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OF DISSIMILAR EMOTIONAL INDUCEMENTS AND
COMMUNICATION SKILL LEVELS ON THE MEANINGS
GIVEN COMMUNICATED MESSAGES.

The Louisiana State University and Agricultural
and Mechanical College
Ph.D., 1974
Business Administration

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An Experimental Study to Determine the Effects of Dissimilar Emotional Inducements and Communication Skill Levels on the Meanings Given Communicated Messages

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The Department of Management

by

Charles Donald Porterfield
M.B.A., North Texas State University, 1968
August, 1974
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ABSTRACT

The purpose of the study was to determine experimentally what effects, if any, two key within-receiver characteristics would have on the meanings communicated messages had for the respondents. The within-receiver characteristics were the emotional states of mind and communication skill levels of the test subjects. The study hypothesized that:

1. The meanings given communicated messages by subjects receiving dissimilar emotional inducements would vary significantly.
2. The meanings given communicated messages by subjects with different communication skill levels would vary significantly.
3. There would be a significant interaction effect of the dissimilar emotional inducements and communication skill levels of the subjects on the meanings given communicated messages.

The study used a modified after-only with control group experimental design. The independent variables were the emotional inducements and communication skill levels of the subjects. The dependent variable was the meaning given five one-word concepts as measured by the Semantic Differential. The sample was made up of 221 undergraduate business students enrolled in ten different classes at nine different universities in Texas and Louisiana.

The research procedure consisted of two entries into each of the selected classrooms. At the first entry the investigator delivered a cover story, measured the students' communication skill levels, and established the expectation of a return visit. Prior to the second visit the classroom instructor gave a regularly scheduled exam. On the day of the investigator's
return visit the classroom instructor, at the beginning of the class period, implemented either a positive, negative, or neutral emotional inducement. These inducements were tied to the return of the exam. Near the end of this same class period the investigator entered and administered the Semantic Differential. Only afterwards were the students told they had participated in an experiment.

The subjects' communication skill levels were measured by a standardized test, the Employee Aptitude Survey—Test 1, Verbal Comprehension. The scores from this test formed the basis for ranking all subjects into a high, medium, or low communication skill level category. The subjects then received a positive, negative, or neutral emotional inducement. The "after" measurement was the meaning given five one-word concepts by subjects who were characterized by a high, low, or medium communication skill level and who had received a positive, negative, or neutral emotional inducement.

From the Semantic Differential the study derived twelve dependent variable measures. Five of these came from the evaluative scale designations of the five one-word concepts. Five others came from the potency scale designations of the same concepts. In addition, two composite scores were derived by averaging the evaluative (and potency) scale designations of all five concepts for each subject.

The principal analytical technique was the two-way analysis of variance. Each dependent variable measure was tested to see if differences in meaning between test groups were attributable to the types of emotional inducements, to the communication skill levels, or to an interaction effect between these factors. All statistical tests were operated at an alpha level of .05.
The study obtained statistically significant findings in five of the twelve tests run. There was a significant interaction effect with the concept Sword, using potency scale designations. There was one instance of significant difference in meaning attributable to different communication skill levels. This occurred with the evaluative scale designations for the concept Symphony. Statistically significant differences between groups attributable to dissimilar emotional inducements occurred with the evaluative composite score, the potency-Patriot score, the evaluative-Symphony score, and the evaluative-Cop score. The study concluded that, based on these findings, there was reason to believe that emotions affect the meanings given incoming stimuli.
AN EXPERIMENTAL STUDY TO DETERMINE THE EFFECTS OF DISSIMILAR EMOTIONAL INDUCEMENTS AND COMMUNICATION SKILL LEVELS ON THE MEANINGS GIVEN COMMUNICATED MESSAGES

I. AN ORIENTATION TO THE RESEARCH STUDY

A. A Background to the Study

A primary objective of modern research in human communication is to isolate those variables which influence the response of a receiver in a communication event.\(^1\) Typically, the research takes one of two directions. On the one hand, the research focuses on those variables that constitute inputs to the receiver or what Kelly calls stimulus characteristics.\(^2\) Here the researcher varies such factors as channel mode, message content, message context, or structure to see what receiver responses transpire. Or, the researcher may manipulate extraneous factors (noise) or tamper with source credibility to see if responses differ. Whatever the case, the stimulus characteristics are treated as independent variables and tested for their effects on the receiver's response.

Research of a different nature focuses not on stimulus characteristics but on those characteristics that are uniquely a part of the receiver at


the moment a message is received. Two assumptions emerge concerning these within-receiver characteristics. The first is that every person capable of responding to a communicated message has unique within-receiver characteristics that will influence the response he or she makes. The second is that these within-receiver characteristics are present in the receiver prior to the receipt of a message and act, in conjunction with stimulus characteristics, to form meaning in the mind of the receiver. Thus, meaning in the mind of the receiver is a function of stimulus characteristics and within-receiver characteristics.

Berlo identifies the instrumental within-receiver characteristics as communication skills, attitudes, knowledge level, and social-cultural system. Kelly expands the list to include expectations, motivation, sex, and learning of the receiver. In more general terms, Thayer states:

There is thus a "something," some set of operations within people, which serves simultaneously as the ultimate source of all their knowledge about themselves and their worlds, and as the basis of all their purposive behavior vis-a-vis themselves and their worlds.

In specific terms Thayer describes this within-receiver package as containing the individual's

... extremely complex and intricately organized multidimensional hierarchy of concepts, values, beliefs... all of his assumptions, orientations, beliefs, feelings, hypotheses, constructs, etc., about what the world in general or any situation in specific is like—at least those aspects of that world he has dealt with or expects to deal with (or could potentially deal with).

6. Ibid., p. 43.
From Thayer's point of view, the within-receiver characteristics embody all the individual is, has been, and expects to be.

From a similar behavioral perspective, Westley and MacLean comment on other within-receiver forces at work in the communicative setting. Stressing the adaptive and reciprocal aspects of interpersonal communication, these writers suggest that one's responses can ultimately be traced to one's needs or problems. That is, in one's sensory field there are many objects of orientation. Certain of these objects will be transmitted to the receiver in abstracted form but only after a process of selection from among all possible objects. Those objects actually selected are based in part on the needs and problems of the receiver. Thus, the individual's needs and problems emerge as another set of discriminating within-receiver characteristics.

Within-receiver characteristics are not limited to purely mentalistic or psychological elements. Mortensen, for example, cites the role of physiological within-receiver characteristics. Mortensen models the human being's physical communication apparatus by tracing the act of information processing through four stages of activity in the nervous system. First, there is the acquisition of sensory data. Next comes the activity

---


9. Acquisition of sensory data takes place only when the stimuli are sufficiently intense to pass beyond one's arousal threshold and when they are not so complex as to overload one's sensory channels. In addition, one's stimulus analyzing mechanisms must be able to cope with the shape, form, color, texture, etc., of incoming stimuli.
of the central processing units, the spinal cord and the brain. Information storage, the complex sorting, arranging, and monitoring operations of the higher regions of the brain, comes next. Finally, there is the recall stage, a complex and not well-understood phenomenon bridging a multitude of theories the underpinnings of which are information decay, disuse, and interference. Clearly, differences in sensory apparatus might well affect the meanings given sensory stimuli. As such, the realm of physiological characteristics rightfully belongs in a discussion of prominent within-receiver characteristics.

Even a brief review of the literature discloses that the bulk of research on human communication stresses stimulus characteristics and, with the exception of physiological aspects of communication, generally ignores the psychological within-receiver characteristics. Most writings on the latter subject are, in fact, merely theoretical speculations perhaps based on personal experience or introspection, but lacking empirical support or testing. That such a void in the literature exists is distressing. If a receiver's response in a communication event is genuinely a function of both stimulus characteristics and within-receiver characteristics, then the latter merit scientific investigation.

10. By central processing units Mortensen means the cerebral cortex, the largest area of the brain that transfers electrical impulses from the sense organs to the appropriate processing units housed within its boundaries.

11. These terms—decay, disuse, and interference—merely constitute a taxonomy into which, according to Mortensen, most theories of recall may be subdivided.
B. The Nature and Purpose of the Study

The purpose of this study is to determine experimentally what effects, if any, two key within-receiver characteristics have on the meanings respondents give to communicated messages. The within-receiver characteristics are emotion and communication skill.

Modern communication theory suggests that the meaning given a communicated message by a receiver is, in part, a function of certain within-receiver characteristics present at the moment the message is received. This study is designed to ascertain whether emotion or communication skill, or both, are significant within-receiver characteristics.

1. Emotion as a Within-Receiver Characteristic

In the theory portion of his text, Lesikar speaks in some detail about the within-receiver characteristic of emotion. He says:

From the foregoing discussion it should be apparent that the emotions triggered play a part in determining the meanings we give to the perceptions we receive. The emotional energy brought about becomes a part of the filtering process. Thus it plays a role in determining the meanings given to perceptions which follow. In other words, the emotional state of the mind at the moment a perception is received helps to determine the meaning the mind gives the perception.12

This statement asserts that emotion present in the mind at the moment a perception is received will affect the meaning given that perception.

While such a belief may be supported by common experience, it lacks experimental validation. Furthermore, it leaves several questions unanswered.

Does emotion in fact play a part in communication by affecting the meanings given perceptions? In commenting on how and why humans communicate, Thayer says, "The way one is psychologically (conceptually) organized determines how he communicates with his world and how his world can communicate with him." To the extent that emotion can be regarded as a psychological phenomenon, it would seem to be a relevant within-receiver characteristic. People do get emotionally aroused. They frequently exhibit behavior which observers, perhaps by convention, label fear or anger or joy or excitement. And such behavior seems to have a modifying effect on subsequent behavior perhaps because of the interplay between the emotional state of mind at the moment and the meanings given subsequent perceptions.

If one accepts the assertion that emotion affects the meaning given perceptions, then other questions are in order. Do emotions differ in their capacity to influence meaning? Or, to state the matter somewhat differently, will different emotional states of mind produce different interpretations of the same perception? If emotions are affective agents, if emotions are unique and possess a distinct character (and from a purely descriptive point of view this is true), then is it not reasonable to ask if dissimilar emotions differ in their influence on meaning? Similarly, will the influence of some emotions be greater than that of others? The foregoing theoretical assertion provides little in the way of an answer.

A final question is whether emotion operates alone in influencing meaning or in conjunction with other within-receiver characteristics. Intuitively, the latter alternative seems the more reasonable. Thus,

this study seeks to find the relationship, if any, between emotion and communication skill as they jointly affect the meaning given perceptions.

2. Communication Skill as a Within-Receiver Characteristic

The study treats communication skill as an independent variable for several reasons even though its importance in human communication is perhaps unquestioned. For one thing, it is one within-receiver characteristic that is easily measured by existing standardized communication tests. Such measurability has the advantage of permitting the study to deal with more homogeneous experimental groups.

Including communication skill as a second independent variable gives the study greater sophistication. By differentiating the test subjects by communication skill level, the study can simultaneously test for the effects of different emotional arousals across subjects of differing abilities. It is conceivable that as communication skills increase, the incidence of variation in meaning due to the emotional arousal will decrease. That is, subjects with high communication skills may demonstrate less emotional influence in their interpretations of communicated messages than similarly induced subjects with low communication skills. Or, the opposite may be true.

Whatever the case, it seems reasonable to assume that the meanings given communicated messages are not the function of any single within-receiver characteristic, but emerge the product of the joint activity

14. Communication skill, as an independent variable, can mean many things, ranging from one's knowledge of the form and syntax of a given language to one's skill in handling communicative acts requiring tact or diplomacy. For purposes of this study communication skill refers to one's comprehension of the vocabulary of the English language.
of several within-receiver characteristics. This study examines two within-receiver characteristics, emotion and communication skill, with the aim of learning something about the role these variables perform in the communication process.

3. Meaning as the Dependent Variable of the Study

The dependent variable in this study is the meaning subjects give to communicated messages. The study, however, makes no attempt to ascertain the precise meanings communicated messages have for the test subjects. While such a goal may be desirable from the standpoint of achieving perfect validity, it is probably not attainable. Nor is it consistent with the underlying assumptions that have guided the design of this study. Meaning, ultimately, resides in the mind of the individual. And transforming that meaning into a symbol form for purposes of communicating involves an abstraction process which results in the inevitable loss of certain elements of meaning formerly in the mind.\textsuperscript{15} Furthermore, the symbolic code, which acts as a message vessel, is inexact and merely representational. Meaning is ascribed to the symbol code rather than derived from it.

For these reasons, the study does not seek to measure precise meanings. Rather, the study explores differences in meaning to the extent that these differences reveal themselves in and can be measured by an accepted research instrument, the Semantic Differential.

In summary, the study seeks answers to the following questions.

1. Will the meanings given identical messages vary because of differences in the emotional states of the test subjects?

2. Will the meanings given identical messages vary because of differences in the communication skills of the test subjects?

3. Will the meanings given identical messages vary because the emotional states and communication skills of the test subjects interact?

Although the study treats both emotional state and communication skill as independent variables, only the former is manipulated. The latter, obviously, is a pre-existing characteristic of each test subject, amenable to measurement, but not subject to manipulation for experimental purposes.

The study does attempt to manipulate the emotional states of the test subjects. But in so doing it makes no attempt to identify or induce a specific emotion. Rather, the study uses two emotional inducements which are exactly opposite in character. One inducement is designed to heighten emotions by positive means. The other inducement is designed to heighten emotions by negative means. As there is no known means of determining the actual emotion induced by either approach, the study assumes that a positive inducement will produce emotions akin to pleasure, elation, or joy, while a negative inducement will produce emotions akin to anger, rage, or resentment.
Thus, this study explores two within-receiver characteristics, emotion and communication skill. More specifically, it seeks to learn if the meanings given communicated messages are a function of these variables. That such research needs to be done is obvious from the paucity of similar studies to be found in the literature. Indeed, it is the literature itself that spawns the most urgent plea for this very study.

Emotions are part of the meaning given to perceptions of reality. As such they inevitably become part of the filtering phase of the communication process. More research is needed on the effect that emotions have on the internalization of meaning and the consequent effect of them in the communication process.16

C. Hypotheses to be Tested in the Study

The foregoing comments set the stage for the hypotheses to be tested in this study. In general terms, the study seeks to learn whether the meanings given communicated messages by experimental subjects will vary between:

1. subjects emotionally aroused and not aroused.
2. subjects aroused by positive or negative inducements.
3. subjects differing in communication skill levels.

To this end, the study derives the following matrix:

<table>
<thead>
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<th>Level of Communication Skill</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
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<td>Type of Inducement</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
<tr>
<td>Positive low group</td>
<td>Positive medium group</td>
<td>Positive medium group</td>
<td>Positive medium group</td>
</tr>
<tr>
<td>Neutral low group</td>
<td>Neutral medium group</td>
<td>Neutral medium group</td>
<td>Neutral medium group</td>
</tr>
<tr>
<td>Positive medium group</td>
<td>Positive high group</td>
<td>Positive high group</td>
<td>Positive high group</td>
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As indicated by the matrix, the study places the experimental subjects in high, medium, or low categories of communication skill. This placement represents the subjects' communication skill level as determined by a standardized verbal comprehension test. In turn, the subjects are subjected to positive or negative emotional inducements (the neutral group receives no inducement but is included in the study as a control group in order to provide a basis of comparison). Thus each cell of the matrix represents a distinct collection of subjects characterized by one of the communication skill levels and one of the types of emotional inducement. And each cell contains the Semantic Differential scores of its respective test subjects.

The data, grouped according to the matrix, are analyzed using a two-way analysis of variance. This form of analysis permits simultaneous testing for the significance of either main effect as well as for the significance of interaction. The analysis determines whether the meanings given
communicated messages by groups receiving dissimilar emotional inducements vary significantly. Likewise, the analysis determines whether the meanings given communicated messages by groups with differing communication skills vary significantly. Finally, the analysis determines whether there is significant interaction between the communication skill levels and the types of emotional inducement. If the latter is significant, then it would appear that emotion and communication skill act in concert to influence the meanings given communicated messages.

In keeping with the limits and capabilities of the proposed form of analysis, the study advances the following substantive and null hypotheses.

1. **Hypotheses Related to the Type of Inducement**

   The hypotheses presented below are grouped according to the three communication skill level groups.

   a. **Low communication skill group**

      In the low communication skill category the meanings given communicated messages by subjects in the positive, neutral, and negative groups will vary significantly.

      Null hypothesis: There will be no significant variation in meaning between positive, neutral, and negative groups in the low communication skill category.

   b. **Medium communication skill group**

      In the medium communication skill category the meanings given communicated messages by subjects in the positive, neutral, and negative groups will vary significantly.

      Null hypothesis: There will be no significant variation in meaning between positive, neutral, and negative groups in the medium communication skill category.
c. **High communication skill group**

In the high communication skill category the meanings given communicated messages by subjects in the positive, neutral, and negative groups will vary significantly.

Null hypothesis: There will be no significant variation in meaning between positive, neutral, and negative groups in the high communication skill category.

It should be apparent that the foregoing hypotheses are limited to the central question of whether different emotional inducements will produce differences in meaning. The hypotheses suggest that any differences in the dependent variable (meaning as measured by the Semantic Differential) are attributable exclusively to the type of emotional inducement and are unaffected by the communication skill levels of the test subjects.

It is equally plausible, however, that differences in meaning arise solely from the second main effect, levels of communication skill. That is, measured differences in meaning may be attributable exclusively to differences in the communication skill levels and remain unaffected by the types of emotional inducement. Since this outcome is plausible, a second set of hypotheses is warranted.

2. **Hypotheses Related to Communication Skill Levels**

The hypotheses presented below are grouped according to the types of emotional inducement used in the study.

a. **Negatively induced subjects**

In the negatively induced category the meanings given communicated messages by subjects in the low, medium, and high communication skill groups will vary significantly.
Null hypothesis: There will be no significant variation in meaning between low, medium, and high communication skill types in the negatively induced category.

b. **Neutrally induced subjects**

In the neutrally induced category the meanings given communicated messages by subjects in the low, medium, and high communication skill groups will vary significantly.

Null hypothesis: There will be no significant variation in meaning between low, medium, and high communication skill types in the neutrally induced category.

c. **Positively induced subjects**

In the positively induced category the meanings given communicated messages by subjects in the low, medium, and high communication skill groups will vary significantly.

Null hypothesis: There will be no significant variation in meaning between low, medium, and high communication skill types in the positively induced category.

The foregoing hypotheses suggest that either main effect can have a bearing on the dependent variable or that both may do so. The two-way analysis of variance shows whether variation in meaning is a function of the emotional inducements or the communication skill levels, or both.

3. **The Possibility of Significant Interaction**

The two-way analysis of variance also determines the statistical significance of a third possible outcome. As noted earlier, the data may indicate an interaction effect. For example, it may be that as communication skills increase across test subjects the incidence of variation in
meaning due to the emotional inducements will decline in those same test subjects. In other words, while low communication skill types may demonstrate marked differences in meaning if positively or negatively induced, similarly induced high communication skill types may demonstrate no differences in meaning. If such an outcome is forthcoming in the study, then an interaction effect is suggested because an independent variable (type of inducement) operates one way at one communication skill level and in a different way at another communication skill level.

D. Selected Citations from the Literature in the Field

Because of the protracted and oftentimes controversial history of the study of emotion, a review of selected references of the literature is in order. Such a review, drawing on those citations pertinent to the present study, provides a foundation for and justification of the present study. The following discussion is divided into two subsections, one describing theories of emotion, the other experimental research in emotion.

1. Theories of Emotion

There seems to be general agreement among psychologists that emotions exist and occupy a central place in human behavior. As Strecker and Appel state, "Emotions and feelings supply the energy which makes the mind work. Without emotion (emotional energy) man, although he could live, would be inert, existing in a vegetative state, not necessarily asleep or unconscious but immobile, almost as in a stupor."17 Thus, the human mind

without emotional energy remains incapable of performing its normal functions. In a similar vein, Bugelski states, "There is no time in our lives when we are free of emotional influences. There is no real zero point on a continuum from some sort of emotional vacuum to some high point, nor is there any neutral point at which various kinds of 'emotions' cancel out each other."  

Adding a final word, Vernon states:

However uncertain people may be as to the exact nature of their motives, they are seldom in doubt as to whether they are experiencing emotion; and usually they know well enough what emotion it is. Therefore, to abandon the concept of emotion would be to set aside a large area of normal experience which is as worthy of consideration as any other human experience.

While there is wide agreement among psychologists that emotions exist, there is sharp disagreement about the way emotions function. The traditional view holds that emotions are motivating variables. Thus one interprets a situation, certain emotions (fear, anger, joy, etc.) impinge on the interpretation, and certain behavior is forthcoming directed in part by the impinging emotions.

The most serious challenge to this view comes from James and Lange. These writers hold that emotions do not affect behavior but are merely accompaniments to behavior. Emotion, according to their theories, is merely the awareness of visceral or bodily changes that follow responses to traumatic stimuli. For example, a near mishap when driving an automobile does not first lead to fear and then to a violent tug at the wheel.

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to avoid a collision. Rather, one detects the situation, reacts with a
tug at the wheel, and only afterwards becomes aware of a certain short-
ness of breath, a trembling of the hands, or an increased palpitation of
the heart. It is the awareness of these aftereffects that James and Lange
call emotion.

Other psychologists have postulated that emotions are motivating vari-
ables. Here the view is that all perceptions of objects or situations
are accompanied by appraisals of their attractive, beneficial, repulsive,
or harmful aspects. Presumably, the appraisal leads to the tendency to
feel a specific emotion and the emotion provides the impetus to perform
certain behavior. Thus, anger may lead to aggression. Fear may lead to
flight. Or, the emotion triggered may lead to no action. Joy may lead
to the desire to prolong the existing state of affairs. Grief may lead
to the abandonment of hope of improvement.

Other writers suggest that emotions arise when goal directed behavior
is thwarted or frustrated. If one seeks to escape from a dangerous sit-
uation, little fear may be felt if escape is effected. But if escape is
thwarted the fear may become intense. Closely related to this view is
Meyer's theory that emotional intensity is directly related to a perceived
change in the satisfaction or dissatisfaction expected of an event or ob-
ject. If one expects a situation to be agreeable and it is not, one

1961) or D. Bindra, Motivation: A Systematic Reinterpretation (New York:

1 (1894), pp. 553-569.

p. 105.
experiences disappointment or resentfulness. Joy or elation may follow the situation one expects to be very difficult, if in fact things go well in the situation instead. And, depending on the sharpness of contrast between expectation and subsequent realization, emotional intensity will rise or fall.

Other theorists, accepting the proposition that emotions affect behavior, have suggested that emotions have a disruptive or disorganizing effect on behavior. Young, for example, suggests that the more violent forms of unpleasant emotion may render behavior maladaptive.\textsuperscript{24} Easterbrook suggests that even mild emotions may lead to maladaptive behavior since these emotions produce a funnelled attention to some central event while peripheral aspects or cues are ignored.\textsuperscript{25}

The foregoing comments, while admittedly brief, suggest that scholars have developed numerous theories explaining the origin, nature, and function of emotions.\textsuperscript{26} Furthermore, the theories reveal a consistent belief: the belief that emotions are instrumental behavioral variables whose effect on behavior though varying in intensity, duration, or direction, is nonetheless real.

\textsuperscript{24} P. T. Young, \textit{Motivation and Emotion} (New York: Wiley and Sons, Inc., 1961).


\textsuperscript{26} The most comprehensive review of theories of emotion currently available is James Hillman, \textit{Emotion: A Comprehensive Phenomenology of Theories and Their Meanings for Therapy} (London: Routledge and Kegan Paul, 1960). A work of immense magnitude, this text surveys the contributions of both American and European scholars who have explored the dimensions of emotion and emotional behavior. Hillman organizes these contributions under such headings as "Emotion as a Distinct Entity," "Emotion as Energy," "Emotion and Physiological Location," "Emotion and Situation," etc.
2. Experimental Investigations of Emotion

The literature reveals some experimental studies of emotion that are at least indirectly related to the present study. The relationship is only tangential, however, for no studies have explored specifically the effect of emotion on the meanings respondents give to communicated messages.

Davitz's research, for example, treats the communication of emotional meaning. Davitz suggests that emotions are communicated by oral and facial cues, that people differ in their sensitivities to these cues, and that sensitivity to emotional communication increases with both mental and chronological age. If persons identify and respond to the emotions of others, then it seems reasonable to assume they would be similarly affected by emotions within themselves. Unfortunately, Davitz has little to say about the influence of one's own emotions.

27. This discussion of experimental investigations of emotion is limited to those studies classified as behavioral or psychological. Not discussed is the vast bulk of literature pertaining to experimental research in the physiological aspects of emotion. Studies of this sort operate on the implicit assumption that there is a direct correspondence between psychological and physiological processes within the human organism. Thus, the research explores either peripheral aspects of emotional arousal (rises in diastolic blood pressure, changes in galvanic skin responses, increases in respiration rate, etc.) or it explores the functioning of various regions of the brain or central nervous system. Physiological aspects of emotion are treated at length in (1) W. D. Cannon, Bodily Changes in Pain, Hunger, Fear and Rage (New York: D. Appleton and Company, 1929); (2) A. Ax, "The Physiological Differentiation of Fear and Anger in Humans," Psychosomatic Medicine, Vol. 15 (1953), pp. 433-442; and (3) J. W. Papez, "A Proposed Mechanism of Emotion," Archives of Neurology and Psychiatry, Vol. 38 (1937), pp. 725-743.

Janis, in his studies of the effects of fear, sets forth several propositions having implications for the present study. In exploring the effect of fear on attitude change, Janis maintains that mild arousal can stimulate a change in attitude. If the arousal is more extreme, however, it can lead to a mobilization of resistances to attitude change. Finally, if the arousal is intense it may lead to an involuntary constriction of cognitive processes. Attention, comprehension, and learning are interfered with to the extent that attitude change cannot occur. Clearly, Janis’s work suggests that the behavior of the emotionally aroused subject is a function of the intensity of the arousal and that even mild arousal will affect behavior. Unfortunately, Janis limits his study to the arousal of fear and ignores alternative, positive forms of arousal.

In a similar study, but one using a hostility inducement, Latané and Arrowood find that emotional arousal has little effect on the performance of repetitive, previously mastered tasks. But when there is a changeover in tasks requiring the test subjects to learn new skills, performance among those emotionally aroused is considerably below those not emotionally aroused. Emotion, apparently, can affect learning and performance perhaps because it interferes with the mental processes ascribing meaning to incoming stimuli.


Ryerson, in an article arranging doctoral dissertations into twenty-three categories related to business communication, cites three dissertations which presumably treat "Perception as Affected by Emotional State of Perceiver." In actuality, none of the dissertations treats the emotional state of the perceiver and the consequences of that state on his perceptions. Hornstein's study, for example, suggests that one's skill in interpreting the emotional communication of another person is related to the degree of interpersonal compatibility achieved with that person. Here the emphasis is on the consequence of adapting to the emotional state of another person rather than the consequence of one's own emotional state.

Ryerson also cites a study by McCarthy where the latter explores the effect of emotionally loaded stimuli on visual recognition thresholds. Here, however, emotion is treated as a stimulus characteristic rather than as a within-receiver characteristic. Thus, the study is only indirectly related to the present inquiry.

The same is true of the third study cited by Ryerson, a doctoral dissertation by Radelfinger examining the effects of fear-arousing communications on preventative health behavior. As in the present study,


Radelfinger treats emotion as an independent variable. But his study explores the effects of emotionally loaded messages on "something," rather than the effects of emotional states on the interpretation of the messages themselves. The latter consideration is the thrust of the present study.

3. A Reflective Comment on the Literature Review

From the foregoing discussion of theories of emotion and experimental research in emotion the study draws the following generalizations which function as an undergirding for the present inquiry.

There is a consensus among scholars that emotion is, despite its inherent ambiguity, a relevant behavioral variable worthy of further investigation.

Emotion plays a role in all conscious human behavior whether it functions in a motivational capacity between stimulus and subsequent response, or whether it functions merely as an accompaniment to that response.

Emotion is inextricably bound to the situation whether it has its origin in the evaluation of incoming stimuli or whether it arises as a function of the disparity between expectation and realization associated with the situation.

While emotion may vary in intensity and is amenable to various forms of inducement, it can be induced and has been shown to influence the behavior of test subjects so induced.

The bulk of research linking emotion with communication has treated the former as a stimulus characteristic and has not explored the effect on the communication process of emotion as a within-receiver characteristic.
Thus, the present study seeks to determine whether the emotional state of mind of the receiver at the moment a message is received has any effect on the meaning given that message.

E. Limitations to the Study

There are several limitations inherent in the present study. The first of these is the lack of generalizability of the results since the test subjects are undergraduate students drawn from nine universities in Texas and Louisiana. The study is, however, exploratory in nature and may at least be indicative of results obtainable from other segments of the population.

A second limitation is the inability of the study to completely control for the effects of other within-receiver characteristics. Judicious sampling can partially solve this problem as the test subjects are reasonably homogeneous with respect to age, education level, nationality, and native tongue. Using samples of adequate size and manipulating mean scores across groups should partially offset extremes in within-receiver characteristics like expectation, motivation, attitude, or knowledge level.

A third limitation of the study is the difficulty in preventing the introduction of random stimulus characteristics. The severity of this problem can be reduced, however, by rigid adherence to the experimental

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35. Experimental research is plagued with hazards at every step of both design and execution. A full account of both anticipated and actual research problems in design, control, definition, measurement, sampling, etc., is presented in Section II, Methodology of the Study, pp. 26-67.
design. All subjects use the same test instruments, receive the same instruction, and are given the same time periods. All testing is conducted in classroom situations in conjunction with normal classroom routine. Of course, the classroom settings themselves vary as do the class instructors whose aid is enlisted in the study. While the latter may introduce some experimenter bias, the effect of this is partially offset by the fact that nine instructors are used and the data obtained from any one class are distributed across several test groups.

Another limitation hinges on the emotional inducements used. As already stated, the study makes no attempt to identify the specific emotion induced in the test subjects. Likewise, the study makes no attempt to measure the level of emotional arousal. Furthermore, there is no way for the study to determine whether the inducements produce identical increments of emotional arousal. In other words, there is no way for the study to determine whether one unit (figuratively speaking) of positive inducement yields the same increment in emotional arousal as one unit of negative inducement. While such refinements would greatly enhance the validity of the results by providing much greater control, such refinements are unavailable at this writing.

A final limitation of the study stems from its exploratory nature. Since there is no precedent for the study, the results cannot be compared to past studies for corroboration. However, it is likely that the study will give rise to additional hypotheses which, over time, can be tested and compared with this study so that the net effect is a small step toward understanding the complexities of a human communication event.
F. A Preview of the Remainder of the Study

This study is written in the indirect order. The following major sections of the paper treat the research methodology, the findings of the study, and the implications of the study.

Section II presents a full account of the research methodology of the study. Here the study discusses the research sequence, the sampling methods, the data instruments, the method of analysis, and the particulars of the statistical techniques. Throughout the discussion the study draws on the expertise available from a variety of sources to explain and support the decisions underlying each phase and aspect of the research design.

Section III presents the findings of the study. Each hypothesis is examined in detail in terms of the evidence that supports or refutes it. Any special observations or noticeable trends concerning the data emerge in this portion of the study. The study makes full use of a variety of graphic aids, and, if necessary, uses graphic analysis to plot any interaction effects discovered in the data.

Section IV presents the conclusions and implications of the study. More importantly, the study at this point will attempt to set forth additional hypotheses that may be deduced from the results.
II. METHODOLOGY OF THE STUDY

This portion of the paper treats the methodology of the study. Unfolding in the following subsections is a detailed account of (1) the research design, (2) the data collection, (3) the instrumentation, and (4) the methods of analysis.

The paper discusses first the research design in terms of its character, phasing, and basis of selection. The main thrust of this portion of the text is to explain what the study does and why it does it that way.

The data collection section is next and explains how, when, where, and from whom the data are acquired. The emphasis here is on the source of data, rather than the instruments used to elicit and record the experimental data.

Instrumentation is the subject of the next section. Here the text presents a detailed discussion of the two test instruments used for measurement as well as an explanation of the mechanism used to manipulate the independent variable.

The final subsection discusses the methods of analysis used in the study. At this point the text explains the use and appropriateness of the statistical techniques selected for the study.

A. The Research Design: Its Character, Phasing, and Basis of Selection

Every experimental research design can be characterized with respect to its assumptions, structure, and control features. In addition, every experimental design implies a set of steps, or a sequence or phasing,
that articulates the order in which the research is carried out. Finally, every experimental design has some basis of selection, some criteria by which it is selected from alternate designs, which reflects the investigator's awareness of threats to internal and external validity.

1. *After-Only With Control Group as the Experimental Design*

This study used a modified after-only with control group design for testing the aforementioned hypotheses. Basically, the design was structured as follows:37

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Before&quot; measurement</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Experimental variable</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>&quot;After&quot; measurement</td>
<td>YES (X₁)</td>
<td>YES (Y₁)</td>
</tr>
</tbody>
</table>

Effect of experimental variable = X₁ - Y₁

The arrangement above implies (1) the random assignment of test subjects to the experimental and control groups, (2) the manipulation of the independent variable in the experimental group only, (3) an "after" measurement in both groups, and (4) a comparison of "after" measurements to disclose any differences between groups. Any difference between the "after" measurements is presumed to be caused by the manipulation of the independent variable.

The present study followed the above scheme, but with certain modifications. There were, for example, two experimental groups. One received the positive emotional inducement, the other the negative emotional

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inducement. The control group received the neutral inducement. The sub-
jects were assigned on a random basis to the respective groups and were
then subjected to the inducements. The emotional inducements constituted
the effort to manipulate the independent variable. The "after" measure-
ment was the Semantic Differential which the study used to measure the
meanings given communicated messages by the subjects in different groups.

2. Phasing of the Steps in the Research Design

The research model described above sets the stage for articulating
the phasing of the research. Upon gaining permission to conduct research
in the schools selected for the study, the investigator initiated the
following sequence of events.

Phase I. The investigator arranged a meeting with the classroom in-
structor, whose aid was enlisted in the study. The investigator arranged
to enter the instructor's classroom once before the date of a regularly
scheduled exam and once afterwards.

Phase II. The investigator entered the instructor's classroom on a
prearranged date prior to the date of a regularly scheduled exam. The
investigator explained his purpose for being there. The students were
asked to do the following:

1. To volunteer for the first part of a two-part survey.
2. To identify themselves by student number only.
3. To fill out a short questionnaire that accompanied the first test.

The investigator then gave the first test (a standardized verbal com-pre-
hension test) and announced that he would return in a few days with the
second survey. The investigator then left the classroom.
Phase III. The classroom instructor gave his students a regularly scheduled exam.

Phase IV. The instructor entered the classroom on the appointed day after the date of his regularly scheduled exam. He carried the exams under his arm as if they were ready to be returned. He announced to the class that he would give the exam results, continue with his lecture, and distribute the exams at the end of the class period. The instructor then proceeded to announce the exam results and at this point he did one of three things.

1. Introduced the negative inducement
2. Introduced the neutral inducement
3. Introduced the positive inducement

Following the implementation of the inducement, the instructor commenced his lecture. He did not hand back the exams.

Phase V. Toward the end of the same class meeting the investigator entered the classroom and administered the Semantic Differential. The students were told that this was the second "survey" instrument promised during Phase II. When the students finished the test, the investigator made a full disclosure of what had actually occurred.

At the outset it might appear that the phasing described above implies a pre-test, post-test design since a test was given in Phase II. But the test given in Phase II was a verbal comprehension test the results of which were used to categorize the subjects into low, medium, and high communication skill groups.
The main function of Phase II was to implement the cover story, which accomplished three things. First, it gave an explanation as to why the investigator was there in the first place. Second, the cover story drew attention away from the experimental nature of the study. Third, and most important, it enabled the investigator to establish the expectation of a return visit. When the investigator returned in Phase V the students were already expecting him, were familiar with his purpose, and, presumably, were not likely to make a connection between his appearance and the activities of their instructor at the beginning of the class period.

The purpose of Phase III was to give the instructor an opportunity to conduct a regularly scheduled exam. The students, of course, were not told that the investigator's visits were scheduled to occur before and after this exam.

Phase IV was the most crucial phase of the research undertaking. In this phase the classroom instructor implemented the emotional inducement. So that there would be a reasonable degree of uniformity in the execution of this phase, the investigator provided each instructor with a script containing exact instructions regarding timing, announcements to be made, and sequence.

Phase V involved the "after" measurement. Near the end of the class period the investigator entered the classroom and administered the Semantic Differential. The resulting scores constituted a measure of the meanings of communicated messages to subjects who had received a certain kind of emotional inducement and who were characterized by a certain communication skill level.
3. Basis of Selection of Experimental Design

As Webb and Campbell point out, deciding upon an appropriate experimental design is a matter of weighing threats to internal and external validity. The threat to internal validity hinges on the "extent to which an observed difference within the limited frame of an experiment can reasonably be attributed to an experimental treatment." Obviously, internal validity must be the "basic minimum without which any experiment is uninterpretable." The threat to external validity hinges on the "truth value of a hypothesis and its generalization to a larger world of different people or different settings."

For the researcher this poses a dilemma. To strive for both internal and external validity implies certain trade-off decisions because the factors strengthening one kind of validity are frequently in conflict with the factors strengthening the other kind of validity. The present study does not escape this dilemma. In the following paragraphs the study examines these threats to validity in juxtaposition to the aforementioned research design. What emerges is the rationale for the adoption of the research design used in the study.

Webb and Campbell cite eight threats to internal validity. The first of these is the threat of instability or chance. An experimental


39. Ibid., p. 939.

40. Ibid.

41. Ibid.

42. Ibid., pp. 940-941.
undertaking is structured so as to "provide a measure of the degree to
which one can accept the plausibility of the hypothesis that chance alone
produces a difference."\textsuperscript{43} Thus, a given study that achieves a \(<0.01\) re-
sult is interpreted as establishing the implausibility that chance scores
explain the difference. This does not, however, preclude the possibility
that chance or instability of the data does account for the difference.
The risk is that a statistically supported hypothesis will be "interpreted
as convincing evidence of the viability of the experimental hypothesis."\textsuperscript{44}
The present study is not immune to this risk. It can combat this risk
only by interpreting the results against the probability of a Type I or
Type II error.

A second threat to internal validity is history, which is defined as
the incremental events that occur between the pre-test and post-test.
One of the chief advantages of the after-only with control group design
is that history does not intrude as a confounding variable. Historical
effects may well occur, but they do not account for the difference between
the pre-test and post-test since there is no pre-test.

A maturation effect, another threat to internal validity, is one in
which the subject changes during the course of the research. A pre-test,
post-test design is especially susceptible to a maturation effect since
differences in the pre-test, post-test scores may be explained by a change
in the subjects themselves rather than by the experimental treatment.
The after-only with control group design escapes a maturation effect since
it involves only a post-test.

\textsuperscript{43} \textit{Ibid.}, p. 940.

\textsuperscript{44} \textit{Ibid.}
A fourth threat to internal validity is testing. Taking a test once may seriously affect the performance of the subject who takes the same test again after the experimental treatment. In the after-only with control group design there is no testing effect since the subjects take the post-test (the Semantic Differential) only once after the experimental treatment.

Instrumentation is a threat to internal validity no matter what kind of experimental design is selected. Test instruments can change over time either in the manner in which they are used or in the skill with which they are used. The present study was no exception. To combat the effects of instrumentation the investigator used a "canned" presentation for both the verbal comprehension test and the Semantic Differential.

Another threat to internal validity is statistical regression. As Webb and Campbell note, this threat is "particularly significant when groups have been selected on the basis of extreme scores." The problem here is that "subsequent testing may show the group to be less extreme—regressing toward the mean or trend value." A statistical regression did not affect the present study since the study did not pick its subjects on the basis of extreme scores.

Internal validity is also threatened by selection. If there are differential bases used to assign subjects to the experimental and control groups, selection bias may be introduced. Ideally, selection bias is avoided by making the test group assignments completely random. That is, the subjects are first pooled into one large group and then assigned to

45. Ibid., p. 941.
46. Ibid.
the test groups on a random basis. This procedure was impossible in the present study because the subjects were members of a given classroom.

In the study each classroom was designated an experimental or control group depending upon the kind of emotional inducement implemented by the classroom instructor. Thus, selection was not based on the assignment of the subjects to a particular group, but on the choice of inducement a given classroom of subjects was to receive. Clearly, if some prior knowledge of the students on the part of the classroom instructor or the investigator prejudiced the choice of inducement for that group of students, selection would not be random.

To avoid this kind of bias the study did three things. First, it insisted that the participating instructors indicate their willingness to use any one of the three inducements. Second, the choice of inducement was made by the investigator, not the classroom instructor. Finally, the instructor was not informed of this choice until the day he was to use it.

A final threat to internal validity is experimental mortality. For one reason or another, some people invariably drop out during the course of an investigation. When this happens the investigator loses some potentially vital data. The present study had its share of experimental mortality arising chiefly from classroom absences. Some students who were present for Phase II were absent during Phase V. Others who were present for Phase V were absent for Phase II. Since the test scores originating in Phase II and Phase V had to be paired for each subject, the study had no choice but to reject the data obtained from students who missed either phase.
As mentioned earlier, there are threats to external validity as well as threats to internal validity. Threats to external validity are those that call into question the generalizability of the results to a larger population or setting. In the following paragraphs these threats are examined in terms of their implications for the present study.

One threat to external validity is the possibility of an interaction effect on testing. This occurs when there is a carry-over effect from the pre-test to the experimental treatment leading to results that would not appear otherwise. A pre-test may very well increase or decrease the subject's sensitivity or responsiveness to the experimental treatment. If this is the case, the investigator is limited in the inferences he can draw about the effect of the experimental treatment. One of the chief advantages of the after-only with control design is that it eliminates the interaction effect of testing since there is no pre-test.

A second threat to external validity is reactive effects of the experimental arrangements. Unusual experimental arrangements or the novelty of testing can lead to undesirable results akin to a halo effect. The subjects do not perform as they would normally because they know or suspect they are participating in an experiment.

The study combatted this threat in two ways. First, the laboratory setting was the classroom. While the classroom may not be normal in the extreme sense of the word, or normal in terms of a larger segment of the population, it was normal with respect to the kind of subjects the study used. It seemed reasonable to assume that to students the classroom would be less novel than a specially contrived laboratory setting.
The second means of combatting a reactive effect was the unobtrusive approach the study used. The students did not know they were participating in an experiment, nor did they know that the classroom instructor's efforts to implement the emotional inducement had anything to do with the investigator's subsequent appearance in the classroom. As far as the students knew, the investigator's appearance represented nothing more than the desire to conduct the second part of what had been represented as a routine survey. The investigator administered an "after" measurement and this act of testing implied a certain novelty. The study assumed, however, that the novelty of testing under the guise of a survey would be less intense than the novelty of testing under known experimental conditions.

A third threat to external validity is measures of effect that include irrelevant or unknown components. The study attempted to minimize this threat by:

1. using a control group.
2. using a sample of sufficient size.
3. assigning the inducements on a random basis.
4. using canned presentations to administer tests and implement inducements.
5. using measurement instruments that had been tested for reliability and validity.
6. using an after-only with control group design which eliminated the effects of history, maturation, testing, statistical regression, and interaction effects on testing.

While the above features reduce the effect of irrelevant or unknown components on measurements, they do not eliminate them. This is especially true
with regard to item six. The after-only with control group design is deficient in that it does not ensure initial comparability of the test groups. Here the investigator faces a trade-off decision. Is it better to have initial comparability of the test groups (which is determined by the pre-test) and face the hazards of history, maturation, testing, etc., or is it safer to avoid these threats by facing an after-only with control design which raises the specter of irrelevant or unknown components arising from a lack of initial comparability? This study selected the latter alternative since, as Webb and Campbell state, internal validity is the basic minimum without which an experiment is uninterpretable.

A moment's reflection suggests that each of the aforementioned threats to internal and external validity constitutes a rival hypothesis. The study used the after-only with control group design precisely because it negates at least five rival hypotheses. The effect of the remaining rival hypotheses can be lessened by rigid adherence to the research design, by consistency in the manner of conducting the research, and by care in interpreting the results.

B. The Data Collection: Procedure and Acquisition

In the following subsections the text discloses the details of data collection. The first subsection treats the matter of gaining approval of the study. The next subsection explains the procedure followed by the investigator in gaining access to the universities selected as test sites. The final subsection identifies the schools and classes by name and date of entry. Here also are reported the instances where the data collection procedure had to be modified because of scheduling problems.
1. The Study Obtains Approval

Louisiana State University, Baton Rouge, has a university-wide requirement that any experimental undertaking using animal or human subjects must first be approved by its Committee on Use of Humans and Animals as Research Subjects. This committee, chaired by Dr. R. B. Lank, School of Veterinary Medicine, reviews all incoming proposals to determine whether the proposed research threatens its animal or human subjects.

As the first step in the data collection effort, the investigator presented a proposal of the present study to Dr. Lank in June, 1973. Dr. Lank, and a medical advisor to the Committee, reviewed the proposal and issued a letter to the investigator (at the latter's request) dated July 10, 1973. The letter states:

It is recognized a significant part of the proposal will be completed at locations other than LSU-BR. These planned activities, if they were to be scheduled on the Baton Rouge Campus, would comply with the accepted principles relative to safeguarding the rights and welfare of humans as research subjects.47

Since all of the data collection occurred at colleges and universities other than Louisiana State University, Baton Rouge, the investigator felt obliged to offer to all participating faculty evidence that the study was in compliance with accepted guidelines for such research.48 Each faculty member received a copy of the letter before any research was undertaken.

47. The original draft of the letter appears in Appendix A, p. 116.

48. None of the participating colleges or universities had similar university requirements pertaining to experimental research with human subjects.
2. The Study Gains Access to the Test Sites

The next step in the data collection effort involved gaining access to the colleges and universities. The investigator located the names and telephone numbers of deans, chairmen, or department heads of business schools in universities and colleges located within a 150-mile radius of Baton Rouge, Louisiana, and San Antonio, Texas.

The investigator telephoned each dean or department head, explained the details of the study, requested permission to conduct research on the respective campuses, and then asked the respondent to suggest a faculty member to participate in the study. The investigator asked that the recommended faculty member be one who would meet, in the judgment of the respondent, the following criteria:

1. Be willing to participate in the study.
2. Be confident enough of his rapport with the students to use any of the inducements.
3. Be currently teaching an undergraduate business course.

The investigator next telephoned the recommended faculty members. The faculty members were briefed on the study and asked if they would be willing to participate. If they answered in the affirmative, the investigator then inquired about the date of their next regularly scheduled examination. Once this date was determined, the investigator scheduled his first entry into the classroom.

On the date of the first entry into the classroom the investigator met with the faculty member a few minutes before the class began. Several events took place at this meeting.
1. The faculty member was asked to introduce the investigator at the beginning of the class hour and to tell the students that the investigator would explain his presence.

2. The investigator gave the faculty member two documents: a copy of the letter from the Committee on Use of Humans and Animals as Research Subjects, and the Instructions for Implementing the Positive, Neutral, or Negative Inducements.

3. The investigator asked the faculty member to read the instructions so the former could answer any questions.

4. The investigator made arrangements for his second entry into the classroom. This entry was scheduled for the last fifteen minutes of the class period selected as the one in which the faculty member would implement the emotional inducement.

The next step in the data collection involved the investigator's first entry into the classroom. After being introduced by the classroom instructor, the investigator delivered a cover story. The cover story explained why the investigator was there, asked the students to identify themselves by student number only, and established the expectation of a return visit.49

The investigator then administered the first test used in the study, the Employee Aptitude Survey—Test 1, Verbal Comprehension.50 After the allotted time was up, the investigator collected the tests and left the classroom with a reminder that he would "return in a week or so with the second survey."

49. The cover story, a canned presentation, appears in Appendix B, p. 118.

50. Psychological Services, Inc., 4311 Wilshire Boulevard, Los Angeles, California.
On the second entry into the classroom the investigator arrived fifteen minutes before the end of the class period. The faculty member had already implemented the appropriate inducement at the beginning of the class period. The investigator greeted the class, reminded the students that he was there to conduct the second survey, and then gave instructions for taking the Semantic Differential. The students were asked to put only their student numbers on the test papers. After collecting the completed tests, the investigator made a full disclosure of the experimental nature of the study.

3. The Study Discloses the Sites Selected for Data Collection

As noted above, the investigator made a full disclosure of the experimental nature of the study as soon as the students completed the Semantic Differential. For control purposes, this disclosure meant the study could use but one class per university. If more than one class per university were used, the resulting leakage (unless carefully controlled) could cause the study to lose the advantage of its unobtrusive approach. For this reason the data collection spanned nine universities in Texas and Louisiana and, with the exception of Louisiana State University-New Orleans, used only one class per campus.

The students were all members of undergraduate business classes taught at the respective universities. Table 1 summarizes the pertinent details of the data collection.

The table shows that the test subjects were all in morning classes except for the class at Our Lady of the Lake University. The first five schools listed were visited during the summer session, 1973. The last
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four schools were visited during the fall semester, 1973. The entire data collection effort spanned a time frame of approximately six months. Although the investigator made every effort to comply with the aforementioned research sequence, there were circumstances that necessitated some slight modifications. These adjustments were brought about by the fact that the two classroom entries had to be scheduled around the faculty member's examination. Since the exam dates tended to cluster in both the summer and fall sessions, it was not possible to keep constant across all schools the elapsed time between the first and second entry into the classroom.

The most extreme adjustment to the research procedure occurred at Southeastern Louisiana State University. At this site it was not possible to schedule the first entry prior to the date of the regularly scheduled exam since the instructor had already planned the exam for the day after the investigator's first contact with him. Since this was the only exam scheduled (other than the final exam) the investigator had no choice but to proceed with the second entry activities. The investigator entered the classroom near the end of the period of the appointed day (after the date of the exam), delivered the cover story, and then administered the Semantic Differential (the instructor had implemented the emotional induction at the beginning of the class period). The verbal comprehension test, normally given in the first entry, was left with the instructor, who administered it at a later date and mailed the results to the investigator. In short, there was no first entry at this test site.

51. The faculty member was supplied with a copy of the instructions for administering the verbal comprehension test.
A second modification of the research procedure occurred at Northwestern State University. At this site it was not possible to schedule the first and second entry around the intervening date of the instructor's exam. The exam actually took place before the date of the first entry. The first and second entries were scheduled on consecutive days and this test site ended up with the shortest elapsed time between entries.

The final modification of the research procedure occurred at Louisiana State University-New Orleans. Here, at the insistence of the participating faculty member, the investigator used two classes from the same school. The classes, however, were both taught by the same instructor, and met back-to-back in the same classroom. Since the instructor could control access to and from the classroom, and did so, interaction between students coming and going was held to an absolute minimum.

As the foregoing comments indicate, one of the most difficult aspects of the data collection process was scheduling. With nine different faculty members across nine different universities teaching ten different classes and giving ten different exams at ten different times, it is not surprising that some modification of the research procedure was necessary. The study had no choice but to adjust to this scheduling dilemma.

C. The Instrumentation of the Study

As noted earlier, this study is designed to test the effect of two independent variables on a dependent variable. The independent variables are the emotional state of mind and communication skill levels of the
test subjects. The dependent variable is the meaning given communicated messages by these subjects.

The study used two test instruments to record the experimental data and a specially designed mechanism for implementing the emotional inducements. The first test instrument was a verbal comprehension test which the study used to measure the communication skill levels of the test subjects. The second test instrument, the Semantic Differential, the study used to measure the meanings given communicated messages by the test subjects. The final instrumentation device was the mechanism the study used to implement the emotional inducements. In the following subsections the study discusses each of these in detail and in the same order in which they were used in the research undertaking.

1. *The Test to Measure Communication Skill Levels*

   The study used one standardized, timed test to measure the communication skill levels of the test subjects. The test was the *Employee Aptitude Survey—Test 1, Verbal Comprehension*, published by Psychological Services, Inc., Los Angeles, California.52

   The test is confined to a single sheet with instructions and practice problems on one side and the test problems on the other. The test contains thirty test words. The subject reads the test word and then selects from among the following four words the one that means the same or about the same as the test word. The subjects have five minutes to complete the test.

   52. A copy of the test and the instructions for its administration appear in Appendix C, pp. 121-122.
According to the authors of the test, the Employee Aptitude Survey—
Test 1, Verbal Comprehension measures:

... the ability to understand words and the ideas associated with them; to use words in thinking, and communication. People high in this ability are able to understand written and spoken instructions, absorb training rapidly, communicate ideas clearly and persuasively, and quickly make sense out of manuals or written instruction. 53

More specifically, the test is designed to "measure ability to use words in oral and written communication and in planning." 54

The test, developed by Dr. Glen Grimsley and Dr. James S. Ford, is based on a large pool of test words given to several groups "ranging from college students to prisoners at the Chino Honor Farm and including several hundred hourly workers at Lockheed Aircraft Corporation and at the United States Rubber Company in Los Angeles." 55 For each word in the pool of test words the authors calculated a difficulty score which became the basis for including the item in the final form of the test now on the market.

Of special interest to the present study is the fact that the Verbal Comprehension Test has been administered to 621 male and 682 female college students at three institutions of higher learning in Southern California. From these tests the authors compile a set of norms which show the earned scores, the percentiles associated with these scores, and the means and standard deviations of the male and female groups. 56 These norms provide

53. Psychological Services, Inc. The Employee Aptitude Survey, Copyright 1963 (an unbound, two-page monograph accompanying the test).


55. Ibid., pp. 4-5.

56. Ibid., pp. 63-64. (The Technical Report contains norms for over fifty job classifications based on over one hundred thousand scores compiled by the authors.)
a means of appraising the test scores obtained by the present study.
This appraisal appears in Section III of the text.

The study selected the *Verbal Comprehension Test* from among other similar tests for several reasons. First, the test required only five minutes to take. Time was an important consideration in the study since the investigator was imposing twice on the faculty member's class time. A test of longer duration might have constituted an unreasonable intrusion. Second, the test featured ease of administration. The test was confined to a single page, appeared in a format familiar to most students, and required no special training to administer. Third, the test was easy to score (the Examiner's Manual explains the scoring in three simple steps). Finally, the study used the *Verbal Comprehension Test* because it has been thoroughly tested for reliability and validity.\(^{57}\)

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57. The authors calculate a coefficient of reliability for the *Verbal Comprehension Test* based on scores obtained from 1,782 subjects. The formula:

\[
rtt = 1 - \left( \frac{\text{S.E.M.}}{\delta} \right)^2
\]

where: S.E.M. = Standard Error of Measurement
\(\delta\) = Standard Deviation

Given \(N = 1,782\), a standard deviation = 6.38, and a S.E.M. = 2.50, the resulting coefficient of reliability is \(rtt = .846\). The coefficient of reliability is a measure of the accuracy of a test score in terms of the proportion of true variance in obtained test scores. The S.E.M. is an indicator of the probable extent of error in scores.

The authors also calculate a measure of the validity of the test by using the Thurstone centroid method of factor analysis. This form of analysis, when applied to two or more different tests, produces a factor loading which is a measure of the extent to which dissimilar tests measure the same factors. The *Verbal Comprehension Test* obtains a factor loading of .71 when factor analyzed with some ten other tests. The factor loading of .71 is defined as "Verbal Comprehension: the ability to use words in thinking and communication" (Ruch and Ruch, *Employee Aptitude Survey Technical Report*, pp. 12-13).
2. The Mechanism to Implement the Emotional Inducements

The mechanism designed to arouse the emotions of the test subjects must be constructed so as to be consistent with (1) the objectives of the research, (2) the setting in which the research is undertaken, and (3) the constraints imposed by the research design.

The experimental treatment in this study involved arousing the emotions of the test subjects. To achieve this objective the study required an inducement with an impact sufficient to produce a genuine emotional arousal. Generally, the greater the intensity of the experimental treatment, the greater the likelihood of obtaining statistically significant differences between the experimental and control groups. Offsetting this objective, however, was another which was the desire of the study to maintain its unobtrusive approach so that the experimental nature of the inquiry would not be detected. If the emotional inducements were so extraordinary that they violated the behavioral expectations of the students, the arousal goal would be achieved at the expense of the goal of unobtrusiveness.

The goal of unobtrusiveness was closely related to the problems associated with the research setting. The inducements were implemented in the classrooms by the classroom instructors. Thus the inducements had to complement normal classroom activities. The inducements had to blend into the instructor's normal activities so that the impact stemming from them arose not from the fact that the instructor engaged in an unusual activity, but from the fact that the instructor engaged in a normal activity in an unusual manner.
One very normal activity is for the instructor to announce the results of an exam. The students expect this event and, if experience is any indicator, approach it with a state of mind that is already somewhat emotionally charged. If in the act of announcing the exam results the instructor intentionally does something calculated to further arouse the emotions of the students, it does not seem likely that his actions will be interpreted as deceptive. Nor does it seem likely that the students will associate the return of an exam with the activities of the investigator later in the same class period. Based on this reasoning, the study tied the emotional inducements to the return of a regularly scheduled exam.

The study provided each classroom instructor with a set of instructions for implementing the emotional inducements.58 The objectives of the inducements were as follows:

**The Negative Inducement.** The negative inducement is designed to arouse a generally unpleasant emotional state of mind in the students. The actual emotion evoked by the inducement, be it anger, resentment, rage, or irritation, is of little consequence to the study. What is important is that the students be aroused to a level of emotional intensity higher than normal for the classroom where an exam is being returned.

**The Neutral Inducement.** The neutral inducement is designed for those students who will act as control groups for the study. There is no emotional inducement.

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58. A copy of the instructions appears in Appendix D, pp. 124-130.
The instructor is to follow the same sequence of events as the experimental groups, but beyond this the instructor should do nothing to arouse the emotions of the students above the normal level to be expected in the classroom where exams are being returned.

*The Positive Inducement.* The positive inducement is designed to arouse a generally pleasant emotional state of mind in the students. The actual emotion evoked by the inducement, be it joy, elation, relief, or delight, is of little consequence to the study. What is important is that the students be aroused to a level of emotional intensity higher than normal for the classroom where an exam is being returned.

The instructions received by each faculty member outlined the steps to implement the inducements. The instructions were as follows.

1. The instructor was to walk into the classroom with the exams displayed where the students could see them. He was to time his entry so that he arrived as the bell rang.

2. The instructor was to make three announcements (in the order below):
   (a) that he would put the grade distribution on the blackboard;
   (b) that he would continue with his lecture where he left off last time;
   (c) that he would pass out the exams at the end of the period.
3. With some wording like "Here is the grade distribution from your exam," the instructor turned and put one of three grade distributions on the blackboard.

(a) If he was implementing the negative inducement he put up a distribution that was unusually high.

(b) If he was implementing the neutral inducement he put up a distribution that was normally distributed.

(c) If he was implementing the positive inducement he put up a distribution that was unusually low.

4. The instructor then made one of the following sets of announcements.

(a) If he was implementing the negative inducement he said: "The grades are too high so I'm going to attach a ten-point negative curve."

He justified this statement by saying: "I think the exam was too easy."

"I think every exam should produce some A's, B's, C's, D's, and F's."

"It is fair to curve grades down because if they had been too low you would insist I curve them up."

(b) If he was implementing the neutral inducement he said: "The test scores are quite normally distributed over the grade range."

He then said: "I think the exam was at the right level of difficulty."
"The exam has produced a good sprinkling of A's, B's, C's, D's, and F's."
"The exam indicates the competence of the students very well."

(c) If he was implementing the positive inducement he said: "The grades are too low so I'm going to attach a ten-point positive curve."
He justified this statement by saying: "I think the exam was too hard."
"I think every exam should produce some A's, B's, C's, D's, and F's."
"It is fair to curve grades up because the best work ought to receive an A."

5. The instructor then turned back to the blackboard and put up a second grade distribution which reflected the results of the announced curve.

(a) If he was implementing the negative inducement the second distribution was ten points below the first one. (The relative position of the test scores remained the same, but all were lower. Both distributions were left on the board for the remainder of the class period.)

(b) If he was implementing the neutral inducement he did not put up a second distribution but merely commenced his lecture.
(c) If he was implementing the positive inducement the second distribution was ten points above the first one. (The relative position of the test scores remained the same, but all were higher. Both distributions were left on the board for the remainder of the class period.)

The instructor then commenced his regular lecture. He did not return the exams and the students had no idea what their individual grades were. In the negatively induced classes the students knew only that all grades had been curved down. The best and the worst students alike had been treated somewhat harshly by their instructor. In the positively induced groups the students knew only that all grades had been curved up. The best and the worst students alike had been treated somewhat beneficently by their instructor. In the neutrally induced group the students knew only that the grades were normally distributed.

The inducements were designed to produce something akin to like response among subjects receiving like inducements. In the positive inducement, for example, it seemed reasonable to assume that all students would be pleased to receive an upward curve whether they were typically A students or D students. Similarly, it was assumed that all students would be displeased to receive a downward curve no matter what their typical level of performance.

Once the inducements were implemented the instructor commenced his regular lecture. Toward the end of the class period the investigator entered to conduct the "after" measurement.
3. The Technique for Measuring the Meanings Given Communicated Messages

The "after" measurement involved the Semantic Differential as the means of measuring the meanings given communicated messages by subjects who had received certain emotional inducements and who were characterized by high, medium, or low communication skill levels.

As Darnell states, "To speak of the Semantic Differential is misleading . . . semantic differentiation is a procedure that involves rather standard scaling practices and a variety of analytical methods."59 As the quote implies, the Semantic Differential is not a fixed test or instrument, but a procedure generally designed to fit the purposes of the study in which it is used.

The present study used the Semantic Differential to measure the meanings of five one-word terms. The terms, or concepts, as they are frequently called, were drawn from the original list of twenty used by Osgood and his associates to develop the Semantic Differential.60 The terms were SWORD, SYMPHONY, COP, PATRIOT, and RUSSIAN. As in the original twenty, the terms met the criteria of being as diversified in meaning as possible and yet familiar to all test subjects. They also qualified on the grounds that they were not likely to be associated with the experimental treatments used in the study. If concepts like FAIRPLAY, TESTS, GRADES, EVALUATION, or TEACHER were used there might well have been an


interplay between the experimental treatments and the "after" measurement resulting in an undesirable bias of the test instrument.

The five concepts were each accompanied by a set of fourteen bipolar adjectives also drawn from the Osgood studies. Twelve of the bipolar adjective scales were evaluative scales and were selected from Osgood's original list of fifty on the basis of having the ability to elicit the highest factor loadings when subjected to Thurstone's centroid factor method. The remaining scales were potency scales and were selected in the same manner. As Kerlinger points out,

Through research, Osgood has found that, when analyzed, adjective pairs like good-bad, bitter-sweet, large-small, and clean-dirty fall into clusters. The most important cluster seems to consist of adjectives that are Evaluative, such as good-bad and pleasant-unpleasant. A second cluster has adjectives that seem to share strength or Potency. Strong-weak and rugged-delicate are examples.

What Osgood discovers is that when selected concepts are evaluated against a set of bipolar adjective scales, the scales generally considered as evaluative account for most of the variation in meaning attributed to the selected concepts. As Osgood states, "the evaluative factor plays a dominant role in meaningful judgements, here accounting for almost 70 percent of the common (extracted) variance." For this reason the study used principally evaluative scales. The scales were:

61. Ibid., p. 37.
63. Osgood, op. cit., p. 38.
pleasant - unpleasant
fragrant - foul
beautiful - ugly
sweet - sour
clean - dirty
honest - dishonest
nice - awful
fair - unfair
good - bad
sacred - profane
sweet - bitter
kind - cruel
large - small*
strong - weak*

* = potency scales

The study consolidated the concepts and scales into a five-page test.64 One concept appeared at the top of each page and beneath the concept appeared the fourteen bipolar adjectives. The scales were separated by intervals with values ranging from seven at the positive end of the scale to one at the negative end.

Good: _____: _____: _____: _____: _____: _____: _____ Bad
(7) (6) (5) (4) (3) (2) (1)

The study used a seven-interval scale between each bipolar adjective chiefly because this was the interval arrangement used by Osgood. But as Nunnally points out,

As the number of scale steps is increased from 2 up through 20, the increase in reliability is very rapid at first. It tends to level off at about 7, and after 11 steps, there is little gain in reliability from increasing the number of steps.65

64. A copy of the Semantic Differential (and the instructions for its use) appears in Appendix E, pp. 132-138.
A related question concerning the number of steps in a scale is whether the steps restrict the user's choices or overwhelm his powers of discrimination. As Guilford states,

If we use too few steps, the scale is obviously a coarse one, and we lose much of the discriminative powers of which raters are capable. On the other hand, we can grade a scale so finely that it is beyond the rater's limited powers of discrimination. The fineness will also depend upon the willingness of raters to make the effort to use the discriminative powers they have.66

The study used an odd number of steps in the scale intervals rather than an even number. Quoting Nunnally,

The argument for an odd number of steps is that it permits the use of a middle step meaning "neutral," "neither," or "neither agree nor disagree." This is thought to make subjects more "comfortable" in making ratings, and it can also be argued that subjects frequently have neutral reactions which should be measured.67

Osgood comments on the use of the seven-interval scale by stating that, "Over a large number of different subjects in many different experiments it has been found that with seven alternatives all of them tend to be used and with roughly, if not exactly, equal frequencies."68

The study made several adjustments in its use of the Semantic Differential. To guard against what Osgood calls "position preferences" the scales appearing with each concept were alternated in polarity direction on each page. The order in which the scales appeared from page to page

was changed to prevent the subjects from falling into a set response pattern. Finally, the concepts appearing at the top of each page were rotated from test to test so that no one concept was consistently the first one to be rated.

To administer the Semantic Differential the investigator read a set of instructions taken from Osgood's book. The instructions included (1) an orientation to the general nature of the task, (2) the meanings of the scale positions and how the students were to interpret them, and (3) some comments about the attitude the subjects should take toward rating the concepts (e.g., speed, first impressions, independent judgments).

With each subject rating five concepts across twelve evaluative scales and two potency scales, and with each scale having a possible value of one to seven points, the total score range for a given subject was 60 to 420 for the evaluative scales and 10 to 70 for the potency scales (the evaluative and potency scales were scored separately). Scoring the test was a matter of summing up the scale designations of each concept, keeping separate the totals for the evaluative and potency scales. The study thus developed several measurements of meaning for each subject. One was a combined measurement where the evaluative (or potency) ratings of all five concepts were combined into a single score. The other was a single concept evaluative (or potency) rating resulting in five measurements per subject.

As Kerlinger states, the scores of the Semantic Differential "can be analyzed for differences between concepts, between scales, between

subjects, or any combination thereof." For example, it might be of interest to find out how much alike are terms like "father" and "dad" to a given group of subjects. Here, clearly, the Semantic Differential can be used to measure the similarity, or lack of it, of the two concepts. It might be of interest to find out the meaning of a certain concept with respect to certain scales. The concept "wrestler" might be more meaningful with respect to potency scales than activity scales. Of interest to the present study, however, is the fact that the Semantic Differential scores can be analyzed for differences between subjects.

In the present study all subjects rated the same concepts across the same set of scales. Some of the subjects received the positive inducements, some the negative inducements, and some the neutral inducements. The central question was whether the dissimilar inducements would lead to dissimilar meanings.

Thus, the study did not attempt to measure the meaning of the five concepts in terms of a presumed "semantic space." Nor did the study attempt to locate the concepts along a "finite number of independent dimensions serving to differentiate the positions of concepts within that space." Instead, the study interpreted "differences in the patterns of check marks on the scales as representing differences in groups of subjects judging the same concepts." The study measured meaning only to the extent that it obtained from all subjects a Semantic Differential score. If the scores among subjects in the experimental groups differed markedly from the scores among subjects in the control groups,

70. Kerlinger, op. cit., p. 572.
71. Darnell, op. cit., p. 182.
72. Ibid.
the study interpreted this as indicating that the concepts had different meanings for the subjects.

In summary, the study used two measurement instruments and a specially designed mechanism for implementing the emotional inducements. The first test instrument was the *Verbal Comprehension Test*, which the study used to measure the communication skill levels of the test subjects. The study used the Semantic Differential for the "after" measurements. The mechanism for implementing the emotional inducements was the return of a regularly scheduled exam in which the instructor arbitrarily changed the grade distributions.

**D. Methods of Analysis**

The principal analytical technique in this study is the two-way analysis of variance.73 This technique permits the investigator to test simultaneously for the effects of two classes of treatments or factors. The first factor is the type of emotional inducement (positive, neutral, negative) and the second factor is the communication skill level (high, medium, low). The two-way analysis of variance determines whether either factor (or both) is accountable for the differences in the "after" measurements (the meanings given five selected terms as measured by the Semantic Differential). The two-way analysis of variance also determines whether there is a significant interaction of the two factors.

In the following subsections the paper discusses the operation of the two-way analysis of variance, the manner in which it is used in the present study, and the suitability of the technique with respect to the type of data measurements made by the study.

1. The Two-Way Analysis of Variance

Since the purpose of experimental manipulation is to increase the difference between the means of the test groups, and since the experimental manipulation, if influential, will show up in differences between means above and beyond the differences that would arise by chance alone, the between-group means can be used as a measure of the experimental influence.

The analysis of variance, however, does not operate with group means directly. Instead, it operates with two kinds of variance, between-groups variance and within-groups variance. "Between-groups variance is the variance that reflects systematic differences between groups of measures."74

Within-groups variance, or more properly error variance, "is the fluctuation or varying of measures due to chance."75 In an experimental undertaking the experimental treatment is designed to lead to a difference between the measures taken from the experimental and control groups. If the measures do differ, part of the difference may come from the experimental treatment and part may be due to random fluctuations or error. To account for the effect of the experimental treatment the researcher must be able to separate the systematic variation from the variation due to error. This is precisely what the two-way analysis of variance does.


75. Ibid., p. 100.
The analysis of variance leads to the calculation of an $F$ value.\textsuperscript{76} The $F$ value is computed by dividing the within-groups variance (error variance) into the between-groups variance. "The rationale here is that if the between-groups variance is significantly greater than the within-groups variance, the added variance must be due to real differences between groups, rather than to chance factors."\textsuperscript{77} If the resulting $F$ value is as great or greater than the appropriate values to be found in an $F$ table, the differences that the between-groups variance reflects are statistically significant.

2. How the Study Used the Two-Way Analysis of Variance

As noted on page 58, the study developed several measures of the dependent variable. The test subjects rated five concepts on a set of scales made up of both evaluative and potency factors. As such, the study tested for significant differences between groups in twelve different ways.

1. Evaluative mean scores: The dependent variable was the mean score of each subject based on the evaluative scale designations across all five concepts.

2. Potency mean scores: The dependent variable was the mean score of each subject based on the potency scale designations across all five concepts.

\textsuperscript{76} Roger L. Burford, \textit{Statistics: A Computer Approach} (Columbus, Ohio: Charles E. Merrill Publishing Company, 1968), p. 168. "$F$ ... is defined to be the ratio of two independent chi-square distributed variables, each divided by its degrees of freedom. Hence $F$ has two degrees of freedom, $V_1$ (the degrees of freedom of the variable in the numerator) and $V_2$ (the degrees of freedom of the denominator)."

3. **Potency-Sword score:** The dependent variable was the score for each subject based on the potency scale designations of the concept SWORD.

4. **Potency-Symphony score:** The dependent variable was the score for each subject based on the potency scale designations of the concept SYMPHONY.

5. **Potency-Cop score:** The dependent variable was the score for each subject based on the potency scale designations of the concept COP.

6. **Potency-Patriot score:** The dependent variable was the score for each subject based on the potency scale designations of the concept PATRIOT.

7. **Potency-Russian score:** The dependent variable was the score for each subject based on the potency scale designations of the concept RUSSIAN.

8. **Evaluative-Sword score:** The dependent variable was the score for each subject based on the evaluative scale designations of the concept SWORD.

9. **Evaluative-Symphony score:** The dependent variable was the score for each subject based on the evaluative scale designations of the concept SYMPHONY.

10. **Evaluative-Cop score:** The dependent variable was the score for each subject based on the evaluative scale designations of the concept COP.
11. Evaluative-Patriot score: The dependent variable was the score for each subject based on the evaluative scale designations of the concept PATRIOT.

12. Evaluative-Russian score: The dependent variable was the score for each subject based on the evaluative scale designations of the concept RUSSIAN.

3. Suitability of the Two-Way Analysis of Variance

There are several assumptions that stand behind the use of an $F$ test, a parametric test, in analysis of variance. One of these is the assumption of normality. That is, it is assumed that the samples one works with are drawn from populations that are normally distributed. If the populations from which samples are drawn are not normal, then presumably those statistical tests that depend on the normality assumption are vitiated. As Kerlinger states, "Some teachers urge students of education and psychology to use only nonparametric tests on the questionable ground that most educational and psychological populations are not normal."\(^78\)

A second assumption concerns the homogeneity of variance. In analysis of variance it is assumed that the within-groups variances are statistically the same. That is, it is assumed that they vary no more than the amount to be expected within the bounds of random variation. The effect of widely differing variances is to inflate the within-groups variance. This, in turn, can render an $F$ test insignificant when in fact there are significant differences between groups.\(^79\)

\(^78\) Kerlinger, *op. cit.*, p. 258.

\(^79\) Since the within-groups variance is the denominator in the $F$ ratio, an overstated denominator will produce an $F$ value that is too small to be significant.
In commenting on the extent to which these assumptions pose real threats, Kerlinger states:

The evidence to date is that the importance of normality and homogeneity is overrated . . . Unless there is good evidence to believe that populations are rather seriously non-normal and that variances are heterogeneous, it is usually unwise to use a nonparametric statistical test in place of a parametric one. The reason for this is that parametric tests are almost always more powerful than nonparametric tests.80

Kerlinger further states that, "unless variances are so heterogeneous as to be readily apparent, that is, relatively large differences exist, the effect on the F test will probably be negligible."81 Based on this reasoning, the present study used the F test on the assumption that the data were normally distributed and that there was homogeneity of variance.

A final assumption concerning the analysis of variance is that the measures to be analyzed are truly interval measures, not ordinal or nominal. A true interval measurement is one in which equal intervals and a real zero can be established. In the Semantic Differential the possibility of establishing a "zero meaning" seems rather remote. Furthermore, the intervals of the Semantic Differential scales can only be assumed to be equal. The scales do not measure "amounts" of meaning, but rather rank-order positions of the meanings of the concepts to the raters. Strictly speaking, the only significance tests appropriate to ordinal measures are sign tests and run tests. But, as Kerlinger states, "If only these statistics (and others like them) are legitimate, how can statistics like r, t, and F be used with what are in effect ordinal measures? And they are so used, without a qualm by most researchers."82

81. Ibid., p. 259.
82. Ibid., p. 426.
The answer rests with the fact that "it is probable that most psychological and educational scales approximate interval equality fairly well."\textsuperscript{83} And, "though most psychological scales are basically ordinal, we can with considerable assurance often assume an equality of interval."\textsuperscript{84} Kerlinger suggests that, "The best procedure would seem to be to treat ordinal measurements as though they were interval measurements, but to be constantly alert to the possibility of gross inequality of intervals."\textsuperscript{85} Based on this reasoning, the present study assumed interval equality in its use of the Semantic Differential. Guilford justifies this assumption by stating that

\textldots experimental data often approach the condition of equal units sufficiently well that there is tolerable error in applying the various statistics that call for them. This is one of those occasions for making use of approximations, even gross ones, in order that one may extract the most information from his data.\textsuperscript{86}

As this section of the text indicates, the study used an after-only with control design in a modified form consisting of two principal experimental groups and one control group. The experimental groups received dissimilar emotional inducements that were built into the activity of returning an exam. The investigator made two entries into the classroom, once before and once after the inducements were implemented. The first entry involved administering a verbal comprehension test to determine the communication skill levels of the subjects. The second entry involved

\begin{itemize}
  \item \textsuperscript{83} \textit{Ibid.}, p. 427.
  \item \textsuperscript{84} \textit{Ibid.}, p. 426.
  \item \textsuperscript{85} \textit{Ibid.}, p. 427.
  \item \textsuperscript{86} Guilford, \textit{op. cit.}, pp. 15-16.
\end{itemize}
administering the Semantic Differential to test the meanings the subjects gave to five one-word concepts. The analysis consisted of a cross-comparison of the extent to which either main effect (the type of inducement or the subject's communication skill level) was accountable for obtained differences in meaning scores.

In the next portion of the study, the discussion leads into the presentation of the findings. Here the paper discloses the sample characteristics, the tests of the hypothesis, and the interpretation of the results.
III. PRESENTATION OF THE FINDINGS

This portion of the text presents the findings of the study. Unfolding in the following subsections is a discussion of the sample characteristics, the arrangement of the subjects in the test groups, the statistical analyses, and the interpretation of the statistical tests in terms of the hypotheses.

Subsection A describes the demographic features of the subjects constituting the sample. Here are reported the pertinent statistics pertaining to size, age, sex, etc., of the sample used in the study.

Subsection B describes the composition of each test group. At this point the text explains the method used to assign the subjects to the high, medium, or low communication skill level categories.

Subsection C presents the statistical analyses. Using either composite or single concept scores derived from either evaluative or potency scales of the Semantic Differential, the text presents twelve different univariate analyses of variance. Each such test is presented and evaluated separately.

Subsection D summarizes the statistical tests and relates the findings to the hypotheses appearing in Section I.

A. Characteristics of the Sample Used in the Study

It is incumbent on the investigator performing experimental research to disclose fully the characteristics of the sample used in the research. These characteristics include not only the size of the sample, how the size was determined, and the adequacy of the sample size, but also those characteristics of the subjects which could conceivably affect the obtained results.
In the following subsections the text discusses first the sample size used in the study. Then the discussion moves into an examination of demographic features of the sample subjects.

1. **Sample Size in the Study**

   The study used a total of 221 test subjects. This total more than met the minimum sample size requirement determined by the investigator through consultation of a standardized table of the power function of analysis of variance tests. The table revealed that a total sample of 180 subjects (or 20 subjects per cell in the $3 \times 3$ matrix appearing on page 11) would produce an F test the power of which was .96. The corresponding probability of a Type II error for a test of this power was .04. Since the study actually used more than 180 subjects, the net effect was to strengthen the power of the F test and to further reduce the probability of a Type II error.

2. **Demographic Features of the Sample**

   When the investigator entered the test sites for the first time to give the verbal comprehension test, he also administered a short questionnaire. The questionnaire did two things. First, it permitted the investigator to screen the sample subjects so as to achieve a reasonable degree of homogeneity among the members of the sample. Second, it permitted the investigator to keep track of those subjects whose unique features might render the test groups non-homogeneous, especially if those subjects all fell into one test group. The questionnaire probed those subject areas which the investigator believed might have an effect on the outcome of the study.

87. A copy of the questionnaire appears in Appendix C, p. 120.
For example, the age of the sample subjects was considered important. Initially, the investigator planned to restrict the study to subjects falling within a narrow age range. This proved to be impossible in light of the difficulty of gaining access to the respective classrooms. In actuality, the ages of the subjects ranged from 17 to 46. In spite of this age range, 82.2 percent of the sample subjects were between ages 17 and 25. Conversely, those between the ages of 26 and 46 accounted for 17.8 percent of the sample.

The investigator believed that national origin and citizenship were important considerations since, ideally, the test subjects should be culturally identical. The questionnaire revealed that 214 of the test subjects were citizens of the United States, while six were not. Similarly, 211 of the subjects had been born in the United States, while nine had not.

The sex of the sample was mixed, with 165 males and 55 females. This distribution was not surprising since the study used only students enrolled in business courses. The study did not attempt to limit the sample to one sex or the other as there seemed little reason to believe that sex would be a confounding variable.

The grade levels of the subjects varied, with the proportion of students at each grade level increasing as the grade level increased. The questionnaire revealed the following:

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Number</th>
<th>Percent of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>29</td>
<td>13.24</td>
</tr>
<tr>
<td>Sophomore</td>
<td>47</td>
<td>21.46</td>
</tr>
<tr>
<td>Junior</td>
<td>59</td>
<td>26.94</td>
</tr>
<tr>
<td>Senior</td>
<td>84</td>
<td>38.35</td>
</tr>
</tbody>
</table>

88. The quantities cited do not always total 221 because there were two subjects who failed to answer all the items on the questionnaire.
It did not seem likely that these grade differentials would affect the subjects' performance on the Semantic Differential. It did seem reasonable, however, to suspect that an increasing grade level would signal an increasingly higher performance on the verbal comprehension test. The investigator explored this possibility and found little evidence of a direct correlation. On the contrary, the performances on the verbal comprehension test, both high and low, seemed to be scattered over the entire grade-level range.

A question of importance to the study was whether English constituted the native tongue of the subjects. For obvious reasons, a study purporting to deal with the effect of emotional inducements on meaning would do well to consider carefully the inclusion of subjects for whom English was not the native tongue. In the present study, 15 students indicated that English was not their native language. However, since these 15 students constituted only 6.81 percent of the sample, and since these subjects were not clustered in any one test group, the investigator elected to retain them in the sample. The placement of these subjects in the test groups appears in Table II.

Closely related to the above question was the matter of the number of subjects who were bilingual. The questionnaire revealed that 34 subjects (15.45 percent of the sample) spoke two or more languages. The results were as follows:

- French .......... 4
- Spanish .......... 30
- German .......... 1
- Italian .......... 1
- Oriental .......... 2

89. One of the chief attributes of the Semantic Differential is that subjects of relatively low intelligence can clearly articulate the meaning selected concepts have for them since the articulation takes place via a scaling mechanism.
The investigator elected to retain these subjects in the sample since an examination of the data revealed that the bilingual ability did not cluster in any single test group. Table II shows the placement of the bilingual subjects in the test groups. It also shows the placement of the subjects for whom English was not the native language.

<table>
<thead>
<tr>
<th>Level of Communication Skill</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Inducement</td>
<td>NE</td>
<td>BL</td>
<td>NE</td>
</tr>
<tr>
<td>NE = 4</td>
<td>NE = 1</td>
<td>BL = 2</td>
<td>NE = 0</td>
</tr>
<tr>
<td>BL = 6</td>
<td>BL = 2</td>
<td>BL = 2</td>
<td>BL = 2</td>
</tr>
<tr>
<td>NE = 3</td>
<td>NE = 3</td>
<td>BL = 7</td>
<td>NE = 2</td>
</tr>
<tr>
<td>BL = 3</td>
<td>BL = 7</td>
<td>BL = 7</td>
<td>BL = 7</td>
</tr>
<tr>
<td>NE = 1</td>
<td>NE = 1</td>
<td>BL = 0</td>
<td>NE = 0</td>
</tr>
<tr>
<td>BL = 6</td>
<td>BL = 0</td>
<td>BL = 1</td>
<td>BL = 1</td>
</tr>
</tbody>
</table>

ΣNE = 8 ΣNE = 5 ΣNE = 2 ΣBL = 15 ΣBL = 9 ΣBL = 10

NE = Those for whom English was not the native language
BL = Those who were bilingual
B. Arrangement of the Subjects in the Test Groups

As noted on pages 45-47, the study measured the communication skill levels of the test subjects. The scores obtained from the Employee Aptitude Survey—Test 1, Verbal Comprehension formed the basis for assigning the subjects into a high, medium, or low skill category.90

The test results revealed (1) that the scores ranged from 1 to 30, (2) that there was, as expected, a clustering of scores around the mid-point of the score range, and (3) that there was sufficient dispersion of the scores to permit the investigator to cast the scores into three levels: high, medium, and low.

The basis for determining the high, medium, and low categories was arbitrary. The investigator merely broke the distribution into three parts, such that each part had approximately the same number of members. The composition of the three categories was as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Skill Group</td>
<td>77</td>
<td>1.00 - 15.33</td>
</tr>
<tr>
<td>Medium Skill Group</td>
<td>74</td>
<td>15.67 - 19.33</td>
</tr>
<tr>
<td>High Skill Group</td>
<td>70</td>
<td>19.67 - 30.00</td>
</tr>
</tbody>
</table>

This breakdown of the data compares favorably with the norms supplied with the test by its authors.91 According to their figures, a score of 1.00 to 15.00 would fall into the lower 30 percentile. This range compares

90. The test scores were calculated on the basis of "rights" minus "wrongs," with a right answer earning one point and a wrong answer subject to a 1/3 penalty point. This means there were 90 different scores possible since the range of the test was 0 to 30.

91. The norms for the Employee Aptitude Survey—Test 1, Verbal Comprehension appear in Appendix F, p. 140. Also appearing in this Appendix is a table showing the array of verbal comprehension scores obtained in the study.
favorably with the range of 1.00 to 15.33 noted above. Again, based on the norms, a score of 16.00 to 19.00 would fall into the middle third of the percentile. In the medium skill group above the scores are 1/3 point higher than this range, but they do approximate it. Finally, according to the published norms, the upper 30 percentile would include scores of 20 to 30. The high skill group above corresponds to this score range.

As might be expected, the scores obtained in the study tended to cluster around the mean. This accounts for the fact that the score ranges for the high and low skill groups are considerably broader than the range for the medium skill group.92

Based on the foregoing discussion it is now appropriate to show the arrangement of the subjects in the test groups. This arrangement appears in Table III below.

Table III shows the number of subjects that constituted each test group. In every cell but one (the neutral-medium group) the sample met or exceeded the minimum cell size requirement.93 Against this configuration the study made all of the statistical tests. These tests form the subject matter of the next section of the text.

92. Based on a total sample of 221 subjects, the Verbal Comprehension Test produced a mean = 17.24 and a standard deviation = 4.94. These results compare favorably with the statistics reported in the Employee Aptitude Survey Technical Report, where the authors obtain the following:

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male College Students</td>
<td>621</td>
<td>17.6</td>
<td>4.8</td>
</tr>
<tr>
<td>Female College Students</td>
<td>682</td>
<td>18.0</td>
<td>4.3</td>
</tr>
</tbody>
</table>

93. See page 69 for a discussion of the required sample size.
### TABLE III
ARRANGEMENT OF THE SUBJECTS IN THE TEST GROUPS

<table>
<thead>
<tr>
<th>Level of Communication Skill</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Inducement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pos</td>
<td>n = 21</td>
<td>n = 32</td>
<td>n = 20</td>
</tr>
<tr>
<td>Neut</td>
<td>n = 29</td>
<td>n = 16</td>
<td>n = 20</td>
</tr>
<tr>
<td>Neg</td>
<td>n = 27</td>
<td>n = 26</td>
<td>n = 30</td>
</tr>
<tr>
<td>Total Negative</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Neutral</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Positive</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Low</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Medium</td>
<td>74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total High</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total N = 221

---

**C. The Statistical Analyses of the Study**

The dependent variable in the study was the meaning given five selected concepts on the Semantic Differential by subjects who had received a given emotional inducement and who were characterized by a given communication skill level. The five concepts were evaluated against a set of evaluative and potency scales. Thus, as noted on pages 62-64, the study developed twelve different ways to test for significant differences between groups. In the following paragraphs the text discusses each of these tests (all of which were made against an α level of .05).
1. *Tests of the Evaluative Mean Scores*

The first test run on the data used an *Evaluative Mean* score. This score was derived by first summing the evaluative scale designations for each concept and then adding these sums and dividing by five. This process was repeated for each subject in the study. Thus, each subject's evaluative scale designations across all five concepts were reduced to a single evaluative mean score for that subject. The evaluative mean scores for all subjects were then fitted to the aforementioned matrix and tested for significant differences between groups. The test results appear in Table IV.

![Table IV](image)

Table IV shows the results of three different statistical tests. In the *Source* column the term "Inducements" refers to the test for significant difference between groups receiving dissimilar emotional inducements. The
term "Verbal Skills" refers to the test for significant difference between groups with different communication skill levels. The term "Interaction" refers to the test for significance of interaction between the types of inducement and communication skill levels.

The data in Table IV suggest that there was a significant difference in the meanings given communicated messages by subjects receiving dissimilar emotional inducements. In more exact terms, the table shows that the probability of getting an F value as large as or larger than 5.47 when the null hypothesis (no difference between groups) is true, is .0052. Thus, the study rejects the null hypothesis. The probability of a Type I error (rejecting the null hypothesis when it is true) in this instance is .0052.

The data in Table IV suggest that there was no significant difference in the meanings given communicated messages by subjects with differing communication skill levels. Likewise, the data suggest that there was no significant interaction. The stated probabilities (.2491 and .2823, respectively) are both well above the .05 alpha level. Therefore, the study accepts the null hypothesis. The probability of a Type II error (accepting the null hypothesis when it is false) in this instance is .04.

The foregoing statistical considerations suggest rather strongly that the meanings given communicated messages vary, depending upon the emotional inducements received by the subjects. The study did obtain a statistically significant difference in meaning between the positively, negatively, and neutrally induced groups. This finding lends some support to the general belief that emotion affects the meaning given incoming stimuli.
2. Tests of the Potency Mean Scores

A second test run on the data used a Potency Mean score. This score was derived in exactly the same fashion as the Evaluative Mean score except that it used potency scale designations instead of evaluative scale designations. The test results appear in Table V.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>6.52</td>
<td>3.26</td>
<td>2.41</td>
<td>.0905 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>2.24</td>
<td>1.12</td>
<td>.82</td>
<td>.5582 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>8.84</td>
<td>2.21</td>
<td>1.63</td>
<td>.1664 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>287.30</td>
<td>1.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>304.90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The data in Table V suggest that there was no significant difference in the meanings given communicated messages by subjects receiving dissimilar emotional inducements. Likewise, there was no significant difference in the meanings given communicated messages by subjects with differing communication skill levels. In addition, there was no significant interaction. While none of these tests was significant at the .05 level, it is worth noting that the test coming closest to significance was the test of differences between groups receiving dissimilar emotional inducements.
A valid question to be raised here is why the study got significant difference with the Evaluative Mean scores but did not with the Potency Mean scores. One reason may be that the evaluative scales have consistently been shown to be more sensitive. That is, they are more likely to obtain a wider range or greater magnitude of responses.  

A second reason is that there were only two potency scales listed with each concept to be evaluated by the subjects. Two scales per concept (compared with twelve evaluative scales) may have been insufficient to register significant differences.

3. Tests of Single Concept-Potency Scores

A third series of tests run on the data involved the use of a single concept score. Here, all subjects were compared on the basis of the potency (or evaluative) scale designations of a single concept. Since there were five concepts, each of which was rated by all subjects on both evaluative and potency scales, a total of ten different single-concept tests emerged. The chief reason for making tests on a concept-by-concept basis was that such an analysis permitted the investigator to determine which specific concepts were responsible for the obtained differences. In addition, it seemed highly unlikely that all concepts would produce like response patterns across all test subjects.

a. Potency-Sword score test

Table VI presents the tests of the data based on the potency scale designations for the single concept Sword.

94. See pp. 55-56 for further elaboration of this statement.
<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>5.04</td>
<td>2.52</td>
<td>.71</td>
<td>.5011 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>5.39</td>
<td>2.69</td>
<td>.75</td>
<td>.5250 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>42.22</td>
<td>10.55</td>
<td>2.95</td>
<td>.0207 (S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>757.03</td>
<td>3.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>809.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The data in Table VI suggest that there was a significant interaction effect. This meant that the independent variable (type of inducement) operated one way at one communication skill level and in a different way at another communication skill level.95

The nature of this interaction effect is best explained by examining the data themselves. In Graph 1 below, the means of the potency-sword scores for each test group are presented. The graph shows that as the communication skill level of the negative group rises, so do the potency-sword scores. On the other hand, as the communication skill level of the positive group rises, the potency-sword scores fall. The pattern of the neutral group is identical to that of the positive group.

The frustrating aspect of an interaction effect is that it is impossible to determine which main effect accounts for the difference. An interaction effect means that both independent variables (types of inducement

95. This was the only test in the entire study which resulted in a significant interaction effect.
and communication skill levels) act in concert to produce the variation in scores. What occurs in Graph 1 is what may be called a classical or symmetrical interaction effect. That is, in the negative group a low communication skill level is associated with a low potency-sword score. In the positive group a low communication skill level is associated with a high potency-sword score. Conversely, in the negative group a high communication skill level is associated with a high potency-sword score; and in the positive group a high communication skill level is associated with a low potency-sword score. In other words, the independent variables operate in different directions in different test groups.
b. **Potency-Symphony score test**

Table VII presents the tests of the data based on the potency scale designations for the single concept *Symphony*.

![Table VII](image)

The data in Table VII suggest that there was no significance of any kind in this test. Therefore, the study accepted the null hypothesis and did so at a .04 probability of committing a Type II error.

c. **Potency-Cop score test**

Table VIII presents the tests of the data based on the potency scale designations for the single concept *Cop*. As in the previous example, there was no significance obtained and, therefore, the study accepts the null hypothesis of no difference between groups.
TABLE VIII
ANALYSIS OF VARIANCE TEST OF THE POTENCY-COP SCORE

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>13.20</td>
<td>6.60</td>
<td>2.04</td>
<td>.1303 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>.25</td>
<td>.12</td>
<td>.03</td>
<td>.9612 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>16.97</td>
<td>4.24</td>
<td>1.31</td>
<td>.2656 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>685.85</td>
<td>3.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>716.27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

d. Potency-Patriot score test

Table IX presents the tests of the data based on the potency scale designations for the single concept Patriot.

TABLE IX
ANALYSIS OF VARIANCE TEST OF THE POTENCY-PATRIOT SCORE

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>23.42</td>
<td>11.71</td>
<td>3.08</td>
<td>.0463 (S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>2.93</td>
<td>1.46</td>
<td>.38</td>
<td>.6856 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>26.29</td>
<td>6.57</td>
<td>1.73</td>
<td>.1428 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>804.34</td>
<td>3.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>856.98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The data in Table XI suggest that there was a significant difference in the meaning given a communicated message by subjects receiving dissimilar inducements. The other tests did not detect any significance.

Examination of the data reveals the nature of the obtained significance. Using the means of the potency-patriot scores for each test group, Graph 2 illustrates the nature of the differences between groups receiving dissimilar emotional inducements. Examination of the graph shows that the principal difference occurs in the low skill levels of the negative and positive groups. Here the mean potency-patriot scores vary by as much as 1.99 points.

GRAPH 2. Illustration of the Significant Differences Between Groups Obtained with the Potency-Patriot Score

Source: Primary
(11.80 - 9.81 = 1.99). The largest variation among any of the remaining skill level groups is .39 (10.65 - 10.26 = .39). Also to be noted from Graph 2 is the fact that all scores in the negative group are lower than all scores in the neutral group, which in turn are lower than all scores in the positive group. This trend occurred throughout most of the tests run in the study. It suggests that the negative inducements tended to drive evaluations down below those of the neutral group, while the positive inducements tended to push evaluations above those of the neutral group.

e. **Potency-Russian score test**

Table X presents the tests of the data based on the potency scale designations for the single concept *Russian*. As the table shows, there was no significance obtained in this test.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>11.85</td>
<td>5.92</td>
<td>1.43</td>
<td>.2389 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>1.32</td>
<td>.66</td>
<td>.16</td>
<td>.8523 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>13.38</td>
<td>3.34</td>
<td>.81</td>
<td>.5219 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>875.82</td>
<td>4.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>902.37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Tests of Single Concept-Evaluative Scores

The study ran a fourth series of tests using the evaluative scale designations. Here the study compared all subjects on a concept-by-concept basis utilizing only the evaluative scale designations of each concept. The results of each test appear below.

a. Evaluative-Sword score test

In contrast to the results obtained with the potency-sword test, Table XI shows that there was no significance of any kind obtained from the evaluative-sword test. On the basis of the computed probabilities, the study accepts the null hypothesis that there was no difference between groups.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>214.55</td>
<td>107.27</td>
<td>1.26</td>
<td>.2824 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>45.11</td>
<td>22.55</td>
<td>.26</td>
<td>.7697 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>160.95</td>
<td>40.23</td>
<td>.47</td>
<td>.7560 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>17,913.35</td>
<td>84.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>18,333.96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
b. **Evaluative-Symphony score test**

Table XII presents the tests of the data based on the evaluative scale designations for the single concept *Symphony*.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>778.46</td>
<td>389.23</td>
<td>5.12</td>
<td>.0069 (S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>539.40</td>
<td>269.70</td>
<td>3.55</td>
<td>.0295 (S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>546.63</td>
<td>136.66</td>
<td>1.79</td>
<td>.1290 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>16,100.89</td>
<td>75.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>17,965.38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The data in Table XII suggest that there was a significant difference in the meaning given a communicated message by subjects receiving dissimilar inducements. Furthermore, the data suggest that there was a significant difference in the meaning given a communicated message by subjects with different communication skill levels. Finally, the data suggest that there was no significant interaction between the independent variables.

To have statistical significance attributed to both independent variables (types of inducement and communication skill levels) means that both main effects contributed to the differences between groups. That is, part of the differences in the scores is explained by the kind of inducements received
by the subjects, and part of the differences in the scores is explained by
the communication skill levels of the subjects. Graph 3 shows visually the
nature of these relationships by graphing the means of the evaluative-
symphony scores of each test group.

Graph 3 shows that the general drift of all scores in each inducement
group is upward, with the negative group having the lowest scores overall.
This increase in scores constitutes a difference between inducement groups
that is greater than could be expected on the basis of random variation.
Graph 3 also demonstrates what happens within the verbal skill groups. For example, the low skill scores are, with one exception, higher than the scores in any other skill level group. The high skill scores are all very similar. The medium skill score is highest in the neutral group, while the difference between the medium skill scores of the negative and positive groups is nominal.

c. **Evaluative-Cop score test**

Table XIII presents the tests of the data based on the evaluative scale designations for the single concept *Cop*. The data in this table suggest that there was a significant difference in the meaning given a communicated message by subjects receiving dissimilar emotional inducements. However, there was no significant difference between groups with varying communication skills, nor was there any evidence of significant interaction. Table XIII differs dramatically from Table VIII. In the latter, the study ran

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>1,061.68</td>
<td>530.84</td>
<td>4.16</td>
<td>.0165 (S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>60.23</td>
<td>30.11</td>
<td>.23</td>
<td>.7926 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>253.06</td>
<td>63.26</td>
<td>.49</td>
<td>.7413 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>27,008.12</td>
<td>127.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>28,383.09</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
tests on the potency-cop scores and obtained no significance. Based on evaluative-cop scores, the study did obtain statistical significance.

d. Evaluative-Patriot score test

In Table XIV the study presents the results of the tests run on the evaluative scale designations for the single concept Patriot. The table shows that there were no statistically significant differences between groups. Therefore, the study accepts the null hypothesis of no difference between groups.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>216.55</td>
<td>108.27</td>
<td>1.36</td>
<td>.2557 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>403.27</td>
<td>201.63</td>
<td>2.54</td>
<td>.0787 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>136.12</td>
<td>34.03</td>
<td>.42</td>
<td>.7892 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>16,781.57</td>
<td>79.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>17,537.51</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

e. Evaluative-Russian score test

The results of the final test run on the data appear below in Table XV. This table presents the tests run on the evaluative scale designations for
the single concept Russian. As in the previous test, there was no statistically significant difference between groups.

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inducements</td>
<td>2</td>
<td>36.37</td>
<td>18.18</td>
<td>.17</td>
<td>.8389 (N.S.)</td>
</tr>
<tr>
<td>Verbal Skills</td>
<td>2</td>
<td>26.55</td>
<td>13.27</td>
<td>.12</td>
<td>.8787 (N.S.)</td>
</tr>
<tr>
<td>Interaction</td>
<td>4</td>
<td>256.42</td>
<td>64.10</td>
<td>.62</td>
<td>.6485 (N.S.)</td>
</tr>
<tr>
<td>Error</td>
<td>212</td>
<td>21,744.48</td>
<td>102.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>220</td>
<td>22,063.82</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the discussion that follows, the findings are summarized and interpreted in terms of the extent to which they provide support for the hypotheses appearing in Section I of the study.

D. Summary and Interpretation of the Findings

The theoretical assertion forming the basis of this study was the belief found in the literature that the emotional state of the mind at the moment a message is received helps to determine the meaning the mind gives the message. The study translated this assertion into the general hypothesis that subjects receiving dissimilar emotional inducements would give different meanings to
selected messages. In addition, the study hypothesized that subjects with different communication skill levels would give different meanings to selected messages. Finally, the study hypothesized that there might be an interaction effect between the two independent variables (types of inducement and communication skill levels). The study tested these relationships by conducting analysis of variance tests of twelve distinct dependent variable measures derived from a Semantic Differential.

In the following discussion the text first explores the isolated instances of statistical significance that lend support to the hypotheses of interaction and communication skill level effects. Then the discussion turns to the evidence in support of the hypothesis of the inducement effects. Finally, the discussion centers on some general trends in the data which, though not tested for statistical significance, are suggestive of the effects obtained in the study.

1. Evidence of Significant Interaction

Table XVI below shows that the study generated limited support for the hypothesized interaction effect. A significant interaction effect was detected on the analysis of variance test run on the potency-sword scores (Item #2, Table XVI). This was the only incidence of significant interaction found in the study. Within the limited framework of this one test there was support for the belief that both the emotional states of mind and communication skill levels of the subjects accounted for the differences between groups.

It should be noted, however, that the study obtained a significant interaction effect on only one concept, sword, and, at that, only when
this concept was rated on potency scales. This finding raised two difficult questions: (1) Why did none of the other tests yield significant interaction? (2) Why was this the only test to do so?

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Type of Test</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inducements</td>
<td></td>
</tr>
<tr>
<td>1. Evaluative Mean Score</td>
<td>Verbal Skills</td>
<td>.2491</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>.2823</td>
</tr>
<tr>
<td></td>
<td>Inducements</td>
<td>.5011</td>
</tr>
<tr>
<td>2. Potency-Sword Score</td>
<td>Verbal Skills</td>
<td>.5250</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>.0207 (S.)</td>
</tr>
<tr>
<td></td>
<td>Inducements</td>
<td>.0463 (S.)</td>
</tr>
<tr>
<td>3. Potency-Patriot Score</td>
<td>Verbal Skills</td>
<td>.6856</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>.1428</td>
</tr>
<tr>
<td></td>
<td>Inducements</td>
<td>.0069 (S.)</td>
</tr>
<tr>
<td>4. Evaluative-Symphony Score</td>
<td>Verbal Skills</td>
<td>.0295 (S.)</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>.1290</td>
</tr>
<tr>
<td></td>
<td>Inducements</td>
<td>.0165 (S.)</td>
</tr>
<tr>
<td>5. Evaluative-Cop Score</td>
<td>Verbal Skills</td>
<td>.7926</td>
</tr>
<tr>
<td></td>
<td>Interaction</td>
<td>.7413</td>
</tr>
</tbody>
</table>
There may have been two reasons why significant interactions did not appear in the other tests. The most obvious is that there simply was none. It is equally plausible, however, that there was such interaction but that its presence was too slight to be detected. Whatever the explanation, the study must accept the fact that within the limits imposed by the power of the F-test in analysis of variance, significant interaction effects did not emerge in the tests conducted on the other four concepts.

What, then, accounted for the significant interaction effect obtained in the test of the potency-sword scores? Similarly, why was this the only concept to obtain such significance? One explanation, which is admittedly speculative, hinges on the nature of the concept itself. Of the five concepts comprising the Semantic Differential, Sword was the only one that described a thing, a tangible item, a non-human element. Thus, the word Sword, viewed in terms of abstraction, was much more concrete than the other concepts used in the study. It is conceivable that because of these characteristics the word Sword carried much less connotative meaning than words like Symphony, Patriot, Cop, or Russian. If such was the case, then the denotative properties of the word Sword may have fostered the tendency for the ratings to occur as they did.

While it is risky to draw inference beyond what the data support, within the context of the five concepts used in this study there is some justification for concluding that the nature of the message itself impinges on the relationship between the independent variables. The word Sword was rated on the same scales as all other concepts. It was rated by the same subjects in the same manner. There was nothing in the conduct of the investigation that tended to single out the one concept Sword. Yet Sword
was the only concept that yielded data suggesting that emotional states of mind operate in different ways at different communication skill levels.

From a broader view, however, the study obtained a statistically significant interaction effect in only one out of twelve tests. This fact alone raises the spectre of error. In the potency-sword test the study rejected the null hypothesis of no difference between groups. The probability that the study, in fact, committed a Type I error was .0207. In other words, error may have been the causative factor.

2. Support of the Communication Skill Level Hypotheses

Table XVI shows that the only significant difference between groups attributable to differences in communication skill levels occurred in the test of the evaluative-symphony scores (Item #4, Table XVI). While this one test yielded some support for the belief that communication skill levels affect the meaning given a message, it raised the same question as the previously cited test. Why was this the only test to obtain such results?

One explanation may be error. In this one test the study rejected the null hypothesis of no differences between groups and accepted the alternate hypothesis. The risk of committing a Type I error (rejecting the null when it is true) was .0295. While this probability is well below the .05 confidence level established for the study as a whole, it is still conceivable that the results obtained arose from chance or instability of the data (see pp. 31-32).

On the other hand, if error was not the causative factor, then what accounted for the fact that Symphony was the only concept to yield
significant differences in meaning from subjects with differing communication skill levels? Phrased in different terms, why did different communication skill levels produce different interpretations of the word *Symphony* and not other words like *Patriot*, *Cop*, *Sword*, or *Russian*? The study can offer no reasonable explanation.

3. **Results of the Concept Russian**

Table XVI highlights another aspect of the findings that merits comment. The concept *Russian* was the only one that remained unaffected by either the emotional inducements or communication skill levels throughout all twelve tests, whether tested on the basis of potency scale designations or evaluative scale designations. In short, the concept *Russian* failed to produce any significance.

This outcome suggests that the concept *Russian* had for the test subjects a meaning held so rigidly that it neutralized the impact of the emotional inducements. Likewise, the concept *Russian* had for the test subjects a meaning that was relatively stable across all communication skill level groups. While the study can offer no explanation as to why the concept *Russian* failed to achieve any significance, it can at least speculate on the possibility that certain words function in unique ways relative to emotions and communication skill levels.

4. **Support of the Emotional Inducements Hypotheses**

In contrast with the aforementioned isolated instances of statistical significance, the study obtained much stronger support for the general hypothesis that the emotional state of mind affects the meaning given a
message. As Table XVI shows, the study obtained statistically significant differences between groups receiving dissimilar emotional inducements in four out of twelve tests conducted.

The first of these was the analysis of variance test based on the evaluative-mean scores. Here the study achieved a Type I error probability of .0052. In general terms this means that the emotional inducements were sufficiently intense to shift the subjects into three distinct populations.

The second instance of support for the dissimilar inducements hypothesis emerged in the tests run on the potency-patriot scores. While this test did not yield a probability level as low as in the preceding example, the result was nevertheless significant at the .05 level.

The third instance of support for the hypothesis came from the tests run on the evaluative-symphony data. The probability of a Type I error in this test was .0069, well below the .05 confidence level established for the study.

The final support for the dissimilar inducements hypothesis came from the evaluative-cop scores, which achieved a .0165 probability.

Thus, in four out of twelve tests the study developed support for the hypothesis that dissimilar emotional inducements would lead to significant differences in meaning. The central question, of course, is whether significance in four out of twelve tests is sufficient to support generalizations to a larger population or to different settings. In one respect, there may be such justification. Each of the aforementioned tests constituted, in actuality, a distinct experiment since each test used a distinct measure of the dependent variable. Viewed in this light, and considering the error inherent in most behavioral research, obtaining statistical
significance in four out of twelve experiments denotes a rather remarkable degree of consistency.

On the other hand, each of the aforementioned tests constitutes a measure of the impact of emotions on meaning in a very restricted sense. The study used only five one-word concepts and this was an extremely limited basis from which to generalize—all the more so since the study did not get consistent results across all five concepts.

The study did, however, achieve four instances of significant differences between groups arising from dissimilar emotional inducements. The study also detected one instance of significant differences between groups arising from differences in communication skill levels. Finally, the study noted one case of significant interaction in which the impact of the emotional inducements varied from one communication skill level to another. The implications of these findings form the basis of discussion of the next section of the text.
IV. IMPLICATIONS OF THE STUDY

From the outset of the experimental undertaking described herein, it was clear that this study qualified as pure research in that it neither sought nor expected to find any immediately applicable conclusions. What the study sought to do was test the efficacy of a contemporary theoretical assertion which held that emotions are part of the meaning given to perceptions of reality. From the experimental configuration designed to translate this assertion into testable hypotheses, the study generated several statistically significant findings. These findings, in turn, have implications (1) for the theoretical assertion on which the study was based, (2) for future research concerning the role of emotions in meaning, and (3) for more effectiveness in everyday interpersonal communication.

A. Implications for the Theoretical Assertion on Which the Study Was Based

To the extent that the findings of this study form a legitimate basis from which to generalize, the most obvious implication of the findings is that the theoretical assertion, in its present form, is stated in terms too general to adequately describe the role of emotions in the filtering process of the mind. The assertion holds that the emotional state of the mind at the moment a message is received helps to determine the meaning the mind gives the message. To a limited degree, the study supported this assertion. The emotional states of mind stemming from the emotional inducements did affect the meanings the subjects gave the communicated messages.
But they did more than this. They also yielded results which the theoretical assertion neither explained nor predicted.

For example, the findings suggest rather strongly that emotions differ in their capacity to influence meaning. One of the principal reasons the study used two experimental groups (the positively and negatively induced groups) was to see if different emotional states of mind would have different effects on meaning. Apparently they did. The scale designations of the positively induced groups were consistently higher than those of the neutrally induced groups. Conversely, the scale designations of the negatively induced groups were consistently lower than those of the neutrally induced groups. In other words, the positive inducements produced more positive ratings, while the negative inducements produced more negative ratings.

The fact that the inducements produced dissimilar response patterns suggests the need for modification in the theoretical assertion. Formerly, the assertion held that the emotional state of the mind would affect the meaning given a communicated message. Based on the findings of this study, however, a more precise articulation of the assertion would be as follows:

A communicated message will be interpreted differently by those emotionally aroused
and those not aroused,

and

A communicated message will be interpreted differently by those with dissimilar emotional arousals.
The findings also suggest that the influence of some emotions is greater than that of others. The study found that the magnitude of differences in scale designations between the negatively and neutrally induced subjects was greater than the magnitude of differences in scale designations between the neutrally and positively induced groups. In other words, there was a greater difference between the negative and neutral groups than there was between the neutral and positive groups (see Graphs 1, 2, and 3). To the extent that differences in scale designations between the neutral group and others can be interpreted as a measure of the distortion caused by the inducements, the negative inducement clearly had the greater impact.

This, in turn, suggests a further amendment in the theoretical assertion. Based on the findings of this study, the theoretical assertion would be more precisely articulated if it read as follows:

A communicated message will be interpreted differently by those emotionally aroused and not aroused,

and

A communicated message will be interpreted differently by those with dissimilar emotional arousals,

and

A communicated message will be interpreted with greater variation in meaning by those negatively aroused than by those positively aroused.
A final implication for the theoretical assertion stems from the fact that the study produced statistically significant differences in meaning with only four of the five concepts used. One of the concepts was unaffected by the emotional inducements. This inconsistency suggests that the meanings of some messages are not susceptible to the influence of emotions. The meanings of such messages may be held so strongly that they neutralize the impact of the emotions. Whatever the case, the findings warrant still another qualification for the aforementioned theoretical assertion.

Thus, based on the findings of this study, the theoretical assertion that emotion affects meaning would be more precisely articulated if it read as follows:

A communicated message will be interpreted differently by those emotionally aroused and those not aroused,

and

A communicated message will be interpreted differently by those with dissimilar emotional arousals,

and

A communicated message will be interpreted with greater variation in meaning by those negatively aroused than by those positively aroused,

but

The impact of an emotional arousal on the interpretation of a communicated message may be neutralized by the nature of the message itself.
These, then, are the implications of the findings for the theoretical assertion on which the study was based. As reformulations of the original assertion they are legitimate only to the extent that such inferences can be drawn from the limited framework of an experiment. Nonetheless, they are warranted since, on the basis of experimental research rather than personal introspection or unsystematic observation, the study generated statistically significant findings. Emotion, apparently, is a viable within-receiver characteristic the presence of which impinges meaningfully on the communication process.

B. Implications for Future Research

The findings of the study hold numerous implications for future research on the role of emotion in the filtering process. The findings show, for example, that emotional arousals do not consistently produce differences in meaning. Future studies might well explore the impact of emotional arousals on concepts other than the ones used in this study. Such research across many concepts might well yield discernible clusters of one-word concepts that consistently remain unaffected by the emotional arousals. These clusters could then be analyzed to see if they share some common characteristic which inhibits the effect of the emotional arousal.

Future studies might profitably explore the effects of emotional arousals on whole sentences rather than one-word concepts. It is quite conceivable that the effect of an emotional arousal on the meaning of a single word might well be dissipated when the word appears in the
contextual setting of a sentence. Sentences, in turn, might prove more or less susceptible to emotional arousals than entire paragraphs. By extending the research into more complex and meaningful message levels, future research could more realistically approximate actual communication practices.

The finding of only one significant interaction effect has implications for future research. Emotional arousals, apparently, do not often act in concert with communication skill levels to force differences in meaning. In the present study the concept Sword was the only one to yield significant interaction. It was also the least abstract of the concepts used. Future studies might well replicate the present one using concepts with marked differences in abstraction levels. For example, words like Hammer, Leaf, Floor, and Glass could be tested in conjunction with words like Democracy, Pride, Transcendental, and Wealth. Differences in meaning attributable to emotional arousals could then be compared with the abstraction levels of the concepts to see if discernible patterns were forthcoming.

The finding of only one instance of difference in meaning attributable to differences in communication skill levels has implications for future research. Apparently, the communication skill levels of the subjects had little relevance. Other within-receiver characteristics such as the subjects' socio-economic background, values, beliefs, religion, attitudes, knowledge level, or expectations might produce quite dissimilar results. In spite of the findings obtained in this study, it still seems reasonable to assume that other within-receiver characteristics impinge meaningfully on the filtering process. Furthermore, these other within-receiver characteristics might very well yield indications of interaction with the emotional inducements.
The study also has implications for cross-cultural research. Simultaneous research conducted in different countries might well indicate the degree to which emotions constitute relevant variables in the communication processes of subjects with different languages and cultures. Depending upon the behavioral norms of the parent country, the results might be strikingly different. For example, would the role of emotions be more or less dramatic among users of the Romance languages or the Germanic languages?

Another facet of the study in need of research hinges on the mechanisms used to induce the emotional arousals. The study used a positive and negative inducement only. It made no attempt to explore the consequences of various levels of inducement. Would the consequences be the same for a low intensity inducement as for a high intensity inducement? The study could well be replicated using not a positive or negative inducement, but a series of negative inducements pitched at different levels of intensity. The same could be done using positive inducements of various levels. A study done in this fashion could greatly amplify and clarify the role of emotions in the process of giving meaning to incoming stimuli.

Closely related to the former is the obvious need to broaden the base of the experimental treatments. While the positive-negative approach was a convenient dichotomy for operationalizing the inducements, it was hardly exhaustive. Emotions, at least from a descriptive point of view, exist in many forms that conventionally imply characteristic behaviors. Anger, for example, implies behavior that is quite different from the behavior associated with joy. Elation denotes behavior quite unlike that found with fear. To the extent that these descriptive labels of emotion could
be translated into specific inducements designed to evoke the characteristic behaviors associated with them, future studies could develop much more exacting explorations of the role of emotions.

Future studies might well explore in greater depth the specific effects of emotion on meaning. The present study found limited support for the contention that emotion affects meaning. But what is the nature of the effect? Do emotions merely cause meanings to vary? Do emotions cause distortions in meaning? Is the accuracy with which one interprets a message affected by the emotions? Could there conceivably be a relationship between the accuracy of interpretation and the kind of emotion one experiences? All of these questions go beyond the scope of the present study, but they do constitute logical extensions of the findings of the present study.

Another implication for future research stems from the measurement of meaning used in the study. The Semantic Differential technique is limited in that it measures, for the most part, the connotative elements of words or phrases. There are numerous kinds of meaning, however, each of which might be affected in unique ways by emotion. Specific meaning, the basic symbol-object relationship, may not be affected by emotion in the same way as import, the grasping of an idea. Similarly, "implication" as a form of meaning might be more strongly affected by emotion than "significance" as a form of meaning. In short, as the levels of meaning themselves become more and more abstract, the impact of emotion might rise or fall. Unfortunately for this line of research, there is little available today in the way of validated instruments that would permit such inquiries.
Other implications for future research stem from the sample used in the present study. The use of college students, while convenient, nevertheless constitutes a limited sample in that the results obtained are not necessarily indicative of those to be found in other populations or settings. Future studies might well explore the effects of emotion on meaning using a variety of subjects. Professional people could be compared with blue-collar workers. Dissimilar occupational groups could be compared. Male and female subjects or young and old subjects could be compared.

Closely related to the foregoing is the need for future research in different settings. While the classroom constitutes a natural and accessible laboratory, it seems reasonable to assume that it has its own unique set of behavioral norms. These norms may very well impinge upon the subject's susceptibility to the emotional inducements and, thus, his subsequent behavior. Research in other settings with different behavioral norms might yield results quite unlike the ones obtained in this study. Furthermore, to the extent that such difference actually occurred, the researcher would be in a far better position to assess the situational factors which themselves retard or encourage emotional behavior.

Perhaps the most important implication for future research stems from the fact that the study broke new ground in experimentally validating the role of emotion in meaning. The scope of the study was, admittedly, narrow; but it was a starting point. And, since the study did obtain statistically significant findings, there is reason to believe that future research can successfully build on this base.
C. Implications for More Effective Interpersonal Communication

The ultimate goal of a study of this kind is to learn more about the process of human communication. To the extent that research can isolate and study those variables which influence the receiver's responses in a communication event, such research leads to greater effectiveness in human communication.

The present study found that emotion is a significant within-receiver characteristic capable of influencing the meaning a respondent gives an incoming message. While the finding is far too narrow to permit reliable prediction, it is sufficient to have implications for more effective interpersonal communication.

One implication of the findings concerns the message sender. To the extent that the message sender can detect an emotional arousal in the receiver, the sender has some reason to believe that the message may suffer distortions or alterations in meaning. Based on the findings of this study, it seems likely that the inherent lack of congruity in meaning between sender and receiver may very well be intensified by the emotional arousal of the receiver. If such is the case, the sender would do well to postpone his message until the emotional arousal in the receiver has run its course.

The findings also have implications for those communicative settings that are likely to foster strong emotional reactions. In a superior-subordinate relationship, for example, emotions are likely to be heightened by marked differences in rank, power, and status. If so, managers would profit by considering carefully the intrusions that emotions can make on meaningful, effective dialogue. Perhaps a greater reliance on feedback would lessen the impact of the emotional distortions.
Clearly, the findings have implications for those events that transpire in an emotionally charged atmosphere. A periodic evaluation of a subordinate may be a case in point. The subordinate enters the situation knowing that his future promotions and pay increases may well hang in the balance. If he knows his work has been outstanding, he may have high expectations. If he knows his work has been poor, he may be apprehensive and already positioned in a defensive posture. Whatever the case, his superior must communicate with him effectively. If the superior is aware of the disruptive effects the subordinate's emotions can have, the superior will attempt to alleviate these by putting the subordinate at ease, by establishing a rapport with him, and by striving for a climate that is less emotionally charged.

In short, the findings of the study have implications for almost every instance of human interaction in which meaning is transferred symbolically. The findings suggest rather strongly that emotion is a significant within-receiver characteristic, one that impinges meaningfully on the communication process. But this is only the beginning. It will be up to future research to delve deeper into the phenomenon of emotion, to generate new theories with greater predictive powers, and to recommend techniques and communication practices that will assuage the disruptive effects that emotions apparently have.
BIBLIOGRAPHY

Books


**Periodicals**


**Unpublished Doctoral Dissertations**


**Miscellaneous Publications**


APPENDIX A

APPROVAL OF THE STUDY BY THE COMMITTEE ON USE OF HUMANS AND ANIMALS AS RESEARCH SUBJECTS
from: Dr. R. B. Lank, Chairman  
Committee on Use of Humans & Animals  
as Research Subjects  
to: C. Donald Porterfield  
Department of Management  

July 10, 1973

The dissertation proposal entitled "A Study to Determine the Effects of Dissimilar Emotional Arousals and Communication Skills on the Meanings Given Communicated Messages" has been reviewed.

It is recognized a significant part of the proposal will be completed at locations other than LSU-BR. These planned activities, if they were to be scheduled on the Baton Rouge Campus, would comply with the accepted principles relative to safeguarding the rights and welfare of humans as research subjects. The Chairman of the Committee has given tentative approval pending a review by the entire Committee at its next meeting.

R. B. Lank, Chairman  
Committee on Use of Humans and Animals as Research Subjects

Copy:  
Dr. R. B. Lesikar
APPENDIX B

THE COVER STORY USED IN THE STUDY
AT FIRST ENTRY INTO THE TEST SITES
I'm from the Department of Management, Louisiana State University (or The University of Texas at San Antonio), and I'm here to ask if you would participate in a survey conducted under the auspices of the American Business Communication Association.

The American Business Communication Association is an organization that acts in an advisory capacity to faculty members who teach business communication courses. The Association feels it could better advise faculty members if it knew more about students who take business communication courses.

Therefore, the Association is conducting a national survey to measure the caliber of communication skills of business students, and I've been asked to conduct the survey in Louisiana (or Texas).

You don't have to participate. It's voluntary. You'll remain completely anonymous. Will you participate?

You'll notice when I pass out the papers that there is a short questionnaire attached. This questionnaire is included merely to satisfy sampling requirements. The only identification called for is your student number.

The reason I'm asking for your student number is so I can pair up your two survey instruments. You see, this test is the first of two I'd like you to take. I'm only giving one of them today so that I don't take up too much class time. I'll be back again in a week or so with the second survey. Again I'll ask that you identify yourself by student number only.

Will you participate?
APPENDIX C

QUESTIONNAIRE TO DETERMINE SAMPLE CHARACTERISTICS

AND

THE EMPLOYEE APTITUDE SURVEY—TEST 1, VERBAL COMPREHENSION,
WITH INSTRUCTIONS
QUESTIONNAIRE TO DETERMINE SAMPLE CHARACTERISTICS

Student number_________________________

What is your age?_______________________

Are you a United States citizen?          Yes_______ No_______

Were you born in the United States?      Yes_______ No_______

What is your sex?                        Male_______ Female_______

What is your education level?

Freshman______ Sophomore______ Junior______ Senior______

Is English your native tongue?           Yes_______ No_______

Are you bilingual?                       Yes_______ No_______

Please mark each language that you speak fluently:

English______ French______ Spanish______ German______

Russian______ Italian______ Oriental language__________
PLEASE NOTE:


UNIVERSITY MICROFILMS.
APPENDIX D

INSTRUCTIONS FOR IMPLEMENTING
THE EMOTIONAL INDUCEMENTS
INSTRUCTIONS FOR IMPLEMENTING THE POSITIVE, NEUTRAL, OR NEGATIVE INDUCEMENT

Presented below are the instructions for each of the three inducements to be used in the present study. You will be asked to use only one of the three and you will be notified in advance which inducement to use in your classroom. It should be obvious that a vitally important requisite of the study is for all instructors using the same inducements to do so in a similar fashion. In short, similarity of presentation is crucial. To this end, you are asked to carry out the instructions explicitly. Please do neither more nor less than is called for.

The Negative Inducement

Objective. The negative inducement is designed to arouse a generally unpleasant emotional state of mind in the students. The actual emotion evoked by the inducement, be it anger, resentment, rage, fury, or irritation, is of little consequence to the study. What is important is that the students be aroused to a level of emotional intensity higher than normal for the classroom where an exam is being returned.

Instructions. Here are the step-by-step instructions for implementing the negative inducement on the appointed day. Please execute the instructions in the exact sequence in which they appear.

1. Walk into the classroom with the exams displayed where the students can see them.

   Please time your entry so that you arrive just as the bell rings. Most students will be in their seats by then and you can commence without having to counter too many inquiries about exam results. If you have any questions please be evasive in your answers.
2. Announce to your class that you are going to (1) put the grade distribution on the blackboard, (2) continue with your lecture where you left off last time, and (3) return the exams at the end of the class period.

You may use your own wording but please mention all three statements in the order they appear above. Simply adopt a "matter-of-fact" tone as if you were giving the usual agenda for the day.

3. With some wording like, "Here is the grade distribution from your exam," turn and put the following array on the blackboard.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Students</th>
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<tr>
<td>100</td>
<td>(16% of your students)</td>
</tr>
<tr>
<td>90 - 97</td>
<td>(24% of your students)</td>
</tr>
<tr>
<td>80 - 89</td>
<td>(46% of your students)</td>
</tr>
<tr>
<td>78 - 79</td>
<td>(14% of your students)</td>
</tr>
</tbody>
</table>

The students should be quick to perceive that the grades are quite high and distributed over a range of 78-100. (To get the number of students in each grade interval simply multiply your total number of students by the indicated percentage and round off accordingly. If your exams are based on other than 100 points simply adjust the scale.)

4. Turn back to your class and announce, "The grades are too high so I'm going to attach a 10-point negative curve." Justify this announcement with the following comments.

(a) "I think the exam was too easy."
(b) "I think every exam should produce some A's, B's, C's, D's, etc."
(c) "It is fair to curve grades down because if they had been too low you would have insisted that I curve them up."

Again, adopt a "matter-of-fact" tone as you make these statements. Though you may use your own wording, don't take on an apologetic tone. Your comments should imply that you will not bargain and that your decision is final.
5. Having made the previous announcements, turn back to the blackboard and put up the following distribution indicating the results of the downward curve.

- 90 = ........................ (16% of your students)
- 80 - 87 = ........................ (24% of your students)
- 70 - 79 = ........................ (46% of your students)
- 68 - 69 = ........................ (14% of your students)

If you wish you may again mention the justifications used above, but, in any case, do not permit the students to draw you into a debate or to challenge or question your actions.

6. Commence your lecture where you left off at the previous period.

The objective here is to get off the negative inducement quickly. It should take about five to seven minutes to implement the inducement and about twelve minutes at the end of the period for the follow-up test. The intervening time for your lecture can thus be approximated.

7. About twelve minutes before the class period ends the investigator enters to conduct the follow-up test. Following the test, full disclosures are made.

The Positive Inducement

Objective. The positive inducement is designed to arouse a generally pleasant emotional state of mind in the students. The actual emotion evoked by the inducement, be it joy, happiness, delight, or euphoria, is of little consequence to the study. What is important is that the students be aroused to a level of emotional intensity higher than normal for the classroom where an exam is being returned.
Instructions. Here are the step-by-step instructions for implementing the positive inducement on the appointed day. Please execute the instructions in the exact sequence in which they appear.

1. Walk into the classroom with the exams displayed where the students can see them.

   Please time your entry so that you arrive just as the bell rings. Most students will be in their seats by then and you can commence without having to counter too many inquiries about exam results. If you have any questions please be evasive in your answers.

2. Announce to your class that you are going to (1) put the grade distribution on the blackboard, (2) continue with your lecture where you left off last time, and (3) return the exams at the end of the class period.

   You may use your own wording but please mention all three statements in the order they appear above. Simply adopt a "matter-of-fact" tone as if you were giving the usual agenda for the day.

3. With some wording like, "here is the grade distribution from your exam," turn and put the following array on the blackboard.

   80 - 82 = ..................... (16% of your students)
   70 - 79 = ..................... (24% of your students)
   60 - 69 = ..................... (46% of your students)
   55 - 59 = ..................... (14% of your students)

   The students should be quick to perceive that the grades are quite low and distributed over a range of 55-82. (To get the number of students in each grade interval simply multiply your total number of students by the indicated percentage and round off accordingly. If your exams are based on other than 100 points simply adjust the scale.)
4. Turn back to your class and announce, "The grades are too low so I'm going to attach a 10-point positive curve." Justify this announcement with the following comments.

(a) "I think the exam was too hard."
(b) "I think every exam should produce some A's, B's, and C's, as well as D's and F's."
(c) "It is fair to curve grades up because the best work ought to receive an A."

Again you may use your own wording, but try to adopt a "matter-of-fact" tone as you make these statements. You needn't embellish the comments nor make them sound as if you are trying to curry favor.

5. Having made the previous announcements, turn back to the blackboard and put up the following distribution indicating the results of the upward curve.

90 - 92 = ..................... (16% of your students)
80 - 89 = ..................... (24% of your students)
70 - 79 = ..................... (46% of your students)
65 - 69 = ..................... (14% of your students)

If you wish you may again mention the justifications used above, but don't dwell on them.

6. Commence your lecture where you left off at the previous period.

The objective here is to get off the positive inducement quickly. It should take about five to seven minutes to implement the inducement and about twelve minutes at the end of the period for the follow-up test. The intervening time for your lecture can thus be approximated.

7. About twelve minutes before the class period ends the investigator enters to conduct the follow-up test. Following the test, he makes full disclosure.
The Neutral Inducement

**Objective.** In this test group there is no inducement. Rather, these are the students that will act as control groups in the study. What is important here is for the instructor to follow the same sequence of events as the experimental groups. Beyond this, the instructor should do nothing to arouse the emotions of his students above the normal level to be expected in the classroom when exams are being returned.

**Instructions.** Here are step-by-step instructions for returning the exams to the control group on the appointed day. Please execute the instructions in the exact sequence in which they appear.

1. Walk into the classroom with the exams displayed where the students can see them.

   Please time your entry so that you arrive just as the bell rings. Most students will be in their seats by then and you can commence without having to counter too many inquiries about exam results. If you have any questions please be evasive in your answers.

2. Announce to your class that you are going to (1) put the grade distribution on the blackboard, (2) continue with your lecture where you left off last time, and (3) return the exams at the end of the class period.

   You may use your own wording but please mention all three statements in the order they appear above. Simply adopt a "matter-of-fact" tone as if you were giving the usual agenda for the day.

3. With some wording like, "Here is the grade distribution from your exam," turn and put the following grade array on the blackboard.
90 - 100 = .................... (12% of your students)
80 - 89  = .................... (22% of your students)
70 - 79  = .................... (36% of your students)
60 - 69  = .................... (20% of your students)
55 - 59  = .................... (10% of your students)

The students should be quick to perceive that the grades are quite normally curved and distributed over the usual, or customary, range. (To get the number of students in each grade interval simply multiply your total number of students by the indicated percentage and round off accordingly. If your exams are based on other than 100 points simply adjust the scale.)

4. Turn back to your class and announce, "The test scores are quite normally distributed over the grade range." Then add the following points.

(a) "I think the test was at the right level of difficulty."

(b) "The exam has produced a good sprinkling of all grades—A's, B's, C's, D's, etc."

(c) "The exam indicated the level of competence of the students very well."

You may use your own wording, but keep your tone "matter-of-fact." It would be appropriate for you to indicate by word or implication that you are satisfied with the results and that the results were just about what you expected.

5. Commence your lecture where you left off at the previous period.

The objective here is to move from the grade disclosures into the lecture quickly. It should take about five to seven minutes to announce the exam results and about twelve minutes at the end of the period for the follow-up test. The intervening time for your lecture can thus be approximated.

6. About twelve minutes before the class period ends the investigator enters to conduct the follow-up test. Following the test, he makes full disclosure.
APPENDIX E

SEMANTIC DIFFERENTIAL USED IN THE STUDY
AND INSTRUCTIONS USED IN ITS IMPLEMENTATION
SWORD

<p>| Small  |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
| Weak   |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:</strong></strong>:  |
| Kind   |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
| Sweet  |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:</strong></strong>:  |
| Profane|  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
| Bad    |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:</strong></strong>:  |
| Unfair |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
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| Honest |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
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| Ugly   |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:</strong></strong>:  |
| Foul   |  <em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<em><strong><strong>:</strong></strong></em>:<strong><strong>:  |
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RUSSIAN

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| Large  |  |  |  |  |  |  |  |
| Cruel  |  |  |  |  |  |  |  |
| Sweet  |  |  |  |  |  |  |  |
| Sacred |  |  |  |  |  |  |  |
| Bad    |  |  |  |  |  |  |  |
| Fair   |  |  |  |  |  |  |  |
| Awful  |  |  |  |  |  |  |  |
| Dishonest |  |  |  |  |  |  |  |
| Clean  |  |  |  |  |  |  |  |
| Sweet  |  |  |  |  |  |  |  |
| Ugly   |  |  |  |  |  |  |  |
| Fragrant |  |  |  |  |  |  |  |
| Unpleasant |  |  |  |  |  |  |  |
| Strong |  |  |  |  |  |  |  |
INSTRUCTIONS GIVEN TO STUDENTS USING THE SEMANTIC DIFFERENTIAL

The purpose of this test is to measure the meanings of certain things to various people by having them judge them against a series of scales. You'll note that at the top of each page in the booklet there is a single word. You are to judge what this term means to you by rating it against the set of scales that appears beneath it.

Suppose, for example, we had the word "cake" with the following scale beneath it.

Hot _____:_____:_____:_____:_____:_____:_____: Cold

Now it could be that the word "cake" means to you something extremely hot or extremely cold. If so, you would mark the scale accordingly.

Hot X:_____:_____:_____:_____:_____:_____: Cold
          extremely        extremely

It could be that the word "cake" means to you something only quite hot or quite cold. If so, you would mark the scale accordingly.

Hot _____: X:_____:_____:_____:_____:_____: Cold
              quite        quite

It could be that the word "cake" means to you something only slightly hot or slightly cold. If so, you would mark the scale accordingly.

Hot _____:_____: X:_____:_____:_____:_____: Cold
              slightly     slightly
There are two possibilities left. It may be that the word "cake" means to you something that is *neither* hot nor cold. Or, it may be that the terms "hot" and "cold" are irrelevant when compared with "cake." If either case applies, then mark the scale accordingly.

| Hot | : | : | : | X | : | : | Cold |

Please place your marks in the middle of the spaces, not on the boundaries. Be sure you check every scale for each concept. Please do not omit any scales. Finally, please do not put more than one check-mark on a single scale.

You should make each item a separate and independent judgment. Work as rapidly as you can and don't worry or puzzle over individual items. It is your first impressions that are important.

Please begin.
APPENDIX F

NORMS OF THE EMPLOYEE APTITUDE SURVEY—TEST 1, VERBAL COMPREHENSION, AND ARRAY OF VERBAL COMPREHENSION SCORES OBTAINED IN THE STUDY
NORMS OF THE EMPLOYEE APTITUDE SURVEY—TEST 1, VERBAL COMPREHENSION
FOR MALE AND FEMALE COLLEGE STUDENTS*

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VITA

Charles Donald Porterfield
137 Inslee
San Antonio, Texas 78209

Born: August 1, 1941 Dallas, Texas

Marital Status: Married, one daughter

Physical Handicaps: None

Height and Weight: 5'10" 165 lbs.

Schools Attended:

1959-1962 Wichita State University, Wichita, Kansas
1962-1965 North Texas State University, Denton, Texas
1966-1968 North Texas State University, Denton, Texas
1968-1974 Louisiana State University, Baton Rouge, Louisiana

Degrees Earned:

B.A. (English and Spanish) North Texas State University, 1965
M.B.A. (Management and Economics) North Texas State University, 1968
Ph.D. (Management-Communications) Louisiana State University, 1974

Current Employment:

Assistant Professor, Division of Management,
The University of Texas at San Antonio,
San Antonio, Texas.
EXAMINATION AND THESIS REPORT

Candidate: Charles Donald Porterfield

Major Field: Management

Title of Thesis: An Experimental Study to Determine the Effects of Dissimilar Emotional Inducements and Communication Skill Levels on the Meanings Given Communicated Messages

Approved: Raymond Leach

Major Professor and Chairman

James R. Traynor

Dean of the Graduate School

EXAMINING COMMITTEE:

Herbert H. Cole

Alvin L. Bertrand

Edmond A. Gray

David W. Smith

O. Jeff Harris

Date of Examination:

July 8, 1974
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