the presentation of the stimuli is depicted on the following page.

A continuous photographic recording was made of the skin resistance. The psychogalvanometer was a constant-current, critically-damped type, based on the Wheatstone bridge model. The apparatus also included a simple telegraph key attached to the psychogalvanometer for the purposes of recording reaction times of the subjects to each stimulus word.

Table 7

Order of the Experiment

Adaptation Stimuli:

COUNTRY

SHOE

WINDOW

BIRD

Test Stimuli:

Experimental Group

STREET

FAITH

CLOCK

PRAYER

SAND

SPIRITUALITY

BELL

PRIEST

Involvement essay

GLASS

WORSHIP

TREE

HOLINESS

CHAIR

RELIGION

FLOWER

GOD

Control Group

STREET

FAITH

CLOCK

PRAYER

SAND

SPIRITUALITY

BELL

PRIEST

Neutral essay

GLASS

WORSHIP

TREE

HOLINESS

CHAIR

RELIGION

FLOWER

GOD

CHAPTER IV

ANALYSIS OF THE DATA

It will be recalled that the design of this experiment included two independent variables: the neutral word -- critical word variable and the neutral essay -- involvement essay variable. Since the design of this experiment does not permit a facile separation of the effects of these two variables, the interplay of the two variables must be taken into account in assessing the results.

Computation of Scores

Raw scores were computed by a direct metric measurement of the resistance change of each subject for each word as represented on the film record. Each GSR raw score thus represents the length of the drop in millimeters.

The ohms resistance change (the drop) is equal to the raw score X 22.74 ohms. Ohms resistance change in itself, however, does not take into account the basic resistance of the subject, a fact which renders the comparison of ohms resistance changes between subjects somewhat questionable. A drop of 500 ohms resistance in a subject who has a 10,000 ohms basic resistance is not equivalent to a drop of 500 ohms in a subject who has a 20,000 ohms basic resistance. In order to compare the GSRs of two different subjects to the same word or the GSRs of one sub-

ject on different stimulus words, it is necessary to select a measure that takes account of basic resistance as well as ohms resistance change.

Since the GSRs of both the experimental and control groups satisfied the normal distribution requirements of the Haggard transformation scale, this measure was adopted for use in this experiment and all the data reported is in terms of the Haggard transformed scores. These converted scores are in $\frac{\log \text{ ohms} + 1.29}{\text{Basics}} \times 10^4$ units. Discussions of the Haggard transformation can be found in Haggard (1949), Herr and Kobler (1953), and Flanagan (1962).

Quantitative Analysis of Results

In the first half of the experiment, both the experimental and control groups were subject to the same experimental conditions. Since subjects were matched as pairs on all the critical variables, including responsivity, we are dealing with correlated means (Scott and Wertheimer, 1962, pp. 258 ff. and Garrett, 1958, pp. 226 ff.). Table 8 presents the mean GSRs, standard deviations, and the analysis of the significance of the difference between the means of the experimental and control groups for each of the first eight stimulus words.

An examination of Table 8 will reveal that there are no significant differences between the means of the experimental and control groups in GSRs to the first eight stimulus words. Thus, in the first part of the experiment the two groups of subjects are matched on autonomic respon-

Table 8

A COMPARISON OF THE DIFFERENCES IN THE MEANS FOR GSRs
TO THE FIRST EIGHT STIMULUS WORDS
IN THE EXPERIMENTAL AND CONTROL GROUPS

STIMULUS WORD	EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)		Mean Difference	t*
	Mean	SD	Mean	SD		
STREET	501	161	503	171	-2	0.06
FAITH	546	103	542	161	+4	0.14
CLOCK	469	195	478	164	-9	0.22
PRAYER	529	139	543	165	-14	0.39
SAND	365	199	383	165	-18	0.61
SPIRITUALITY	549	148	526	191	+23	0.64
BELL	463	173	446	207	+17	0.38
PRIEST	511	84	474	159	+37	1.17

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level; t of 2.54 significant at 2 per cent level; t of 2.09 significant at 5 per cent level.

sivity. This is an important point because any significant differences that may arise in the second half of the stimulus list can only be attributed to the neutral essay -- involvement essay variable. All other factors were held constant.

A better appreciation of the equivalence of the two groups on autonomic responsivity to the first eight stimulus words can be gained by conducting an analysis of the significance of the differences between the two groups on total responsivity to the respective sets of critical and neutral stimulus words in the first half of the stimulus list. Thus, it is possible to summate GSRs of each subject to the four critical stimulus words: FAITH, PRAYER, SPIRITUALITY, PRIEST. The same can be done for the GSRs of each subject to the four neutral stimulus words: STREET, CLOCK, SAND, BELL. Group means can then be determined for the total responsivity of each group to each set of stimulus words; an analysis of the significance of the difference between the means of the experimental and control groups for each set of stimulus words is presented in Table 9.

An examination of Table 9 will reveal that there are no significant differences between the experimental and control groups in the means for total autonomic responsivity to the respective sets of critical and stimulus words in the first half of the stimulus list. The two groups are equivalent in autonomic responsivity prior to the introduction of the neutral essay -- involvement essay variable.

The second part of the experiment consisted of the presentation of the neutral essay to the control group and the involvement essay to the experimental group, followed by the presentation of the second half of the stimulus list. An analysis of the significance of the difference between the mean GSRs of each group to the stimulus words in the second

Table 9

A COMPARISON OF THE DIFFERENCES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS IN THE MEANS FOR TOTAL AUTONOMIC RESPONSIVITY TO THE NEUTRAL AND CRITICAL STIMULUS WORDS IN THE FIRST HALF OF THE STIMULUS LIST

	EXPERIMENTAL GROUP (N=20)	CONTROL GROUP (N=20)			
	Mean	Mean	Mean Difference	S _{MD}	t*
Neutral Stimulus Words	1800	1826	-26	68	0.38
Critical Stimulus Words	2136	2083	+53	89.5	0.59

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level; t of 2.54 significant at 2 per cent level; t of 2.09 significant at 5 per cent level.

half of the stimulus list will determine the functional relationship between type of essay and GSRs to the stimulus words. Table 10 summarizes the important data for each stimulus word.

An examination of Table 10 will reveal that the means for the control group on each of the eight stimulus words are smaller than the means for the corresponding stimulus word in the experimental group. Three of the four neutral stimulus words (GLASS, TREE, FLOWER) produced no signif-

Table 10

**A COMPARISON OF THE DIFFERENCES IN THE MEANS FOR GSRs TO THE
SECOND EIGHT STIMULUS WORDS
IN THE EXPERIMENTAL AND CONTROL GROUPS**

STIMULUS WORD	EXPERIMENTAL GROUP (N=20)		CONTROL GROUP (N=20)		Mean Difference	t*
	Mean	SD	Mean	SD		
GLASS	432	211	358	144	†74	1.32
WORSHIP	469	155	360	179	†109	2.32
TREE	395	173	359	190	†36	0.81
HOLINESS	465	161	408	202	†57	1.68
CHAIR	424	189	287	207	†137	2.69
RELIGION	473	152	338	211	†135	3.78
FLOWER	326	187	300	192	†26	0.72
GOD	518	155	405	203	†113	2.36

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level; t of 2.54 significant at 2 per cent level; t of 2.09 significant at 5 per cent level.

ificant differences between the experimental and control groups. The fourth neutral word (CHAIR) produced a difference that was significant at the 2 per cent level. The difference between the experimental and control groups on this word can be attributed to the fact that the mean GSR for the control group was very small.

On the other hand, three of the four critical stimulus words evidence a significant difference between the experimental and control groups: WORSHIP was significantly different at the 5 per cent level; RELIGION was significantly different at the 1 per cent level; GOD was significantly different at the 5 per cent level. The stimulus word HOLINESS did not result in a significant difference between the two groups. It will be noticed that the lack of a significant difference for this word is mainly due to the fact that the mean GSR of the control group was quite large, as compared with the mean GSRs of the same group to the remaining stimulus words.

To gain a better appreciation of the specific effects of the type of essay on the magnitude of the GSRs to the stimulus words presented after the reading of the essay, it will be useful to do an analysis of difference between the two groups of the total responsivity of the subjects within each group to the respective sets of critical and neutral stimulus words in the second half of the stimulus list. Thus, the GSRs of each subject can be summated for the words WORSHIP, HOLINESS, RELIGION, GOD, and they can be treated as one global autonomic response. Group means can then be determined for the total responsivity of each group to the entire set of stimulus words. The same procedure can be utilized for the neutral words GLASS, TREE, CHAIR, FLOWER. Table 11 summarizes this data.

It will be noticed that there are significant differences between the experimental and control groups for both sets of stimulus words. For

Table 11

A COMPARISON OF THE DIFFERENCES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS IN THE MEANS FOR TOTAL AUTONOMIC RESPONSIVITY TO THE NEUTRAL AND CRITICAL STIMULUS WORDS IN THE SECOND HALF OF THE STIMULUS LIST

	EXPERIMENTAL GROUP (N=20)	CONTROL GROUP (N=20)			
	Mean	Mean	Mean Difference	S _{MD}	t*
Neutral Stimulus Words	1578	1305	†273	119.9	2.27
Critical Stimulus Words	1920	1510	†410	114.2	3.59

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level; t of 2.54 significant at 2 per cent level; t of 2.09 significant at 5 per cent level.

the neutral stimuli, the mean difference of 273 in favor of the experimental group is significant at the 5 per cent level. For the set of words related to the religious values, the mean difference of 410 in favor of the experimental group is significant at the 1 per cent level.

Thus, the data presented in Tables 10 and 11 suggest the conclusion that there is a positive relationship between the involvement essay and the magnitude of GSRs to stimulus words presented to the subject after

the reading of the essay. The data likewise suggest the conclusion that the specific effect of the essay is more closely related to the magnitude of GSRs to the critical items than to the magnitude of GSRs to the neutral stimulus words. The nature of this relationship and the specific effects of the involvement essay will be discussed in the following chapter.

It will be recalled that the design of this experiment included two independent variables and two hypotheses. Although the effects of the two variables cannot be easily separated (at least not for the second part of the experiment), for purposes of clarity it was necessary to present the data somewhat independently. Thus far, we have focused our attention on the role of the neutral essay -- involvement essay variable. We have concluded that the data supports the hypothesis related to this variable: subjects of high religious values who are experimentally involved in their religious values give significantly greater GSRs to stimulus words related to their values than subjects of high religious values who are not experimentally involved. It yet remains to assess the effect of the neutral stimulus word -- critical stimulus word variable.

To assess the effect of this variable it will be necessary to make a direct comparison of the magnitudes of GSRs to the neutral stimulus words with the magnitudes of GSRs to the critical stimulus words. Again this experimenter felt that the most adequate measure of difference would be total autonomic responsivity, the summations of GSRs to each set of stim-

ulus words within in each half of the experiment. Thus, a comparison can be made for each subject within each group between the subject's total autonomic responsivity to the neutral words and his total autonomic responsivity to the critical stimulus words. Because of the intervention of the neutral essay -- involvement essay variable, it will be necessary to treat the first half of the stimulus word list (first eight stimulus words) independently of the second half of the stimulus word list (second eight stimulus words).

Although the experimental and control groups were subject to the same experimental conditions during the first part of the experiment, for purposes of consistency the data for the two groups are presented independently. For the first part of the experiment, summations of the GSRs of each subject to the words STREET, CLOCK, SAND, BELL were compared to the summations of the GSRs of the same subject to the words FAITH, PRAYER, SPIRITUALITY, PRIEST. An analysis of the significance of the difference between these two sets of stimulus words was conducted. This data is presented in Table 12.

It will be seen that the differences between the means of GSRs to the neutral stimulus words and the means of GSRs to the stimulus words related to religious values in the first half of the stimulus list are significant at the 1 per cent level for both the experimental and control groups.

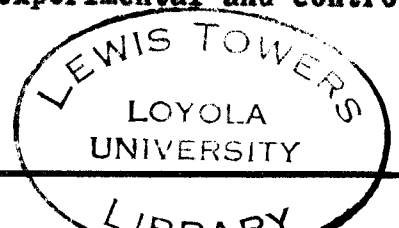


Table 12

A COMPARISON OF THE DIFFERENCES BETWEEN THE MEANS FOR TOTAL AUTONOMIC RESPONSIVITY OF THE NEUTRAL STIMULUS WORDS AND THE CRITICAL STIMULUS WORDS IN THE FIRST HALF OF THE STIMULUS LIST

	NEUTRAL STIMULUS WORDS	CRITICAL STIMULUS WORDS			
	Mean	Mean	Mean Difference	S _{MD}	t*
EXPERIMENTAL GROUP (N=20)	1800	2136	†336	90.4	3.72
CONTROL GROUP (N=20)	1826	2083	†257	51.8	4.96

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level.

The same procedure can be applied to the stimulus word list in the second half of the experiment, i.e. after the introduction of the neutral essay -- involvement essay variable. Although the two groups were subjected to different experimental conditions, it is still possible to assess the differences between the neutral and critical words under the two different experimental conditions. For this second part of the experiment, summations of the GSRs of each subject to the words GLASS, TREE, CHAIR, FLOWER can be compared to the summations of the GSRs of the same subject to the words WORSHIP, HOLINESS, RELIGION, GOD. Again, we have a comparison of the total autonomic responsivity to the set of neutral

words with the total autonomic responsivity to the set of critical stimulus words. This set of data is presented in Table 13.

Table 13

A COMPARISON OF THE DIFFERENCES BETWEEN THE MEANS FOR TOTAL AUTONOMIC RESPONSIVITY OF THE NEUTRAL STIMULUS WORDS AND THE CRITICAL STIMULUS WORDS IN THE SECOND HALF OF THE STIMULUS LIST

	NEUTRAL STIMULUS WORDS	CRITICAL STIMULUS WORDS			
	Mean	Mean	Mean Difference	S _{MD}	t*
EXPERIMENTAL GROUP (N=20)	1578	1920	+342	89.5	3.82
CONTROL GROUP (N=20)	1305	1510	+205	58.2	3.52

* With 19 degrees of freedom, t of 2.86 significant at 1 per cent level.

Again, it will be seen that the differences between the means of total autonomic responsivity to the neutral stimulus words and the means of total autonomic responsivity to the critical stimulus words are significant at the 1 per cent level for both the experimental and control groups. Thus, under the three different experimental conditions (before reading the essay, after reading the involvement essay, after reading the neutral

essay), stimulus words related to religious values evoked significantly greater GSR magnitudes (as represented by total autonomic responsivity) than did the neutral stimulus words. This analysis of the data suggests the conclusion that there is a positive relationship between subjects of high religious value strength and the magnitude of GSRs to stimulus words related to the values. Thus, the analysis of the data concerning the neutral word -- critical word variable supports the hypothesis related to this variable: subjects of high religious values give significantly greater GSRs to stimulus words related to the religious value than to neutral words. Quantitative analysis of the magnitude of the GSRs supports both of the hypotheses which the experiment was designed to test.

Qualitative Analysis

Analyses of certain qualitative factors such as blocks and verbal responses did not yield any significant results. Taking a delay of four seconds between the presentation of the stimulus word by the experimenter and the verbal response by the subject as indicative of a real block, 14 subjects in the experimental group had at least one block for the first half of the stimulus list; 15 subjects in the control group had at least one block for the first half of the stimulus list. 13 subjects in the experimental group had at least one block for the second half of the stimulus list; 11 subjects in the control group had at least one block for the second half of the stimulus list.

There were a total number of 31 blocks (11 on neutral words, 20 on

critical words) for the experimental group in the first half of the stimulus list; the control group evinced a total number of 25 blocks (6 on neutral words, 19 on critical words) in the first half of the stimulus list. Between the two groups, there were a total number of 18 blocks on the stimulus word SPIRITUALITY, a finding which can probably be attributed to the difficulty of the stimulus word.

In the second half of the stimulus list, there was a total number of 30 blocks (8 on neutral words, 22 on critical words) for the experimental group; the control group had a total number of 21 blocks (6 for neutral words and 15 for critical words) for the same stimulus list.

All told, the neutral words occasioned a total number of 31 blocks, whereas the critical words occasioned a total number of 76 blocks. This is perhaps a significant finding, but because of the conditions of the experiment the experimenter does not feel justified in drawing any conclusions from this fact. The experiment was not undertaken with any particular hypothesis concerning blocking in mind, and the finding is, at best, post factum. Table 14 presents a word-by-word analysis of the total number of blocks within each group.

A cursory analysis of the verbal responses did not yield any significant findings. Again, the experimenter did not undertake the experiment with any particular hypotheses concerning the verbal responses in mind. Nevertheless, for purposes of thoroughness, the verbal responses of each

subject for each stimulus word are catalogued in Appendix III.

Table 14

TOTAL NUMBER OF BLOCKS FOR EACH STIMULUS WORD

STIMULUS WORD	BLOCKS: EXPERIMENTAL GROUP	BLOCKS CONTROL GROUP
STREET	2	1
FAITH	2	0
CLOCK	2	0
PRAYER	3	4
SAND	3	1
SPIRITUALITY	7	11
BELL	4	4
PRIEST	8	4
GLASS	5	2
WORSHIP	3	0
TREE	1	0
HOLINESS	6	3
CHAIR	2	1
RELIGION	8	5
FLOWER	0	3
GOD	5	7

CHAPTER V

DISCUSSION AND SUMMARY

The hypotheses being tested in this experiment involved a two-fold prediction:

1) Subjects of high religious values will give significantly greater GSRs to stimulus words related to the religious value than to neutral stimulus words;

2) Subjects of high religious values who are experimentally involved in their religious values will give significantly greater GSRs to stimulus words related to their values than subjects of high religious values who are not experimentally involved.

It will be recalled that the first hypothesis was tested under three different experimental conditions: before reading the essay, after reading the involvement essay, after reading the neutral essay. Under each of the three different experimental conditions, the neutral word -- critical word variable produced differences significant at the 1 per cent level. Thus, it will be necessary to discuss the import of the type of stimulus word used.

The unique factor in this experiment, the involvement essay -- neu-

tral essay variable, was related to the second hypothesis. This variable also produced positive findings, and it will likewise be necessary to discuss the influence of the essays on autonomic responsivity.

Before undertaking a discussion of these variables, however, it would be well to concretize an ambiguity that may have arisen in the course of the presentation of this paper. The general framework in which the experimental investigation was introduced centered upon the problem of the validity of the value construct as a motivational factor in behavior and the specific nature of religious values. This investigator views this experiment in the light of this general problem.

Nevertheless, the design of this experiment does not permit of an extrapolation from the positive findings to a general consideration of the nature of religious values. Religious value was treated as a constant and not as a variable. It is quite possible that similar findings could have been obtained using subjects of relatively low religious value strength. Since such a control was not provided, no direct conclusions can be drawn concerning the nature of religious values.

Furthermore, it should be pointed out that it is inconsistent even to expect that the paper and pencil assessment of values (e.g., the Allport-Vernon-Lindzey Study of Values) should correlate positively with physiological indices of valuation. It may very well be that these two different approaches to the problem are dealing with distinct dimensions

of personality. Allport assumes that psychological values have physiological correlates, and this experimenter is inclined to agree with him. Experimental research has yet to establish any generally positive relationship between the value areas described by Allport and such factors as autonomic responsivity to stimulus words related to the values.

The point of this experiment is that autonomic responsivity to stimulus words is itself an indicator of valuation. It is the contention of this experimenter that GSRs to stimulus words constitute a type of independent evidence of valuation based on the meaningfulness of different types of stimulus words.

It was noted in an earlier chapter that a generally accepted conclusion in GSR research is that "emotional" stimulus words tend to evoke greater GSRs than do "non-emotional" words. I do not intend to run aground here on the meaning of emotion. The contention of Woodworth and Schlossberg, following Wechsler, is, I think, well taken: "We should stop thinking of Emotion with a capital E. . . . Instead, we should use emotion to describe the individual who is highly energized, active, tense, or activated" (1954, p. 159). The GSR is thus seen as a change in the level of activation, a preparation for a potential increase in gross activity.

When the experimenter is using cognitive stimuli such as stimulus words, the question arises as to why one stimulus word produces a greater

level of activation than does another stimulus word. When a set of stimulus words consistently produces larger GSR magnitudes than does another set, the experimenter is justified, I think, in assuming the existence of some sort of interrelationship between the stimulus words in that set which consistently produces a greater magnitude of response. Why does one type of stimulus word induce a greater level of activation than another type? It seems obvious to me that, if other important variables are controlled, the answer must lie in the fact that the type of stimulus word evoking the larger GSRs must be more meaningful to the subject than the other type of stimulus word. I would describe this type of meaningfulness as valuation.

In this experiment the stimulus words related to religious values consistently evoked larger GSRs than did the neutral stimulus words. In other words, the critical stimuli held a greater value for the subjects than did the neutral stimuli. In terms of this experiment, it might well be possible to infer a positive relationship between strength of religious values and magnitude of GSRs to stimulus words related to the values. Nonetheless, it should be pointed out that the only comparison available is between the religious stimulus words and the relatively innocuous set of neutral stimulus words. The only conclusion that this experimenter is tempted to draw is that the religious stimulus words were more meaningful to the subjects than were the neutral stimulus words.

An interesting possibility for further research would be to adminis-

ter a stimulus list containing sets of words related to all six of the major value areas described by Allport. It would then be possible to make direct correlations between strength of values and magnitude of GSRs to stimulus words related to the value areas. No such positive correlation concerning religious values can be inferred from this experiment.

We have yet to discuss the role of the involvement factor. We have seen that prior to the introduction of the involvement factor the experimental and control groups were roughly equivalent in their responses to the first eight stimulus words. After the introduction of the neutral essay -- involvement essay variable, significant differences were obtained for the neutral word CHAIR (2 per cent level), the religious words WORSHIP and GOD (5 per cent level), and the religious word RELIGION (1 per cent level).

A more important index, I think, is the assessment in terms of total autonomic responsivity to the respective sets of neutral and critical items. This investigator does not intend to discuss the respective merits of any particular stimulus word, since total autonomic responsivity seems to be a more accurate measure of the global response of the subject to the entire experimental situation. When total autonomic responsivity to each set of stimulus words is used as the criterion of differentiation between the experimental and control groups, the effect of the involvement factor is quite unambiguous (see Tables 9 and 11). Before the introduction of the involvement essay -- neutral essay variable, the experi-

mental and control groups are roughly equivalent in their responses to the respective sets of critical and neutral stimulus words. The involvement factor produced differences significant at the 5 per cent level for the neutral words and at the 1 per cent level for the religious stimulus words.

In the first half of the stimulus list, the mean GSR to each of the neutral stimulus words was 450 for the experimental group and 457 for the control group (a mean difference of 7 in favor of the control group). The mean GSR to each of the critical stimulus words was 534 for the experimental group and 521 for the control group (a mean difference of 13 in favor of the experimental group).

In the second half of the stimulus list, however, the mean GSR to each of the neutral stimulus words for the experimental group was 395 whereas the mean GSR to the same words for the control group was only 326 (a mean difference of 69 in favor of the experimental group). The mean GSR to each of the critical stimulus words was 480 for the control group and only 377 for the experimental group (a mean difference of 103 in favor of the experimental group).

Throughout the course of the experiment, then, several trends are evident. In the first place there is a gradual decrease in the magnitude of the GSRs as the subject proceeded from the beginning to the end of the stimulus list. This is a common finding in GSR research using stimulus

words lists and can be attributed to the gradual adaptation and relaxation of the subject. If no other factors are introduced, the subject adapts to the situation and usually becomes progressively less excitable.

In this experiment, it would seem that the neutral essay did relatively little to disturb subject adaptation. For the control group, the magnitude of the GSRs to the stimulus words in the second half of the list are considerably smaller than the GSRs to the stimulus words in the first half of the list. The control group continued to differ significantly in their responses to the neutral and critical stimulus words, but it would seem that the neutral essay had little effect on their responsiveness.

The essay on clerical involvement, however, produced a notable difference between the two groups. The essay was designed to act as a challenge to the religious beliefs of the subjects, and the disturbing content of the involvement essay can be viewed as a threat to the commitment of a clerical student.

I would interpret the results as an indication that the involvement essay served to inhibit subject adaptation. It should be noted, however, that the influence of the essay had a greater impact on the religious stimulus words than it did on the neutral stimulus words. In the second half of the stimulus list, the difference between the experimental and control groups for the neutral words was significant only at the 5 per

cent level, whereas for the critical words the difference was significant at the 1 per cent level. In short, the emotional impact of the involvement essay was not completely undifferentiated but seems to have been more closely related to the critical words than to the neutral items.

I would thus conclude from these findings that this experiment furnishes some justification for the validity of the religious value construct. In the first place, there is the brute fact that in subjects of high religious value stimulus words related to the value evoke greater GSRs than do unrelated stimulus words. It seems somewhat circular to describe these stimuli simply as "emotional." The more basic question seems to be why they are emotional. The fact that the critical stimulus words are more meaningful seems to me to be an indication of valuation.

Secondly, some reason must be assigned to the influence of the involvement essay. One cannot beg the question by simply describing the essay as an emotional threat. Again, the basic question seems to be why the involvement essay produced a greater level of activation than did the neutral essay. These questions would be answered by the postulation of a appropriate cognitive affective construct such as religious value.

Summary

The purpose of this experiment was to discover the relationship between subjects of high religious value and GSRs to stimulus words related to the value under varying conditions of involvement in the value. Val-

ues were assessed through the use of the Allport-Vernon-Lindzey Study of Values, and the general problem of the validity of the value construct was discussed. It was assumed that if the hypotheses in this experiment were supported, the experiment would furnish a type of independent evidence for the validity of the value construct.

It was found that stimulus words related to the value evoked significantly greater GSRs than did neutral stimulus words. It was further discovered that subjects who are experimentally involved through the use of an involvement essay showed greater autonomic activity than subjects that read a neutral essay. The two groups differed more significantly on their GSRs to stimulus words related to the value than to neutral stimulus words. The experimenter thus concludes that these results can be explained through the postulation of a religious value construct.

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APPENDIX I
INVOLVEMENT ESSAY

In an age when science and reason are attempting to establish their rightful places as the soundest guides to human action, it is particularly unnerving to the intelligent and educated man to find such wide-spread devotion to idiotic and superstitious cults like Christianity. Science long ago established the fact that belief in all-powerful supernatural beings is no more than a neurotic myth. The persistence of such myths is the single most destructive force in man's attempt to construct a healthy world. The Christian, instead of facing the difficulties and obligations of life in a rational manner, tries to escape his obligations by creating in his own mind omnipotent supernatural powers whom he faithfully serves. This is the coward's way out.

Clergymen are the most neurotic and cowardly of the Christian breed. Take, for example, the problem of celibacy. The role of the clergyman makes it patently impossible for him to live a life of celibacy and still be able to help the families he is supposed to serve. In addition to the fact that celibacy makes the clergyman inefficient in his work, it also leads to mental strain, maladjustments, and mental illness. If these bad effects are not present, there is little doubt that the clergyman is not living up to his ideal. He is living as a fraud, undoubtedly indulging his warped sexual fantasies in secret. The manly thing to do is to face one's responsibilities by taking on the obligation of family life.

Clergymen are simply too cowardly to face their family obligations, and therefore they promote Christian myths in order to earn an easy living.

Parasites!

Another example of their deviousness is clerical garb. The dark clerical garment with reversed collar actually repels individuals by its austere appearance instead of inspiring them with the notion of sacredness. Special costumes may well be tolerated in certain callings, such as police work and the armed forces, but these very insignia of office have the effect of putting a distance between the uniformed person and others, rather than enabling them to foster more amicable social relations. Thus, clergymen hide behind their uniform, using it as a protective device. It enables them to earn a living without meeting the obligations of social life.

Fortunately, Christianity and its morose practices have had their "day in the sun." In the rapidly-approaching post-Christian era where science is establishing itself as the supreme arbiter of human affairs, men live by their reason and not by fear and superstition. A new day is dawning, and in the society of the future there will be little room for the outmoded ideals and practices of the Christian neurosis.

APPENDIX II
NEUTRAL ESSAY

At a recent convention of automobile dealers and manufacturers representing the major automobile concerns in this area, considerable discussion focused upon the problem of automobile design. Since it was generally conceded that there is a decisive trend in American automobile design toward the construction of relatively simple, less expensive models, various aspects of this phenomenon were discussed.

One main topic of discussion was the overwhelming success in recent years of "compact" and smaller models. On the whole, it was felt that this trend was beneficial both to the automobile industry and the public. Smaller, less complex models have the advantage of lessening production costs in automobile construction. Thus, the production of less expensive automobiles opens up the possibility of catering to a larger market. In the long run, mass-producing less expensive but equally well-constructed cars increases the volume of sales, resulting in a proportionate increase in dealer and manufacturer earnings. Furthermore, there is a growing need among modern families to have a second car at their disposal. The compact car is an ideal solution to this problem. Thus, the dealers and manufacturers felt that the production of compact models was rendering a public service in satisfying a distinct need in contemporary society.

Another important feature in the construction of less complex models

was unanimously lauded by all the representatives attending. This feature was the ready accessibility in these models to the installation of various safety devices. All the automobile representatives felt that the installation of safety devices in the very construction of automobiles is a definite necessity. One of the most significant developments that emerged from the discussions was the adoption of a resolution to incorporate as standard equipment on all automobiles six safety features that are now optional on most models. In the future the following items will be installed as standard equipment on all automobiles: rear seat belts, padded dashboards, padded sun visors, backup lights, outside left-hand mirrors, and windshield washers hooked to electric wipers (which maintain a steady beat regardless of the speed of the car).

In the general estimation of the dealers and manufacturers, the next few years would not be a time of radical new departures in automobile production and design. Rather, the industry will renew its efforts to provide attractive but serviceable and well-constructed models to meet the needs of the public.

APPENDIX III
VERBAL RESPONSES

STIMULUS WORD	RESPONSE WORDS		CONTROL GROUP
	EXPERIMENTAL	GROUP	
STREET	car(s) 5* house 3 corner 2 blacktop pavement traffic trolley	boulevard avenue walk brown asphalt road	car(s) 8 corner 3 sign 2 pavement road Pishwacki Main lane avenue people
FAITH	hope 9 religion 4 church 2 Christ 2	charity think God	hope 12 religion 3 church 2 God
CLOCK	time 7 hands 3 hour 2 watch 2 face	horse alarm wall clock gold	time 10 tick 3 radio 2 hand window watch watcher Westclox
PRAYER	church 3 book 2 Christ 2 God 2 chapel 2 hope 2 religion	toward piety office holiness trust kneel	God 8 Our Father 2 hands Bible worship kneeling Christ sorry pray love meeting ask
SAND	beach 11 piper stone box sandbox	desert seashore fine sea pile	beach 11 shore 2 ocean sea plane paper water pile white

* The numbers to the right of a word indicate the total number of subjects who responded with that word.

STIMULUS
WORDRESPONSE WORDS
EXPERIMENTAL GROUP

CONTROL GROUP

STIMULUS WORD	EXPERIMENTAL GROUP	CONTROL GROUP		
SPIRITUALITY	Christ 4 God 3 magazine lay redemption Catholicism corporality Tanqueray Garrigou	soul theology Dominican Theresa prayer Lord	religion 3 nothing 3 prayer 2 God souls faith Dominican Holy Spirit Dom Marmion	Bouyer good religiosity religious-life mystical love

BELL	tower 9 bell 2 ring 2 gong 2 bell ringer	school steel get up clanger	tower 4 ring 3 ringer ringing clapper gong ding dong book	telephone me church toll office schedule exercise
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PRIEST	man 3 cassock church religion bishop sacraments acolyte altar mass	sacerdotal minister offer me priest faith collar crucifix Catholic	God 3 sister 2 church 2 woman pray monk preacher man	prayer religion man of God faith brother mass Fr. Ingling clergyman
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GLASS	window 6 water 5 drinking dishes jar drink	hour room clear house pane	window 7 taker teachers eye frame house safety	windshield pane milk washer cut tipper drinking
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STIMULUS WORD	RESPONSE WORDS			
	EXPERIMENTAL GROUP		CONTROL GROUP	
WORSHIP	God 6 church 3 faith 3 prayer 2 pray	stand chapel kneel liturgy priest	prayer 6 God 5 church 3 pray 2	service 2 devotion mass
TREE	green 3 leaves 3 flower(s) 2 bark woods apples sand grass	fall nature top tree bird house next	oak 3 leaf 3 leaves 2 green 2 elm 2 foliage bird	ground country tall grove evergreen root
HOLINESS	Christ 4 sanctity 2 God 2 man 2 piety charity spirituality	religious priestly saints eternal goodness truth hope	sanctity 7 saintliness 2 spirituality 2 union with God wholeness mystical salvation	Jesus prayer church God pope
CHAIR	table 7 sit 3 seat 3 sitting whole	posture body room wood shoe	sitter sit 8 sitting 2 seat 2 me 2	man stool table rocking arm
RELIGION	faith 3 church 3 God 2 Christ 2 Catholic Catholicism Christianity	holiness love religious hope belief worship theology	Catholic 5 faith 4 God 3 worship 2 prayer 2	home church religious way to God

STIMULUS WORD	RESPONSE WORDS			
	EXPERIMENTAL GROUP		CONTROL GROUP	
FLOWER	pot 3 tree 3 rose 2 bee color grow sun yellow	daisy garden petal bloom flower seed lily	rose 5 garden 2 pot 2 bud bee petal bushes	daisy pretty vase beautiful beauty bed arrangement
GOD	man 6 omnipotence good religion flower holiness great supreme being	invisible hope is almighty church God holy	man 6 heaven home I prayer someone duty creator	Christ pray love religion one worship father

APPROVAL SHEET

The thesis submitted by Bernard G. Suran, O.P.
has been read and approved by three members of the
Department of Psychology.

The final copies have been examined by the director
of the thesis and the signature which appears below
verifies the fact that any necessary changes have been
incorporated, and that the thesis is now given final approval
with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment
of the requirements for the Degree of Master of Arts.

June 6 '66
Date

V. V. Herr S. J.
Signature of Adviser