AN INVESTIGATION OF VARYING DEGREES OF HIGH DISCREPANCY AND CHANGE IN HIGHLY INVOLVED SUBJECTS: A CONCEPT FORMATION PROBLEM

A Thesis

Presented to

the Faculty of the Graduate School

of the

University of Houston

In Partial Fulfillment

of the Requirements for the Degree of

Master of Arts

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by

Dan R. Mathis

May 1973

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ABSTRACT

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This study was designed to investigate the amount and the nature of change produced in highly involved individuals when they are confronted with extremely discrepant information. To determine the change and to allow for an examination of it in as pure a form as possible a basic information processing problem in concept formation was used. The independent variable was change in an originally formed concept.

The subjects in this study were given a two part concept formation test in which the experimenter induced involvement. By solving Part I of the test the subjects assumed a position analogous to an attitude. By solving Part II of the test the subjects were considered to have undergone a process analogous to a counter communication situation. The subjects' responses to the three levels of high discrepancy in the second part of the test were considered indicative of their change. The group change was measured and a test of difference was applied to determine the significance. No statistical difference was discovered for the three groups.

TABLE OF CONTENTS

AN INVESTIGATION OF VARYING DEGREES OF HIGH DISCREPANCY AND CHANGE IN HIGHLY INVOLVED SUBJECTS: A CONCEPT FORMATION PROBLEM

Chapter I

Introduction

The specific purpose of this thesis was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. A basic information processing problem in concept formation was used to determine this change. The independent variable or stimulus each subject received was discrepancy, while the dependent variable which appeared and varied was the change each subject exhibited from an initial position. An experiment was designed to measure the dependent variable.

The subjects were given a concept formation test in which the experimenter induced high involvement. The test consisted of two parts. In Part I the subjects were asked to solve a series of concept formation instances. By solving this part of the test the subjects assumed a position considered analogous to an attitude. Part II of the concept formation test presented a series of concept instances that were extremely discrepant from the correct answer for Part I

of the test. By responding to Part II of the test the subject was considered to have undergone a process that was analogous to a counter communication situation. The subject's answer to the second part of the test was considered indicative of his change (or attitude change). The change was measured and a test of the difference was applied to determine the significance.

Each chapter discusses a specific area of concern: Chapter I examines the significance of the concepts used in this thesis and the purpose of the thesis; Chapter II examines the problem investigated here by reviewing the pertinent research, and presenting a statement of the problem: Chapter III is a discussion of the experimental procedure; Chapter IV identifies the results; and Chapter V offers a discussion of the results and the conclusions that can be drawn from this thesis.

Importance of the Study

A thesis of this nature is important for several reasons. In the world we live in one is continually aware of the rapidity of change within it. This state of perpetual flux is the basis--ultimately--of our progress; yet, in another sense it may be the origin of our conflict. A generally accepted dictum is that the origin of this conflict is the inherent differences among individuals, and as these individuals become socialized and form groups their judgments on social issues intensify conflict. Muzafer Sherif has said

it this way:

> Today we are more keenly aware than ever before of the differing beliefs, values, ways of life, and ideologies of various human groups and societies. These differences are reflected in the attitudes of individuals belonging to the various human groups. Because the differences are frequently revealed in actual and potential conflict, problems of attitude and attitude change are among the most vital and timely in this world of rapid change.[1]

The resolution of conflict from these inherent differences is an area in which the rhetorician is useful. His task is to find the most effective means of presenting a particular communication so that the desired response is elicited from the listeners. If the purpose of the communication is accomplished and the listeners are moved to action, or convinced to accept a particular position, or persuaded to take one course of action over another, then some conflict may be eliminated. In Persuasion: Theory and Practice Kenneth E. Anderson defined this problem a bit more technically. He suggested that the persuasive aspect of communication was a "process of interpersonal communication in which the communicator seeks through the use of symbolic agencies to affect the cognitions of the receiver and thus effect a voluntary change in attitude and/or action desired by the communicator."[2]

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[1] Carolyn W. Sherif and Muzafer Sherif, eds., Attitude Ego-Involvement, and Change (New York: John Wiley and Sons, Inc., 1968), p. 1.

[2] (Boston, Mass.: Allyn and Bacon, Inc., 1971), p. 23.

Thus, it is hoped that this study can make the rhetorician's task easier by expanding his understanding of highly involved individuals when they are confronted with extremely discrepant information. Subsequently, two reasons for the importance of this study were indicated. First, the study might provide meaningful insight into the rhetorician's general problem of finding the most effective means of presenting a communication. Second, it might broaden our knowledge of the available means of resolving conflict.

Significance of the Concepts

The concepts pertinent to this study are involvement and concept formation. Involvement has evolved from social psychology while concept formation was derived from psychology.

Involvement

In general, the variable of involvement has been considered an important area of study in attitude and attitude change.[3] Productive lines of research employing involvement

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[3]Carl I. Hovland, O. J. Harvey, and Muzafer Sherif, "Assimilation and Contrast Effects in Relation to Communication and Attitude Change," Journal of Abnormal and Social Psychology, LV (1957), 244-252. Carl I. Hovland, "Reconciling Conflicting Results Derived From Experimental and Survey Studies of Attitude Change," Amer. Psychol. XIV (1959), 8-17. P. G. Zimbardo, "Involvement and Communication Discrepancy as Determinants of Opinion Conformity," Journal of Abnormal and Social Psychology, LX (1960), 86-94.

have related to attitude and opinion measurement.[4] Involvement has commonly been defined in terms of identity or strength (favorable or unfavorable) of an individual's position regarding an attitude object within a particular attitude "domain." Freedman concluded that the most common usage of involvement was to refer to "interest in, concern about, or commitment to , a particular position on an issue. . . ."[5] The present study was concerned with the strength of the subject's position concerning an attitude object within a particular attitude domain as well as his commitment to that position.

Strength of the S's position and his commitment to that position were emphasized because until now involvement was primarily investigated by studying the effects of discrepant communications in relation to an individual's stand on a particular issue (i.e. his involvement in that issue).[6] These investigations were concerned with the individual's attitude change from an initial position after he was presented with discrepant information. Likewise, this thesis

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[4]Yale Studies in Attitude and Communication, Social Judgment: Assimilation Contrast Effects in Communication and Attitude Change. eds. Muzafer Sherif and Carl Hovland, Vol. IV (New Haven: Yale University Press, 1961). Carolyn W. Sherif, Muzafer Sherif, and Roger E. Nebergall, Attitude and Attitude Change (Philadelphia: W. B. Saunders Co., 1965). Sherif and Sherif, Attitude, Ego-Involvement, and Change.

[5]Johnathan L. Freedman, "Involvement, Discrepancy, and Change," Journal of Abnormal and Social Psychology. LXIX (1964). p. 290.

[6]Ibid.

was conducted along somewhat similar lines. The subject's position was noted and his change from that position was measured after he was presented with information extremely discrepant to his initial position.

Pertinent to this thesis is an understanding of the locus of involvement. "In most research in this area involvement has been used to refer to the amount of intrinsic interest or importance a particular issue or act holds for S."[7] This use of involvement is in league with that employed by Sherif and Hovland in the focus on issue and, in particular, in the concern with the subject's stand on that issue.[8] Zimbardo suggested a use for involvement other than issue-involvement. He offered response-involvement as a plausible manner in which to work with the variable. Response-involvement is focused on the individual's concern with the consequences of his actions and thoughts.[9] Freedman offered this example of response-involvement:

> A situation in which an individual knows that a response he has made or an opinion he has expressed will lead to reward or punishment will be expected to produce response-involvement. If an individual is told that a reward depends on how correct his response is, he becomes involved in his response.[10]

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[7]Johnathan L. Freedman, "The Effect of Involvement on Consistency and Change," unpublished dissertation. Yale University. 1962. p. 2.

[8] Yale Studies in Attitude and Communication. Vol LV.

[9]Zimbardo.

[10]Freedman, dissertation. p. 3. italics added.

This use of involvement (response-involvement) is pertinent to this study in that involvement in the concept formation task is induced through the individual's concern with the consequences of his response.

Concept Formation

In addition to involvement, concept formation is considered a significant area in attitude and attitude change.[11] Concept formation, or concept learning "is an important part of the organization of knowledge."[12] Specifically, it is derived from psychology, but its application is broad, Hunt pointed out that concept formation is not to be treated "solely as a topic in logic, a type of behavior to be derived from psychological theory, or a possible area of application for electronic computers."[13] Concept formation is, in effect, a construct that is inherently fundamental to understanding man's ability to classify or categorize his knowledge.

To say that man classifies or categorizes his knowledge presupposes that those things that he classifies or categorizes are his observations. From his observations he makes abstractions through which he relates objects, events, and persons to the real world. The psychologist, by studying

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[11] R. J. Rhine, "A Concept-Formation Approach to attitude Acquisition," Psychological Review. LXV (1958), 362-370.

[12] Earl B. Hunt, Concept Learning (New York: John Wiley and Sons, 1966), p. vii.

[13] Ibid.

concept formation, and the rhetorician, by studying attitude and attitude change, seek to understand the abstracting process. Through investigation of the abstracting process the psychologist hopes for knowledge of the formation of concepts, while the rhetorician's desire is to gain information about the formation and alteration of attitudes. Consequently, "Experimental studies of concept formation are generally designed to produce situations in which information processing or concept abstracting can be derived in as pure a form as possible."[14]

Investigations of concept formation have dealt with aspects of the topic such as length of lists, ratio of positive to negative instances, ratio of relevant to irrelevant dimensions, and type of concept.[15] These investigations, however, have produced "a gap between experimentally studied concept formation on the one hand and actual concept formation and other cognitive processes on the other."[16]

In a pioneering study by Jonathan L. Freedman an attempt was made to "bridge this gap." His objective was to bring concept formation and the cognitive processes of attitude and attitude change together. Freedman offered an explicit explanation of this in the introduction to his disser-

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[14]Freedman, dissertation. p. 2.
[15]Ibid., p. 1. [16]Ibid.

tation:

> When an individual forms a concept on the basis of some information and is then exposed to additional information, the degree of involvement in the first concept is probably a very important determinant of his response to the new information. The scientist who decides whether or not some new data is consistent with his theory is usually deeply involved with his own theory. He does not process and evaluate the new data in the same way that he would if he did not already have a theory. His prior involvement would probably have a profound effect on his response to the new information which was seemingly inconsistent with the existing theory.[17]

In the second volume of the Yale Studies in Attitude and Communication some of the major factors that enter into attitude change are discussed. The authors investigate "two main types of constructs which are needed to account for the internal relationships between the communication stimuli and observable effects. . . ."[18] One of these constructs is the internal mediating process. This construct accounts for "the differential effects of different stimuli on a given person or group of persons."[19] The internal mediating process consists of three responses--attention, comprehension, and acceptance.[20] Concept formation is derived from "comprehension." This response refers to the decoding of stimuli which includes "concept formation and perceptual processes

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[17] Ibid.

[18] Yale Studies in Attitude and Communication, Personality and Persuasibility. Irving L. Janis, Carl I. Hovland, et.al, Vol.II (New Haven: Yale University Press, 1961), 3.

[19] Ibid.

[20] Ibid.

that determine the meaning the message will have for the respondent."[21]

Freedman noted there was little research relevant to the "effect of involvement on maintenance of an original position. . ." in relation to concept formation.[22] This thesis was an examination of that problem. Subsequently, a study of this nature, that considers involvement and concept formation, might be useful for two further reasons. First, it might aid in bridging the gap between concept formation and the other cognitive processes of which Freedman spoke. Second, studying any technique pertinent to learning and the role it plays in the development of attitudes may provide a productive line of research for understanding and modifying attitudes.

Purpose of the Study

The specific purpose of this study was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. The method used to accomplish this purpose was concept formation. The purpose may best be explained by reviewing the Freedman study.

Freedman's objective was to investigate the "role of involvement in concept formation."[23] "The particular problem studied was the relationship between involvement and the amount

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[21] Ibid., 5. [22] Freedman, dissertation, p. 3.

[23] Ibid., digest.

and nature of concept change after exposure to three degrees of discrepant information."[24]

In the Freedman study the subject was given a position under high or low involvement. That is, the subject's involvement was induced by the experimenter. Freedman administered a two-part test in which the subject believed that his answer to the first part of the test was either correct or incorrect. On the basis of the subject's concern with the consequences of his response Freedman assumed he had induced high or low involvement.[25] If the subject believed his answer to the first part of the test was correct, Freedman assumed his instructions had induced high involvement in the situation. The converse held for the subject who believed his response to the first part of the test was incorrect. Freedman included a questionnaire at the end of his study to check on the induced involvement--whether or not the subjects had accepted the instructions and believed their answers were either correct or incorrect for the first part of the test. His check proved highly significant with a chi square of 112.68 at the .001 level of significance. On this basis Freedman assumed he had induced involvement.

In the second half of the Freedman study the subjects were exposed to concept instances with information that was slightly, moderately, or extremely discrepant from their initial position, and the maintenance or change in their

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[24] Ibid.

[25] Ibid., pp. 9-16.

position was measured. For low involved subjects there was a monotonic relationship--the greater the discrepancy the greater the change. However, under high involvement there was a non-monotonic relationship with the greatest amount of change under moderate discrepancy. Festinger's theory of cognitive dissonance provided the framework for interpretation of Freedman's data. Freedman analyzed his results in terms of the relative difficulty of changing positions (i.e. how hard it was for the subject to change from a position he believed was correct or incorrect), or simply rejection of information as a method of dissonance resolution.

Freedman used three degrees of discrepancy--slight, moderate, and extreme--to investigate the role of involvement in the amount and the nature of concept change. This thesis was based on the proposition that Freedman did not choose the most extreme degree of discrepancy that was possible in the system of varying discrepancy that he employed. He may have fallen short of realizing an actual communication situation in which an extremely opposite position could be represented by a counter communication. Freedman himself suggested a productive line of research might be closer examination of concept formation, discrepancy, and involvement at varying levels. This thesis provided the opportunity to investigate extremely discrepant situations with the hope of simulating the cognitive condition in which the highly involved individual is confronted with extremely discrepant information.

Freedman employed a concept formation task which oriented the learner toward a particular aspect (dimension) of the stimulus. The stimulus was inducing high involvement in the subjects. This type of concept formation is best explained by Earl B. Hunt:

> /The task is divided into two problems/. The first problem is a simple two choice discrimination--using binary dimensions--with one relevant dimension. The second problem requires either reversal or noreversal shift. In the reversal shift condition the 'correct' . . . instances all contain the binary value of the dimension which was relevant to the first problem and which was associated with the negative instances. In the nonreversal condition the discrimination is based on a previously irrelevant dimension. For instance, if the first task required that the subject learn that triangles, regardless of size, were 'positive' and circles were 'negative' the reversal shift problem would have 'circles' as positive and triangles as 'negative'. In the nonreversal condition small objects might be 'positive' and large ones 'negative'.[26]

Freedman used the binary system explained by Hunt to determine the levels of discrepancy in his study with one exception: Freedman chose four dimensions in lieu of the two that are employed in the binary system. By way of the concept formation situation explained above, then, Freedman investigated the "relationship between involvement and the amount and nature of concept change after exposure to three degrees of discrepant information."[27]

In this thesis the specific purpose was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. An examination of the research

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[26] Hunt, p. 74.

[27] Freedman, dissertation. digest.

related to concept formation, discrepancy, change and involvement will make the objective of this thesis clearer.

Chapter II

The Problem

Before presenting the actual problem studied here, a review of the research indicating the relationship among the concepts of involvement, discrepancy, change and concept formation is in order.

Review of the Literature

The research indicating the relationship among the above concepts may be divided into three general areas of concern: (1) shifts in concept formation and change, (2) involvement and change, (3) discrepancy and change. These divisions are followed in reviewing the research pertinent to the problem studied here.

Shifts in Concept Formation and Change

Card sorting experiments have been used to investigate shifts in concept formation. These experiments have generally produced results that indicate shifts in concept formation are positive and a result of the number of reinforcements in an original concept.

Grant and Berg, in 1948, analyzed the degree of reinforcement and ease of shifting in a concept formation task

using the card sorting method.[1] "The object of this experiment was to discover the functional relationship between degree of reinforcement of individual correct responses and the ease with which the S can shift from these responses to others in a multiple solution card sorting problem."[2] Grant and Berg expected that reinforcement of the correct responses could "serve a dual role."[3] First, increasing the reinforcement of a given stimulus-response relationship usually makes learning the given relationship easier. Also, this might be assumed to make the ease of shifting from an originally reinforced concept more difficult. Second, reinforcing single responses can cause the individual to make his response selective "to overall sequential characteristics of the situation."[4] The purpose of the Grant and Berg study was to investigate how these two learning principles functioned in a card-sorting problem.[5]

The resulting data indicated that "increasing the amount of reinforcement of original modes of responses reduced the amount of perseveration of these responses when they suddenly became correct."[6] This was indicative of the fact that the subject could reach a new correct response

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[1] D. A. Grant and E. A. Berg, "A Behavorial Analysis of Degree of Reinforcement and Ease of Shifting to New Responses in a Weigl-Type Card Sorting Problem," Journal of Experimental Psychology, XXXVIII (1948), 404-411.

[2] Ibid., p. 404.

[3] Ibid.

[4] Ibid.

[5] Ibid.

[6] Ibid.

more "readily after he deserted the 'old' correct response."[7]

Overall, this study indicated that shifts in concept formation are positive (easier) and are a result of the number of reinforcements in the original concept.

In 1954 Grant and Cost conducted a similar experiment. "The object of this experiment was to investigate further the functional relationship between the degree of reinforcement of individual responses and the ease with which the S can shift his mode of response. . . ."[8] A multiple solution card-sorting problem was the method empoloyed to investigate the relationship. This research provided further justification for the conclusions drawn in the Grant and Berg study: "The greater the number of confirming trials the more superior the subject's performance. . . ."[9] Of particular importance to this thesis is the fact that the Grant and Cost study supported the idea that shifts in concept formation are positive. This thesis was concerned with examining the amount of change or shift in position possible after an individual, involved with the consequences of his response, had formed a concept.

In research pertinent to shifts in concept formation and change, an additional line of research in reversal and

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[7] Ibid., p. 409. "A perseverative response was defined as a response to a new or shifted category which would have been correct for the immediately preceding category." p. 405.

[8] D. A. Grant and J. R. Cost, "Continuities and Discontinuities in Conceptual Behavior in a Card-Sorting Problem," Journal of General Psychology, L, 237.

[9] Ibid., p. 242.

non-reversal shifts has indicated that reversal shifts are easier. In concept formation studies the reversal shift uses correct instances that all contain the value(s) of the dimension relevant to solving the problem. Discrimination in non-reversal shifts is based on a previously irrelevant dimension.

> For instance, if the first task required that the subject learn that triangles, regardless of size, were 'positive' and circles were 'negative' the reversal shift problem would have 'circles' as positive and triangles as 'negative'. In the non-reversal conition small objects might be 'positive' and large ones 'negative'.[10]

Kendler and D'Amato also used a card sorting test to "evaluate a theoretical analysis of human concept formation behavior. . . ."[11] A primary assumption in their investigation was that concept formation behavior "consisted of a sequence of two successive S-R associations."[12]

> According to this formulation, the stimulus component of the first association would represent the test cards while the responses would refer to implicit verbal or symbolic responses made to them. The stimulus of the second association would represent the cue produced by the preceding implicit response while the response would be the overt card-sorting behavior.[13]

Kendler and D'Amato predicted that the reversal shift condition would occur "more rapidly" than the non-reversal shift.

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[10] Hunt, p. 74.

[11] H. H. Kendler and May F. D'Amato, "A Comparison of Reversal and Nonreversal shifts in Human Concept Formation Behavior," Journal of Experimental Psychology, XLIX (1955), 165.

[12] Ibid., 165. [13] Ibid.

Their prediction was based on the assumption that after the first association "symbolic cues" present would make the second association easier for the subject. They stated: "at the completion of the learning of the first concept, the symbolic cues appropriate to the second concept would be present for the Ss in the reversal group."[14]

The results supported their prediction. The experiment demonstrated the superiority of the reversal shift condition, and indicated a positive transfer effect, whereas the nonreversal shift condition proved to be a negative transfer effect.[15]

Kendler and Mayzner conducted a study closely related to the Kendler and D'Amato investigation.[16] An inherent difference between the two studies was found in the number of sorting categories that were made possible for the subject. In the Kendler and DÁmato study there were two possible card sorting categories available for the subject while in the Kendler and Mayzner investigation there were four card sorting categories. This made more than a simple two-choice discrimination possible for the subject after the reversal shift condition as was the case in the Kendler and D'Amato experiment. Kendler and Mayzner made the same basic prediction that Kendler and D"Amato had namely that the reversal shift

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[14] Ibid., 169. [15] Ibid., 174.

[16] H. H. Kendler and M. S. Mayzner Jr., "Reversal and Nonreversal shifts in Card-Sorting Tests with Two or Four Sorting Categories," Journal of Experimental Psychology, LVI (1956), 244-248.

condition would occur at a more rapid rate than the non-reversal shift condition. The results of the Kendler and Mayzner study bear out the findings of the Kendler and D'Amato investigation. A reversal shift occurred "more rapidly" than a non-reversal shift: "The results were consistent with this prediction in showing that a reversal shift was significantly faster than a nonreversal shift. . . ."[17]

The results of these experiments indicated that shifts (in the reversal shift condition) were positive and a result of the number of reinforcements in an original concept. This line of research has, at best, given involvement a subordinate role and has placed little emphasis on the maintenance or change of the first concept formed.

Involvement and Change

The experimental findings on involvement and change have not been as consistent as those in shifts in concept formation and change.

Hovland, Harvey, and Sherif conducted research "on reactions to communication and on attitude changes by individuals whose initial stands on a controversial social issue diverged in varying degrees from positions advocated in communication."[18] The controversial social issue used in this investigation was the topic of prohibition in Oklahoma. To examine involvement and attitude changes communications were

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[17] Ibid., 248.

[18] Hovland, Harvey, and Sherif, 244.

constructed "representing two opposite extremes and one moderate position on. . . /This/ego-involving issue /and/ were presented to Ss whose initial stands on the issue ranged from one extreme to the other."[19] The results were measured on a nine point scale, and were interpreted in terms of the "effect of their relative distance between S's own stand /involvement/ and the position advocated upon evaluation and placement of communication as well as acceptance-rejection of that position."[20] The results of their investigation pertinent to this thesis are the following:

> The most frequent result for Ss whose own stand diverges widely from that advocated in communication is to remain unchanged in their initial attitudes. More Ss with moderate position close to the stand advocated in the communication changed in the direction advocated.[21]

Hovland, Harvey and Sherif's research has indicated a negative relationship between involvement and change.

Zimbardo, however, has shown the opposite of this to be the case.[22] He explored the motivational basis of opinion change in situations of social influence in relation to Festinger's theory of cognitive dissonance.[23]

Zimbardo's investigation was to determine the relationship between conformity and "(a) the extent of the discrepancy between the opinion of a communicator and a recipient and (b) the degree of involvement of the recipient."[24] From

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[19] Ibid., 245. [20] Ibid. [21] Ibid., 251.

[22] Zimbardo, 93. [23] Ibid., 86. [24] Ibid., 93.

dissonance theory Zimbardo drew the following proposition: "Opinion change increases with increases in both involvement and discrepancy between communicator and recipient."[25] From his study he drew four conclusions that are basically consistent with this proposition:

1. Highly involved Ss changed significantly more than Ss not involved.
2. Opinion change increased significantly as the extent of the discrepancy between communicator and recipient increased.
3. The interaction between these variables was not significant.
4. The maxium dissonance group changed significantly more than the other groups, while the minimum dissonance group consistently changed least.[26]

According to Zimbardo, highly involved subjects are more consistent in the attitudes they have formed, whereas the reverse is true for low involved subjects. Hovland, Harvey, and Sherif noted a negative relationship between involvement and change. Zimbardo's findings, however, indicated the opposite of this to be the case. The relationship he discovered was a positive one. The highly involved subjects receiving maxium dissonance changed "significantly more than the other groups." His distinction between issue-involvement and response-involvement is held to account for the difference with the Hovland, Harvey, and Sherif study.[27] In a recent summary of sociological-psychological findings in attitude and attitude change Zimbardo offered the following conclusion:

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[25] Ibid. [26] Ibid.

[27] The reader is referred to Chapter I page 4 of this thesis.

> involvement with the content of the communication . . .decreases the acceptance of its conclusion. Involvement with the consequences of one's response increases the probability of change and does so more when the source-audience discrepancy is greater.[28]

Pertinent to this thesis is the idea that concern with the consequences of one's response increases the probability of change. Though experimental findings on involvement and change have not been as consistent as those concerning concept formation and change, Zimbardo's summary of recent research does provide a workable base for the present study.

Discrepancy and Change

Studies concerning discrepancy and change have generally been concerned with involvement and change. The principles applicable to the present study can be briefly stated.

Hovland noted that the relationship between discrepancy and change is affected by the individual's involvement.[29] He suggested that there is a direct relationship between discrepancy and change only at low (levels of) involvement, and that at high (levels of) involvement there is little relationship between discrepancy and change. In Zimbardo's summary of sociological-psychological findings a further refinement is made:

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[28]Phillip G. Zimbardo and Ebbe B. Ebbesen. Influencing Attitudes and Changing Behavior (Menlo Park, California: Addison-Wesley Pub. Co., 1970). p.22.

[29]Hovland, Harvey, and Sherif, 254. Hovland, 16.

a. The greater the discrepancy (between communication and recipient's initial position), the greater the attitude change, up to extremely discrepant points.
b. With extreme discrepancy, and low credibility sources, there is a falling off in attitude change.[30]

These findings appear to be particularly pertinent to a concept formation situation in which involvement is assumed to play an important role in investigating the relationship between discrepancy and change. Specifically, this research is important when considering highly involved subjects and the maintenance (or change) of an originally formed concept.

One final consideration which might also provide a base for understanding the effect of involvement and discrepancy on conept maintenance is Festinger's theory of cognitive dissonance.[31] Cognitive dissonance supports the idea that any two psychologically inconsistent cognitive elements produce dissonance (or tension) in the individual. There is a subsequent drive to relieve or reduce the dissonance. A measure of the individual's reduction of dissonance is indicative of his attitude change. In this case it is representative of the individual's maintenance (or change) of an originally formed concept.

Freedman considered this theory as a "general theoretical framework" for interpreting the results of his study. He applied cognitive dissonance in the following manner:

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[30] Zimbardo and Ebbesen, p. 22.

[31] L. Festinger, A Theory of Cognitive Dissonance (New York: Row, Peterson and Co., 1957).

> According to dissonance theory, as involvement in an element increases, discrepancy between that element and other elements produces increasing amounts of dissonance. Thus with high involvement in the initial concept, a given degree of discrepancy would be expected to produce more dissonance than under low involvement.[32]

Festinger's theory of cognitive dissonance, in league with Sherif and Hovland's assimilation-contrast theory, and Zimbardo's work on involvement, discrepancy, and conformity, may provide the necessary theoretical orientation for interpreting the results of this thesis.

What predicitions from these studies are relevant to the present investigations? The Hovland, Harvey, Sherif, and the Zimbardo studies have shown in general that the greater the discrepancy the greater the change that occurs. The Hovland, Harvey, and Sherif investigation indicated that under high involvement initial relationships breakdown, and extreme discrepancy may produce no change, or a situation indicative of negative change. From Festinger's theory we find that as involvement and discrepancy are increased increasing amounts of dissonance are produced. Hence we might expect some form of change in order that the individual may reduce the dissonance.

This thesis suggested that if there was any change it was not enough to be significant. Generally, this is consistent with Hovland, Harvey, and Sherif, and seems basically inconsistent with predictions from Festinger's theory. The

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[32] Freedman, dissertation. p. 5.

results of this thesis provide evidence bearing directly on this suggestion.

Statement of the Problem

This study was specifically designed to investigate varying degrees of high discrepancy consistent with the amount and the nature of change produced in highly involved individuals. A basic information processing problem in concept formation was used to determine this change. Freedman indicated that under conditions of high involvement there is change possible for the individual, but this change, if accrued, may be because the individual treats the highly discrepant information as irrelevant or as a special case, and not because the highly discrepant information produces greater and greater amounts of dissonance. He concluded his investigation of this aspect of involvement and discrepancy as follows:

> As expected, there tends to be less concept change under conditions of high involvement, and the effect of discrepancy appears to depend to some extent on the degree of involvement. It was concluded that involvement may be an important factor in concept formation.[33]

As mentioned in Chapter I, Freedman did not include any consideration of varying levels of high discrepancy. In effect he may not have produced the most extreme discrepancy possible with the concept formation instances he used. The possibilities for highly involved individuals to be confronted

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[33]Freedman, dissertation. p. 41.

with the most extreme discrepancy possible may not have been exhausted.

If an original position is either maintained or changed by a highly involved individual when he is confronted with varying levels of high discrepancy, then the following null hypothesis may reveal the nature of that maintenance (or change):

> With highly involved individuals in a concept formation situation there is no (significant) difference between the change scores of subjects presented different levels of high discrepancy except that which could be due to chance alone.

Chapter III

Experimental Procedure

The specific purpose of this thesis was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. A basic information processing problem in concept formation was employed to determine this change. The independent variable or stimulus each subject received was discrepancy, while the dependent variable which appeared and varied was the amount of change each subject exhibited from an initial position.

All subjects were given a concept formation task consisting of two parts. In both parts of the task the subjects were asked to solve a series of concept formation instances. By solving Part I of the task the subject assumed a position that he believed was correct. Part II of the task presented a series of concept instances extremely discrepant to the subject's answer for Part I of the task. The subject's response to Part II of the task was evaluated for change and statistical tests were used to determine the significance of the change. The following is a discussion of the concept formation task, subjects, and scoring.

Personality Questionnaire

Prior to Part I of the concept formation task the subjects took a 25 item personality questionnaire. The questionnaire was taken from the F and Traditional Family Ideology Scales and the Wesley Rigidity Scale.[1] Administration of the personality questionnaire was to enhance interest in and motivation for taking the test, and to impress the subjects with the fact that they would learn "important and interesting" aspects about themselves. The instructions presented before the personality questionnaire stated that the subjects were participating in a survey concerned with the relationship between "personality, intelligence, and perceptiveness." The instructions before Parts I and II of the task emphasized these same items.

Response-Involvement

The subject's commitment to his response in this task was of importance in this thesis.

In chapter I an explanation of the locus of involvement was presented. The use of involvement pertinent to this thesis was response-involvement which focuses on the individual's concern with the consequences of his actions or thoughts (responses). "If an individual is told that a reward

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[1]T. W. Adorno, et.al., The Authoritarian Personality (New York: Harper and Row, 1950). Elizabeth Wesley, "Perseverative Behavior in a Concept Formation Task as a Function of Manifest Anxiety and Rigidity," Journal of Abnormal and Social Psychology, XLVIII (1953), 129-134.

depends on how correct his response is, he becomes involved in his repsonse."[2] The subject's reward in this thesis was two-fold. His discovery of "important and interesting" aspects of his ability to judge rapidly and accurately social situations was primary. Secondly, by participating in the study he was also assisting in a survey designed to discover the relationship between "personality, intelligence, and perceptiveness."

Before administration of the task the subjects were given instructions in both Parts I and II designed to produce high involvement in their responses. The instructions stressed the subject's commitment to the "survey," and the fact that he would learn "interesting and important" aspects of his ability to judge rapidly and accurately social situations:

> This test measures your ability to solve problems and to make fast accurate judgements. It is closely related to perceptiveness in social situations. Specifically it has been found that the ability to give correct answers to these problems on the first attempt is an indicator of how wisely and efficiently you act in a wide variety of situations. People who get high scores on this test are good at forming first impressions of other people, at judging a situation accurately, and at discovering the most important point in a discussion or problem.
>
> The problems presented here are similar to situations in which it is extremely important to form an impression quickly and accurately. It has been found that this ability to form accurate first impressions of people or problems is one of the most important requirements for social and intellectual success.
>
> Therefore, speed of solution is the most important aspect of this test. There are two parts to the test. Your

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[2] Freedman, dissertation. p. 2.

> score depends mainly on how close your first answer is to the correct answer. Thus, your score depends chiefly on how correct your answer is on this part of the test. The second part will be explained later. There are three problems. You will be given only a few minutes for each, so work quickly. Make your answers brief and clear. Write legibly. Record your answers on the separate answer sheet.

On the basis of a previous study which used these same instructions it was assumed that high involvement was induced through these directions.

The Freedman study included a check to discover if the instructions were accepted by the subjects. Freedman included a questionnaire designed to discover in which part of the task the subject had been most involved. Tabulating results on these observations (questions on the questionnaire) Freedman reported a chi square of 112.68 at the .001 level of confidence. This highly significant chi square made it possible for Freedman's instructions to be used in this thesis to induce involvement in the testing situation. Freedman used a four-value concept formation task, and students in introductory courses at a large metropolitan university. The same type of concept formation task and subjects were used in this thesis. The above data indicated that the Freedman instructions would induce high involvement in the testing situation.

Magdelin D. Vernon's work supplies additional support for directions that can induce a certain cognitive state in an individual. She reported some experimental findings concerning perception, attention, and consciousness that are applicable here. Vernon suggested that an observer (subject)

might be "set" to interpret a situation in a certain manner on the basis of instructions given him:

> His expectations may be modified if he is told to look out for certain things, or certain aspects of the situation. Numerous experiments have shown that an observer may be 'set' to perceive by the instructions given him by the experimenter. . . .[3]

Vernon's comment that the "observer may be 'set' to perceive by the instructions given him. . . ." also indicates that instructions can induce certain perceptual or cognitively structured states in an individual such as concern with the consequences of his responses to specific stimuli. This, of course, is in league with Zimbardo's idea of response-involvement which implies an origin for involvement in the individual's concern with the consequences of his responses to a given situation or to a given stimulus.

Freedman's highly significant chi square, type of concept formation task employed, type of subjects chosen, and Vernon's findings that a subject may be "set" to "perceive by the instructions" would seem to indicate that experimenter directions can induce involvement in a given situation. Under these findings it was assumed that involvement could be induced in the subjects participating in this thesis.

PART I

The first part of the concept formation task the subject believed to be the most important. Part I was significant in that it established an initial position or base

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[3] "Perception, Attention, and Consciousness," Advancement of Science, 1960, p. 113.

against which the subject could measure additional information that might be discrepant. In relation to attitude theory the first part of the task was analogous to an attitude domain against which an individual might normally measure discrepant communications. Part I of the task was important, then, because it provided the subject a base to operate from when he was presented the discrepant information in Part II of the task.

In order of presentation, each subject received initial instructions on the first page of the test booklet to initiate interest in the testing situation. The first section of the test booklet included a personality questionnaire followed by a set of three examples of the kind of concept instances the subjects were to solve in the rest of the test booklet. The subject went over these examples by himself, and then the experimenter went over the examples with all of the subjects. When the subjects had completed the sample examples Part I of the task actually began.

Before beginning to solve the concept instances presented in Part I all subjects received the instructions elaborated under Response-Involvement. The subject read the instructions to himself and then the experimenter read them aloud. Following this, work on the three concept problems presented in Part I began.

For each of the three problems presented in Part I eight labeled instances were presented simultaneously. Five

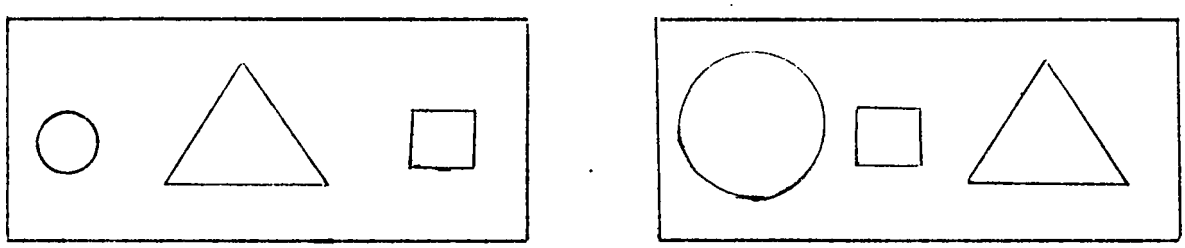
were labled positively as an example of the concept Alpha (or Beta and Gamma for problems two and three), and three were labeled negatively or (Not-Beta, Not-Gamma). The subjects were allowed three minutes to solve each problem, and they were not permitted to proceed to the next problem until the complete three minutes had elapsed. The answer for problem I was recorded on a separate answer sheet.

Each subject worked on the same concept instances at the same time for two reasons: first, to make the task seem more impressive and like an intelligence test, and secondly, to allow each subject equal opportunity to complete each problem.

The concept instances that each subject worked on were of two types--one positive example and one negative example. The subject was to determine the distinguishing characteristic between these kinds of examples to discover the true nature of the concept. The following are examples of the same kind of concept instances each subject examined:

Figure 1

Concept Instances for Part I of the Task



ALPHA NOT-ALPHA

Each concept problem consisted of instances similar to the above.

Problems II (Beta) and III (Gamma) consisted of lines,crosses, or dashes in lieu of circles, squares, and triangles as in the problem I Alpha example.

In part I, Alpha was the decisive instance for those discrepant "concept instances" presented in Part II (Alpha) of the task. Problems II and III were used here as they were in the Freedman study"to make the test seem more impressive and to increase the time interval between Parts I and II and thus make it less likely that Ss would remember the actual instances in Part I."[4]

Freedman described discrepancy as the "number of common elements (either dimensions or values) in the concepts."[5] The same interpretation was consistent in this thesis. That is, the greater the number of common elements, the more discrepant the concept instance becomes so that the most extreme discrepancy that could be achieved would be a concept instance in which any one dimension was continuous or had all common elements of itself. This definition was the basis for the varying levels of high discrepancy applied in Part II of the task.

Part II

The second part of the concept formation task the subject believed to be less important than the first part he had just completed. However, in terms of the dependent variable part II was the more significant section of the task for it

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[4]Freedman, dissertation. p. 13. [5]Ibid., p. 15.

was here that the actual change or maintenance occurred. Part I of the concept formation task established an initial position or base against which the subject could measure discrepant information. In terms of attitude theory the second part of the task was analogous to a counter communication situation in which an individual would be confronted with discrepant information. Part II was important, then, because it presented the discrepant information, as well as allowing the dependent variable to appear and/or vary.

In order of presentation for part II each subject received (1) instructions that emphasized his score on this part of the test depended on how close his answer for part I was to the correct answer, and (2) two concept formation problems similar to the instances presented in problem I part I. The instructions for Part II were as follows:

> In this part of the test you will see some more examples of the same problems you have already worked on. These examples fit the same rule that was correct before. The examples will be shown one at a time and after each one you must write down what you think the correct answer is. A separate page will be provided for these answers. You will be timed on each page so concentrate on the examples and decide what your answer will be so that you will have time to write it down on the next page.
>
> Although your score on this test depends chiefly on how close to the correct answer your first answer was, it is important that you work equally hard on this part of the test. We are interested in both parts of the test even though your score is based mostly on the first part. Remember, the correct answer to this part, to these examples, is the same as the correct answer to the examples you have already seen.
>
> **Consult the separate answer sheet and copy your answer to Problem I in the space provided below.**

An Alpha has:

(The S copied his answer for problem I part I in this space).

Throughout this part of the test you will be timed so work quickly. Several times during this test you will be shown a number of unlabeled examples. You must decide what kind of picture each is, and indicate your choice by checking the appropriate space below the examples. You will also be timed on these pages.

The subjects read these instructions by themselves and then the experimenter read the instructions to all subjects. When the instructions had been completed, the actual work on part II began.

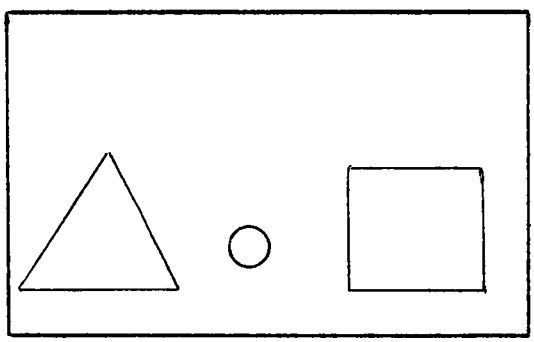
As in the first part of the concept formation task, labeled instances were presented in part II also. Again, the subjects were allowed three minutes to solve each problem, and they were not permitted to proceed to the next problem until the complete three minutes had elapsed. The answers for this part of the test were recorded on a separate answer sheet.

The subject's task in this second part of the concept formation test was to determine the distinguishing characteristic among the concept instances he examined. Depending on the test each subject received (randomly assigned), there were three kinds of concept instances presented. Each particular concept instance was representative of one level of high discrepancy inherent to part II of the test. In effect, there were three groups of subjects dependeing on the level of discrepancy (high, higher, highest) each test represented. The

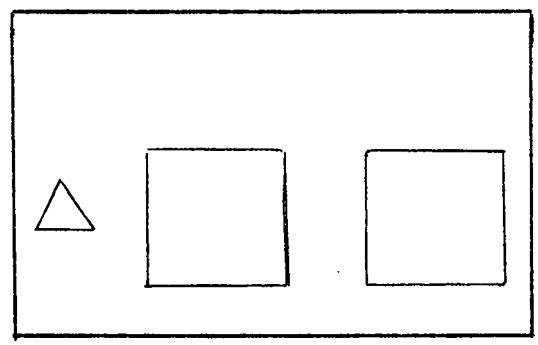
level of discrepancy for each of the three kinds of tests in part II was determined by the number of common elements the concept instances contained. The greater the number of common elements (dimensions or values), the greater the discrepancy became so that the most extreme discrepancy was a concept instance that had all common elements of itself. The following are examples of the concept instances representative of the level of discrepancy for each group:

Figure 2

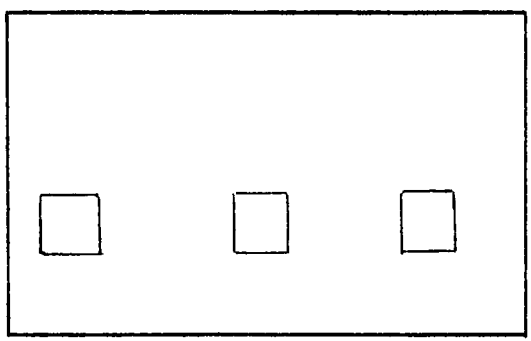
Concept Instances for Levels of Discrepancy



High Discrepancy



Higher Discrepancy



Highest Discrepancy

Part II of the concept formation task was divided into two problems as was the case for problem I of part I. Both problems in part II were concept instances similar to the first problem of part I. The decisive instances in the concept formation task then were problem I of part I (Alpha) and the problem presented in part II (also Alpha).

As the examples above indicate, the levels of discreancy were determined by the number of common elements (dimensions or values) contained in each concept instance. The discrepancy for each concept instance varied on the basis of size, shape, location, and number of dimensions. The size was a matter of one element being either larger or smaller than other elements in the same concept instance. The shape of the element either a triangle, a square, or a circle. The location was simply where the element appeared in the box in each concept instance (first, second, or third). As mentioned above, the greater the number of common elements, the more discrepant the concept instance became, so that the most extreme discrepancy that could be achieved was a concept instance in which all dimensions and values were the same.

A discussion of subjects and the technique for measurement follows.

Subjects

A total of 128 subjects participated in this study. Eight were eliminated for not completing one of the parts of the concept formation task. Consequently, 120 subjects,

51 male and 69 female, were used in the tabulation of the results. These subjects were enrolled in Speech 131 (the Fundamentals of Speech Course) regular day sections of the first summer term of 1970 at the University of Houston. The sections of Speech 131 participating in this study were randomly chosen. After all subjects completed the test they were told they had participated in a study conducted for a Master's thesis.

Scoring Technique for Measurement

Scoring for the degree of maintenance (or change) in this thesis followed the same procedure employed in the Freedman study. For instance, maintenance of the original position (that assumed after completing Part I of the test) was considered a perfect maintenance. Any subtraction or addition of elements indicated a variation from the initial position or original concept the S had formed.

The scoring for maintenance (or change) was done on a seven point scale ranging from 0 (no change) to 6 (maximum change). In effect, the number of elements in the subject's answer to part II of the test that were common with the elements in his answer to part I were the basis for scoring. If there were no elements in the subject's answer to part II that were common with his response to problem I of part I then he received a maximum change score of six (6). The fewer the common elements in S's responses for part I and part II, the

higher was his change score. The subjects who maintained consistency to some degree received lower or no change scores.

Scoring for the tests was divided into three groups. Each group represented one of the levels of high discrepancy (high, higher, highest). Part II of the concept formation task represented one of these levels of discrepancy, and each subject's score was categorized in terms of the level of discrepancy the concept formation task represented.

Statistical Treatment

The three groups were analyzed for their specific variance, and the significance of the difference between and within groups was determined to decide if each group could have been fairly drawn from the same population. A *t* test was run on male and female subjects to see if scores for each should be treated differently. An analysis of variance was run on the three groups to determine if the differences in the change scores among the three groups were significant. A discussion of the results follows.

Chapter IV

Results

The specific purpose of this thesis was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. The purpose of the statistical analysis presented here was to determine the significance of the change.

Source of Data

The source of the data for this thesis was the subject's response to the second part of the concept formation task. The subject's response to part I of the task offered him a base from which to operate and provided the experimenter a standard against which to measure the subject's maintenance or change. Any deviation in the subject's response to Part II from his response to Part I indicated that there had been change. The amount and the nature of this change was determined by the number of common elements in the subjects responses for Parts I and II. The scores ranged from 0 to 6 on a 7 point scale with 6 indicating the maximum amount of change and 0 indicating no change or perfect maintenance of the original response. All scoring was done by the experimenter. An interrater reliability coefficient was calculated for 15 randomly selected tests.

A coefficient of .98 indicated that experimenter scoring was reliable.

The subjects were randomly divided into three groups, and each received a different level of high discrepancy. Raw scores were collected on each group of subjects and the significance of differences between and within groups was calculated. In calculating the significance of the change the subjects were further divided according to sex, and a statistical test of difference was applied to determine the significance of the difference between male and female scores.

Mean Differences for Male and Female Subjects

A student's *t* (Runyon and Haber method) was calculated to determine the significance of the difference between means of the change scores for male and female subjects. The intent here was to determine if male and female responses should be treated separately. For purposes of statistical analysis it was postulated that there was no difference between population means for male and female subjects. In effect, the student's *t* was to determine if the different sexes responded differently to the concept formation task. The *t* was to decide only if the difference in means was significant or not. Consequently, the *t*-test was non-directional.

The mean for each group was determined, and the critical value of *t* was calculated. The following chart is a summation of the relevant statistics:

Figure 3

DIFFERENCE BETWEEN MALE AND FEMALE CHANGE SOCRES

	N	X	X^2	$\bar{X}$	($\underline{t}$ = .052)
MALE	51	84	354	1.060	
FEMALE	69	224	1104	3.02	

At both the .01 and .05 confidence levels critical values for the t of .052 were nonsignigicant. We must assume then that male and female subjects did not respond differently on the concept formation task. Sex did not appear to influence responses on the dependent variable.

After the mean evaluation for male and female subjects was conducted an analysis of variance on the three groups of subjects was considered.

Mean Differences Between and Within Groups

The intent here was to observe the change in the subject's responses to Parts I and II of the concept formation task, and to determine the significance of that change. An analysis of variance was conducted on the raw data from the three groups of subjects to discover the significance of difference in the change scores. All groups were dependent on each other since each took the same Part I concept formation task, and all subjects included in the study had a response for Part I.

The appearance (or "non-appearance") of change in the subject's responses from Part I to Part II was observed. Any alteration in the subject's answer from Part I to Part II indicated a change. Theoretically, the subjects could only change in one direction (toward the position indicated by the instructions for Part II, and by the type of concept formation instances), but for purposes of statistical analysis it was important to note only that change had been oberved. This in itself was an indication that the experimental treatment was producing the differences among the means of the various groups.

The mean for each group was calculated and the differences between each group and its particular level of discrepancy was noted. The following is a summation of the relevant statistics:

Figure 4
MEAN CHANGE SCORES FOR EACH LEVEL OF DISCREPANCY

	N	X_{tot}	X^2	$\bar{X}$
Group I	40	121	573	3.020
Group II	40	104	468	2.060
Group III	40	140	724	3.050

As mentioned earlier, the analysis of variance was conducted to assess the significance of the differences among groups to determine if the experimental treatment was producing the differences in means. The following chart is a summary

of the relevant statistics for the analysis of variance that was conducted here:

Figure 5

ANALYSIS OF VARIANCE BETWEEN AND WITHIN GROUPS

Source of Variation	Sum Squares	Degrees of Freedom	Variance Estimate	F
Between-Groups	16.212	2	8.106	1.485
Within-Groups	638.58	117	5.457	
Total	654.792	119		

At both the .01 and .05 levels of confidence the F-ratio of 1.485 proved insignificant. This lack of significance probably indicates a chance difference between the specific comparisons. To investigate specific hypothesis in this case then would prove inconsequential. The insignificant F suggests that the subjects were drawn from the same population, and that we must entertain the null hypothesis.

Summary

The purpose of this thesis was to examine the amount and the nature of the change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. Change scores were computed for each subject, and an analysis of variance was employed to determine the significance of the differences between means

for the three experimental groups. A simple student's t-test was used to determine the significance of the difference between means for male and female subjects. In both analysis of variance and t-test no significant differences were discovered. Critical values for both F and T were insignificant. Chapter V presents a discussion of these analyses.

Chapter V

Discussion and Conclusions

> Today we are more keenly aware than ever before of the differing beliefs, values, ways of life, and ideologies of various human groups and societies. These differences are reflected in the attitudes of individuals belonging to the various human groups. Because the differences are revealed in actual and potential conflict, problems of attitude and attitude change are among the most vital and timely in this world of rapid change.[1]

Resolving these inherent differences among individuals is an area in which the rhetorician is useful. In discovering the most effective means of presenting a particular communication so that the desired response is elicited, the rhetorician may assist in easing the conflict that results from the "differing beliefs, values, ways of life, and ideologies of various human groups and societies.

This thesis examined the relationship between two constructs that may assist the rhetorician in discovering the most effective means of presenting a communication. Involvement and change were investigated through a basic information processing problem in concept formation. As involvement was held constant for three groups, change was examined in relation to highly discrepant information. The specific purpose of this thesis

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[1]Sherif and Sherif, p. 1.

was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. This chapter is a discussion of the results of this investigation, the conclusions that can be drawn, and possible productive lines of research.

Discussion

Change

Change was investigated against an index of information processing problems in concept formation. The reason for examining change is most easily explained by the current concern with conflict in our culture.

Doubtless the rapidity of change in our culture is an area of concern for most of us. Seemingly, a perpetual state of flux exists in our society. Though this frenzie of instability is a focal point for progress in any society, it is also the origin of much conflict. A most immediate starting point for examining this conflict is the inherent differences among individuals as observed in their variance of judgements on social issues. These differences in judgments lead to obvious conflict. From this conflict comes the concern with change; that is, the desire of one group to change the attitudes, beliefs, or values of another group. The nature of the process of change for the individual, then, is usually examined in an attempt first, to "shed light" on the

change process, and second, to ease the conflict that normally results from change.

As mentioned in Chapter I most studies conducted to examine change have concerned specific social issues. Choosing a specific issue as a tool for examining the process of change may have produced results not indicative of the change process, but rather, results indicative of some aspect of change relative to the particular issue used. Consequently, an information processing problem designed to examine singly the process of change within the individual was used in lieu of choosing an issue through which to examine change. This section is a discussion of the attempt in this thesis to examine change in as pure a form as possible. The following are comments pertinent to the dependent variable of change.

The summed mean change score for all groups was 2.710 and ranged from 6 (maximum amount of change) to 0 (no change). Out of 120 subjects 38 had a change score of 6 and 30 had a change score of 0. The overall mean change score for those subjects who changed was 3.12. Though the analysis of variance at both the .01 and .05 levels of confidence indicated that the difference in the change scores produced in means for the three groups was not significant, there was an overall change suggested for the subjects. The overall mean change score of 3.12 indicated that the subjects did change; otherwise a lower mean change score would have been indicated. The range of scores nearly balances each other; 38 subjects had

a maximum change score of 6, and 30 subjects had a minimum change score of 0.

Most important is that there was change at all. As noted in Chapter IV, only that change occurred was important (i.e. direction of change was not of concern since "theoretically " the subject could change in only one direction). The fact that 90 of the 120 subjects altered their answer from Part I of the concept formation task to Part II indicated that the change process was in action and, of course, it also indicated the test and instructions were understood by the subjects. However, in regard to the specific purpose of this thesis, the amount of change for the three groups was not sufficient to be statistically significant.

The results of this thesis would have paralleled Festinger's theory of cognitive dissonance in terms of the insignificant trend. That is, the relation between high involvement, change, and high discrepancy is such that the greater the discrepancy and the higher the involvement the less change, if any, that occurs.

The mode of reducing dissonance is important here. Regarding the dependent variable, the most viable mode of reducing dissonance is to change. Again, in league with dissonance theory, the individual will choose the mode of reduction that will most likely reduce the dissonance, and most likely leave the least residual amount of dissonance. With respect to the type of answers given for Part II of the

concept formation task this seems apparent. To receive a score of 2, 3, or 4 for Part II of the concept formation task meant the subject was responding with a disjunctive answer--an answer in which the original concept was maintained with an additional element(s) added (See scoring. Chapter III). The point to be made is this: the subject was reducing the dissonance from the highly discrepant information in Part II by changing, but was choosing a mode for changing (dissonance reduction) that caused the least dissonance and allowed the least amount of residual dissonance. He was simply "adding to" an already formed concept, rather than changing completely. The part that involvement played in the subject's dissonance reduction may make this clearer.

Involvement

Several observations are important here. First, conditions in our society in which conflict results have inherent in them individuals who are highly involved in the issue at hand. Since the conflict results not only from differing judgments on particular issues, but also from the individual's involvement in it, then including involvement seemed to be a necessary adjunct for examining the change process.

Second, to investigate change in regard to high involvement approximates a specific problem in attitude change theory and the resolution of conflict in our society. As shown in Chapters I and II of this thesis the exact relationship between high involvement and change is not clear.

Finally, any change for high involved subjects is not only going to be more difficult for them, but, in terms of increased dissonance, is also going to be more urgent. The simplest mode of reduction for the subject is to completely reject the highly discrepant information. If this were the case, why were there not more scores of 0 for Part II of the concept formation task? A possible answer is that the drive for consistency in the individual is sufficiently great to cause some sort of assimilation of the discrepant information rather than a total rejection of it. Assimilating the discrepant information accounts for the mean change score of 3.12, and is in line with thinking in dissonance theory (the drive for consistency causes the individual to reduce dissonance in the easiest manner and with the least amount of residual dissonance). The assimilation of the discrepant information likewise accounts for the predominance of disjunctive responses in Part II of the concept formation task. That highly discrepant information necessitates more discrepant (in this case disjunctive) responses seems indicative. The inspection of scores within each group suggests this.

Each group of subjects received highly discrepant information and one group received the most extreme discrepancy possible. There were 40 subjects in each group. Group I received high discrepancy and had 20 disjunctive responses, group II received higher discrepancy and had 23 disjunctive responses, and group III, receiving the highest discrepancy,

had 27 disjunctive responses. Though not significant under analysis of variance, the number of disjunctive responses in each group does indicate a trend. The group that received the most extreme discrepancy possible had the greatest number of disjunctive responses, and as the discrepancy increased, the number of disjunctive responses increased. No generalization suggesting that as information becomes extremely discrepant the number of disjunctive responses increases can be statistically supported in this thesis. The trend mentioned here only implies that the addition of information to initially formed concepts may be the mode of dissonance reduction for highly involved individuals.

Involvement was held constant in this thesis. The instructions and the personality questionnaire were designed to inititate high involvement, and as was suggested in Chapter III all evidence indicates the subject may be "set" to perceive a certain way--involvement may be induced. Since all subjects were highly involved in the testing situation, it was assumed that each subject worked equally hard on both parts of the test. As discrepancy increased and involvement remained constant, the number of disjunctive responses increased. The greater the discrepancy the greater seemed to be the number of disjunctive responses. Again, though this is not statistically significant, the trend implies that highly involved subjects do not necessarily "cast off" ex-

tremely discrepant information but rather assimilate it in some manner that allows the least amount of residual dissonance.

Conclusions

The following conclusions are limited to the strictures of this thesis:

1. No significant F ratio for the three groups or student t for male and female differences was discovered for three levels of high discrepancy on high involvement when examined through a basic information processing problem.

2. There was no significant difference between male and female responses on the concept formation task.

3. 90 of the 120 subjects did change from an initially held position. The means of the group change scores were not significant under analysis of variance.

4. Of these 90 subjects who did exhibit change as discrepancy increased, a disjunctive (or assimilating) response was predominant for most. This would suggest that when highly involved individuals are confronted with highly discrepant information they do change an original (or initially) held position by assimilating the discrepant information (the simplest mode of dissonance reduction for involved individuals).

Summary

To assist the rhetorician in discovering the most effective means of presenting a communication this thesis examined the relationship between involvement and change. As the

rhetorician prepares to deliver discrepant information to an audience that is highly involved in his subject, he might do well to consider that such individuals may assimilate the discrepant information in such a way that there may appear to be no change in their positions. Their basic belief about his particular topic, however, may have been altered because they assimilated some of the discrepant information in his message.

To examine the relationship between involvement and change a basic information processing problem in concept formation was employed. The purpose of this thesis, then, was to investigate the amount and the nature of change produced in highly involved individuals when they were confronted with varying levels of highly discrepant information. The independent variable was discrepancy and the dependent variable was change. The subjects were given a concept formation task and the experimenter induced high involvement. Completing Part I of the task the subject assumed an initial position. Part II of the task presented information discrepant with Part I. The subject's response to Part II was compared to his response to Part I. The difference in the score was considered indicative of his change. Statistical tests of difference were applied to the results to determine the significance of the change. None of the change scores or means were found to be statistically significant.

Suggestions for Further Research

In the process of any experiment numerous problems or areas of interest arise which perhaps warrant additional research. The following suggestions might be worthy of further research:

1. This thesis examined only one level of involvement against three levels of high discrepancy through the concept formation task. Varying levels of discrepancy and involvement might be further researched using a concept formation task.

2. Concept formation attempts to examine information processing in as pure a form as possible. Consequently, it might be further used to more closely scrutinize the attitude and attitude change process; perhaps one of the following areas:

   a. Concept formation, involvement, and opinion change;
   b. Concept formation, involvement, and persuasibility;
   c. Concept formation as a method of determining speaker credibility;
   d. Concept formation as a method for initial audience attitude measure;
   e. Concept formation as related to _ethos_, _pathos_, and _logos_ in the persuasion process; and
   f. Concept formation as a method for predicting change and resolving conflict in the domain of attitude and attitude change research.

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Appendix A

Scoring Manual For Concept Discription

The general procedure is to give points for each element that has been changed. A dimension counts more than just a value within a dimension. The four dimensions are shape, size, position and number. In the example below, assume that the original concept was "triangle in the center." Thus, it involved the dimensions of shape and position.

1. No change--score 0.

2. A disjunctive concept including the original concept intact (e.g. a triangle in the center or a large circle) score 0

3. The original concept intact with an additional element (e.g. triangle in the center and a circle) score 1

4. For each value which is changed (e.g. from triangle to circle, or center to left) score 1

5. For each dimension that is dropped with no new one added (e.g. a triangle) score 2

6. For each dimension that is changed (e.g. a large triangle) score 3

7. A response involving none of the four recognized dimensions (e.g. dark lines) score 6

This is a duplication of the scoring method Freedman used.

Appendix B

Appendix B contains the concept formation test taken by all subjects. Included here are the instructions, examples, and Part I of the concept formation test. Appendix C includes the three forms of Part II of the concept formation test.

Name_____ Present Date_____
Classification_____

University of Houston

Personality Survey
(Revised Form)

INSTRUCTIONS

You are taking part in a survey. This survey is concerned with the relationship between personality, intelligence, and perceptiveness. You will be given several tests dealing with different aspects of your personality and certain of your abilities. Several professors will examine the results of this survey. Please read all the instructions carefully. There is to be no talking while this test is going on. Turn the page and begin work on the first questionnaire.

This test measures your ability to solve problems and to make fast accurate judgments. It is closely related to perceptiveness in social situations. Specifically it has been found that the ability to give correct answers to these problems on the first attempt is an indication of how wisely and efficiently you act in a wide variety of situations. People who get high scores on this test are good at forming first impressions of other people, at judging a situation accurately, and at discovering the most important point in a discussion or problem.

The problems presented here are similar to situations in which it is extremely important to form an impression quickly and accurately. It has been found that this ability to form accurate first impressions of people or problems is one of the most important requirements for social and intellectual success.

Therefore, speed of solution is the most important aspect of this test. There are two parts to the test. Your score depends mainly on how close your first answer is to the correct answer. Thus, your score depends chiefly on how correct your answer is on this part of the test. The second part will be explained later. There are three problems. You will be given only a few minutes for each, so work quickly. Make your answers brief and clear. Write legibly. Record your answers on the separate answer sheet.

LOOK UP AND WAIT FOR THE SIGNAL TO BEGIN

Personality and Opinion Questionnaire

The following statements concern your opinions about a number of social questions and your own feelings. The best answer to each statement is your personal opinion. Whether you agree or disagree with any statement you can be sure that many other people feel the same way that you do. Please mark every statement in the left margin according to how much you agree or disagree. Use +1, +2, +3, -1, -2, -3 depending on how you feel in each case.

+1:	I agree a little	-1:	I disagree a little
+2:	I agree pretty much	-2:	I disagree pretty much
+3:	I agree very much	-3:	I disagree very much

WORK QUICKLY

____1. What the youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.

____2. Some equality in marriage is a good thing, but by and large the husband ought to have the main say-so in family matters.

____3. Even though nowadays many different kinds of people mix together, there is no special need for a person to protect himself from catching an infection or disease from them.

____4. If children are told about sex, they are likely to go too far in experimenting with it.

____5. Young people sometimes get rebellious ideas, and it is too bad that as they grow older they get over them and settle down.

____6. I think that I am stricter about right and wrong than most people.

____7. People can be divided into two classes: the weak and the strong.

____8. I often start things I never finish.

____9. Women who want to remove the word "obey" from the marriage service don't understand what it means to be a wife.

____10. Science has its place, but there are many important things that must always be beyond human understanding.

GO ON TO THE NEXT PAGE

+1:	I agree a little	-1:	I disagree a little
+2:	I agree pretty much	-2:	I disagree pretty much
+3:	I agree very much	-3:	I disagree very much

____11. The most important qualities of a real man are not determination and driving ambition.

____12. Once I have made up my mind I seldom change it.

____13. A child should never be allowed to talk back to his parents, or else he will lose respect for them.

____14. Getting rid of the immoral, crooked and feebleminded people would not solve very many of our social problems.

____15. If people would talk less and work more, everybody would be better off.

____16. I never make judgments of people until I am sure of the facts.

____17. In most conversations I tend to bounce from topic to topic.

____18. The best teacher is the one who does not tell you exactly what is to be done and how to go about it.

____19. No sane, normal, decent person could ever think of hurting a close friend or relative.

____20. If a child is unusual in any way, his parents, should get him to be more like other children.

____21. Only the desire to achieve great things will bring a man's mind into full activity.

____22. A strong person will be able to make up his mind even on the most difficult question.

____23. When a person has a problem or worry, it is best for him not to think about it, but to keep himself busy with more cheerful things.

____24. More than anything else, it is good hard work that makes life worthwhile.

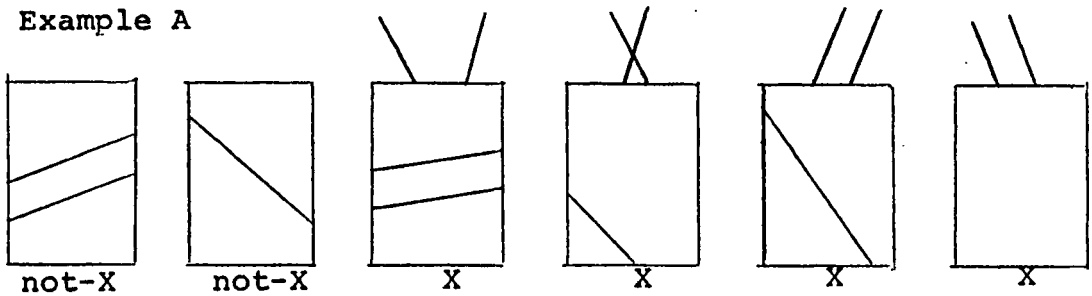
____25. There is hardly anything lower than a person who does not feel a great love, gratitude and respect for his parents.

BE CERTAIN YOU HAVE MARKED EVERY STATEMENT. LOOK UP AND WAIT FOR THE SIGNAL TO GO ON TO THE NEXT PAGE. DO NOT GO ON.

Perceptiveness and Problem Solving Test

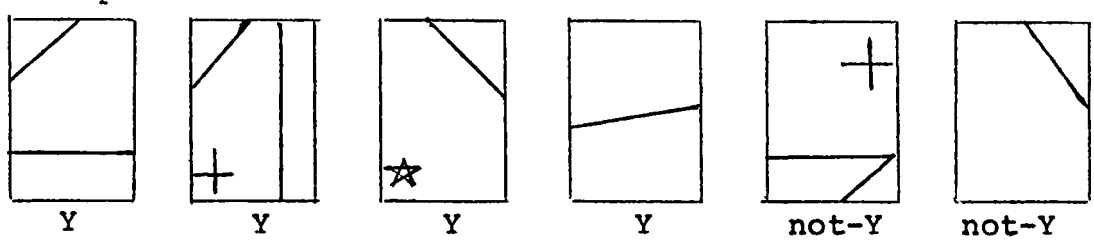
This test consists of a series of problems in each of which it is your task to discover how to tell apart two different kinds of pictures. You will be shown a number of labeled pictures, some of each type, and you must try to find out how to tell them apart. That is, you must decide what one type has that the other does not have. Look at the example below.

Example A



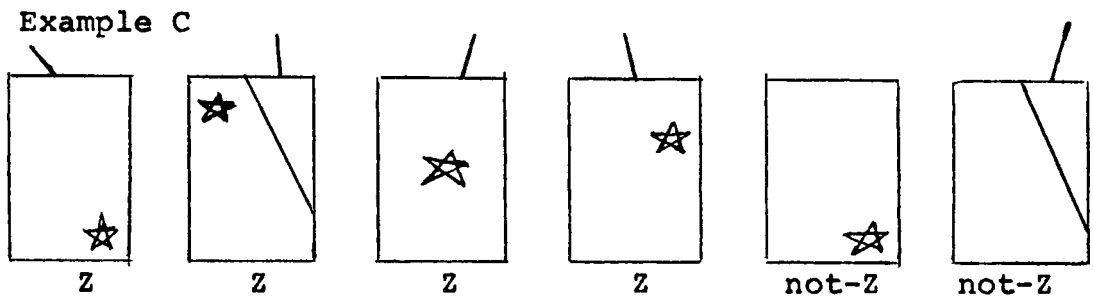
The correct answer is that an X has two lines projecting from the top. Note that the answer must be given in terms of what an X has, not in terms of what a not-X has nor in terms of what an X does not have. Make your answers short.

Example B



The correct answer is that a Y has either a line in the upper left hand corner or a star anywhere.

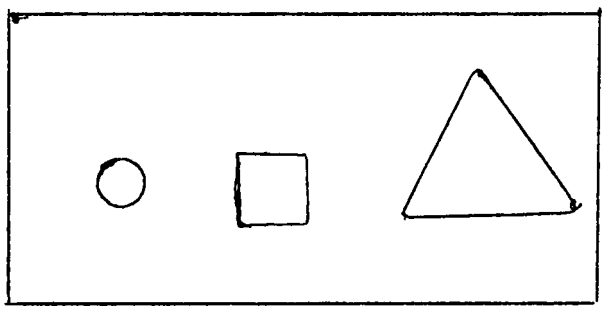
Example C



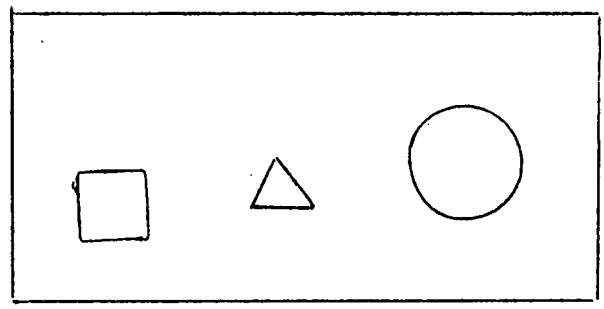
The correct answer is that a Z has a star and a projecting line. Both must be included because some not-Z's have one or the other. Turn the page for further instructions.

Problem I

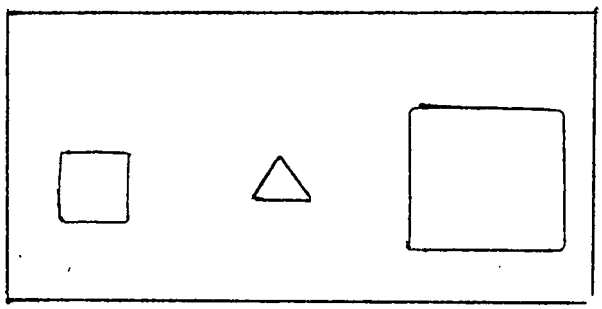
Look carefully at these pictures and decide what it is that an Alpha has that a not-Alpha does not have. Be sure to put your answer in terms of what an Alpha has. Write your anwer on the separate answer sheet.



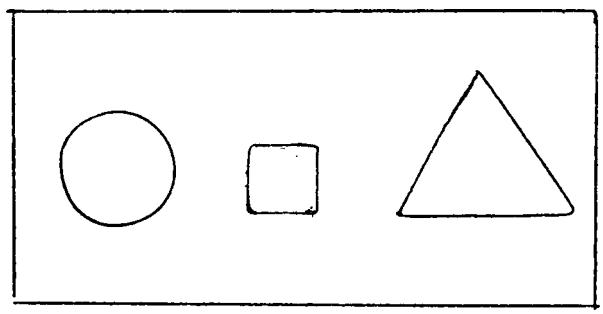
Alpha



Alpha



Alpha



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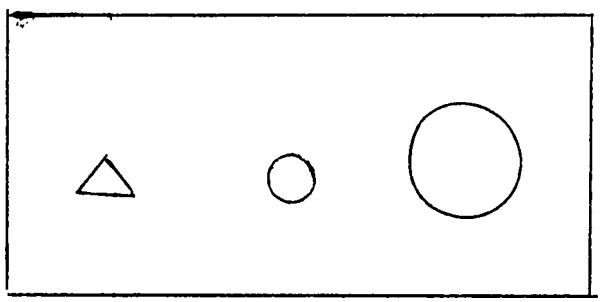
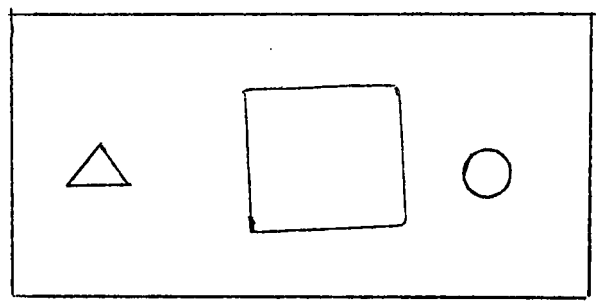
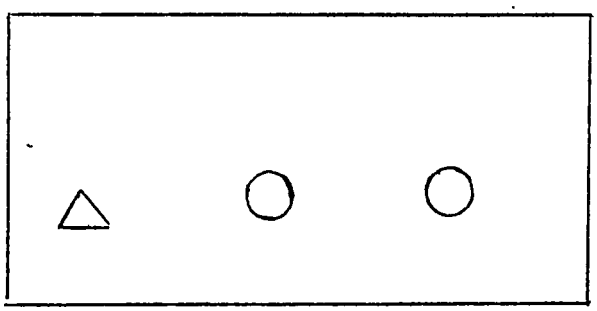


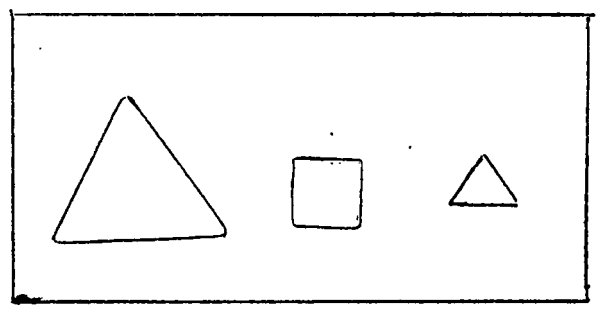
Alpha



Not-Alpha



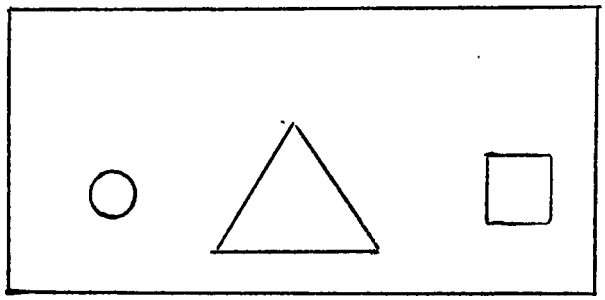
Not-Alpha



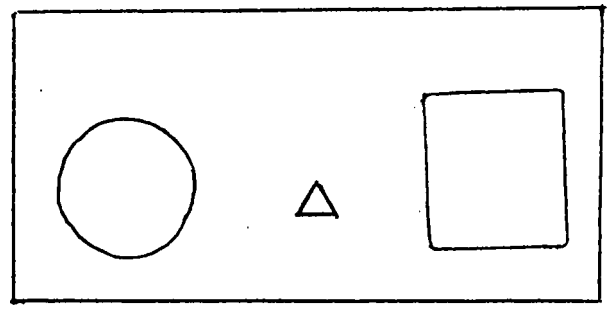
Not-Alpha

Problem I

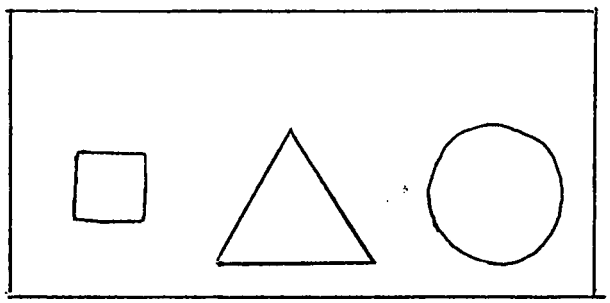
Look carefully at these pictures and decide what it is that an Alpha has that a not-Alpha does not have. Be sure to put your answer in terms of what an Alpha has. Write your answer on the separate answer sheet.



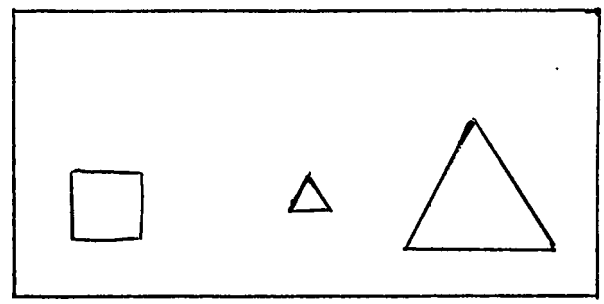
Alpha



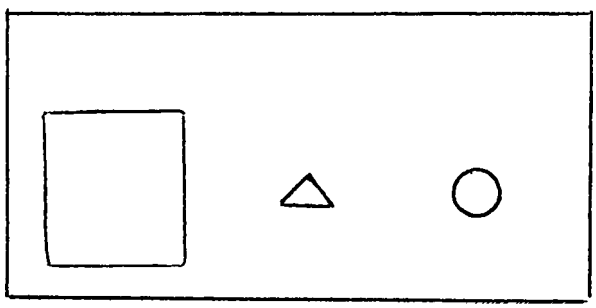
Alpha



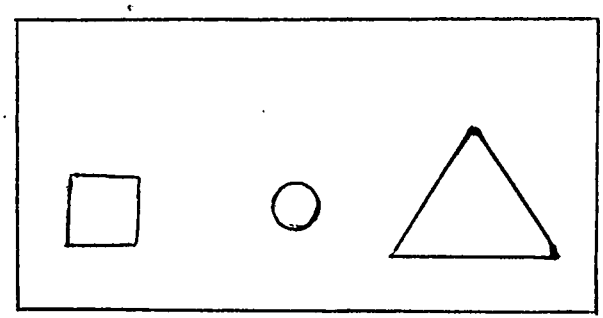
Alpha



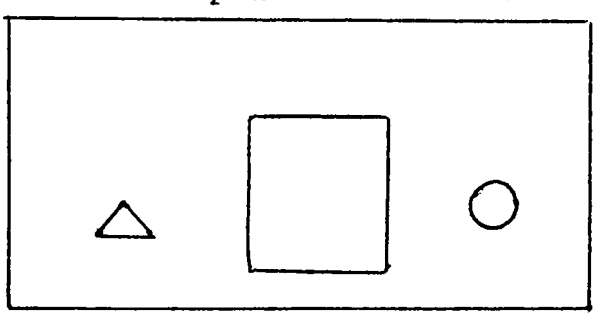
Alpha



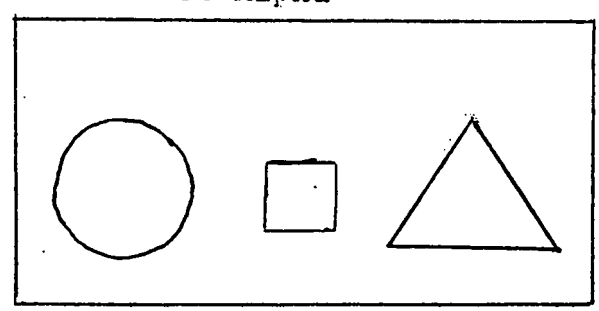
Alpha



Not-Alpha



Not-Alpha

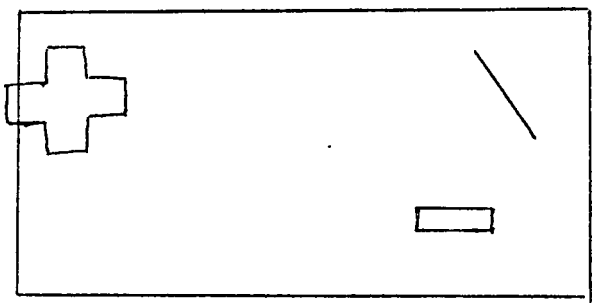


Not-Alpha

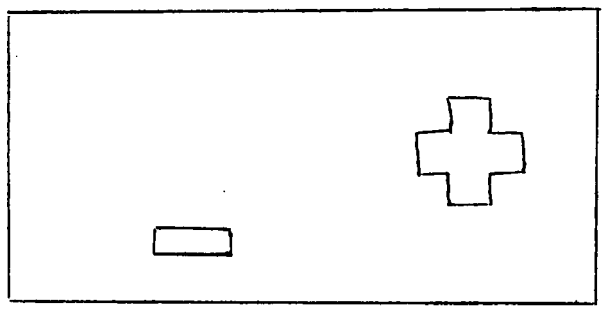
Record your answer on the separate answer sheet. Do not turn the page until you are instructed to do so.

Problem II

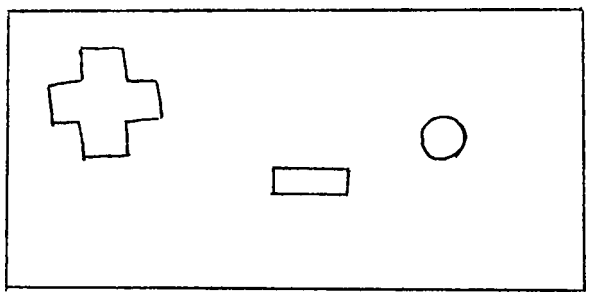
Look carefully at these pictures and decide what it is that a Beta has that not-Betas do not have. Write your answer on the deparate answer sheet.



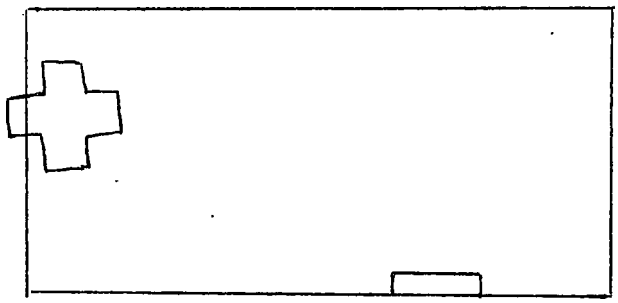
Beta



Not-Beta



Beta



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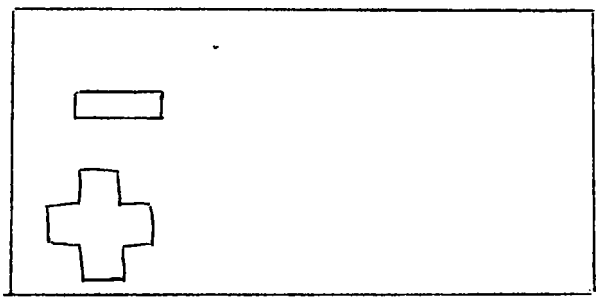
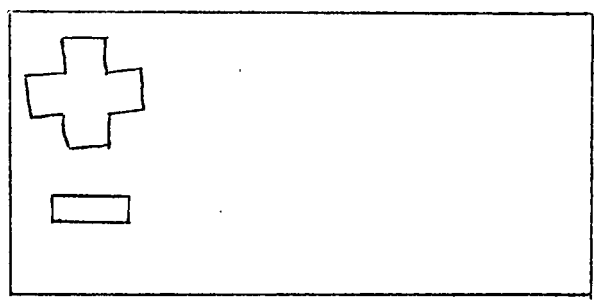


Not-Beta



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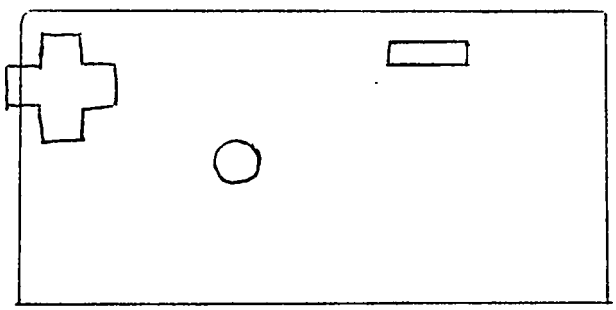

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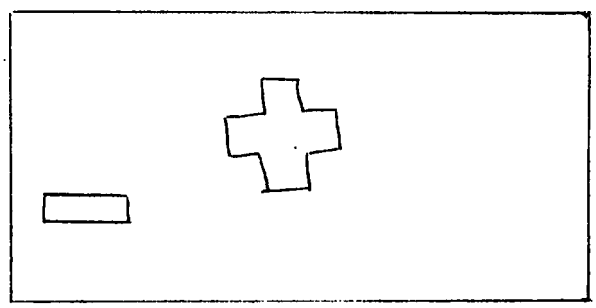
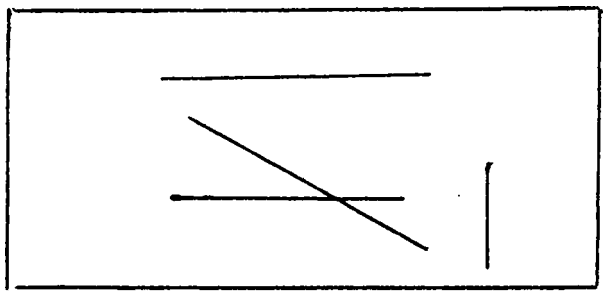


Not-Beta

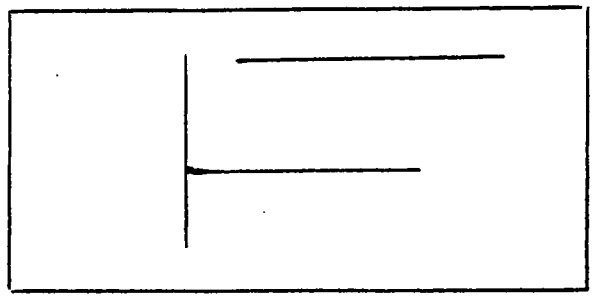
Record your answer on the separate answer sheet. Do not turn the page until you are instructed to do so.

Problem III

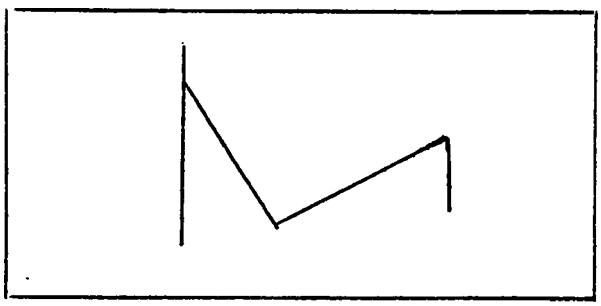
Look carefully at these pictures and decide what it is that a Gamma has that a not-Gamma does not have. Write your answer on the separate answer sheet.



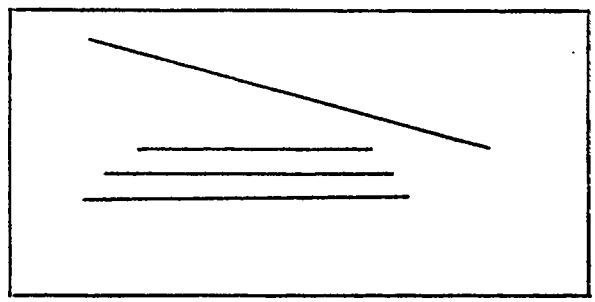
Gamma



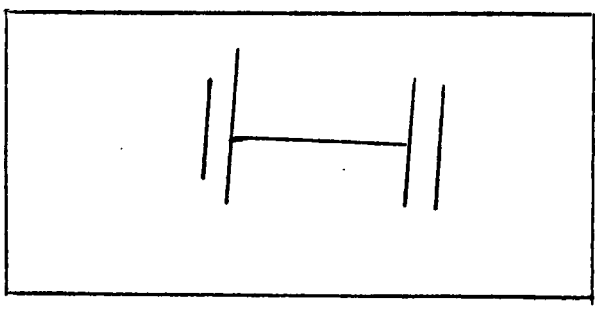
Not-Gamma



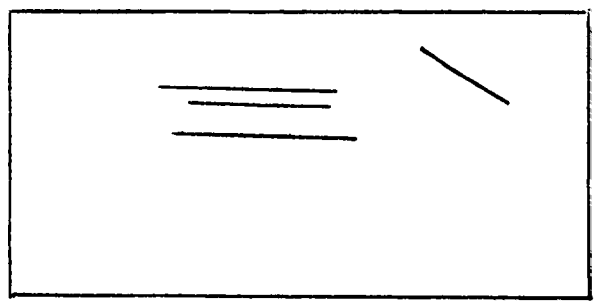
Gamma



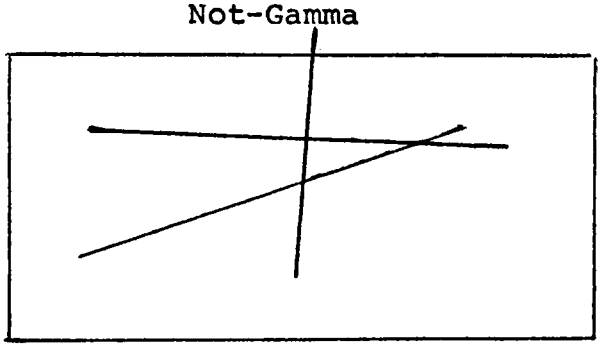
Gamma



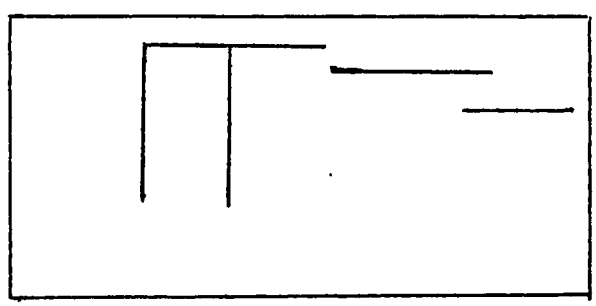
Not-Gamma



Gamma



Gamma



Not-Gamma

Record your answer on the separate answer sheet. Do not turn the page until you are instructed to do so.

Answer Page

Write your answer in the space provided below. Be brief and write legibly.

An Alpha has:

Part II

Instructions

In this part of the test you will see some more examples of the same problems you have already worked on. These examples fit the same rule that was correct before. The examples will be shown one at a time and after each one you must write down what you think the correct answer is. A separate page will be provided for these answers. You will be timed on each page so concentrate on the example and decide what your answer will be so that you will have time to write it down on the next page.

Although your score on this test depends chiefly on how close to the correct answer your first answer was, it is important that you work equally hard on this part of the test. We are interested in both parts of the test even though your score is based mostly on the first part. Remember, the correct answer to this part, to these examples is the same as the correct answer to the examples you have already seen.

Consult the separate answer sheet and copy your answer to Problem I in the space provided below.

An Alpha has:

Throughout this part of the test you will be timed, so work quickly. Several times during this test you will be shown a number of unlabeled examples. You must decide what kind of picture each is, and indicate your choice by checking the appropriate space below the examples. You will also be timed on these pages.

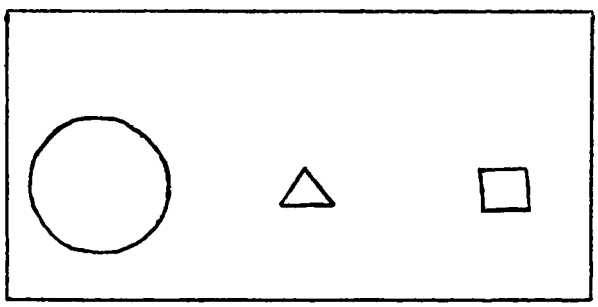
LOOK UP AND WAIT FOR THE SIGNAL TO BEGIN

Appendix C

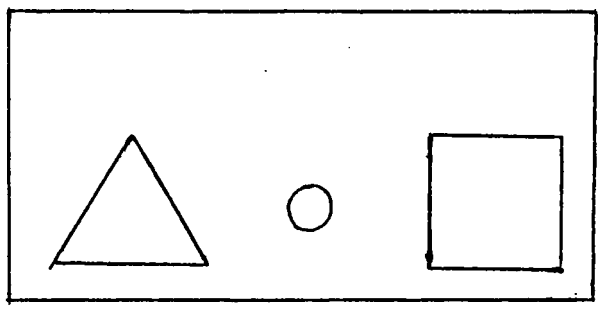
Appendix C contains the three forms of Part II of the concept formation test. This first form represents high discrepancy, the second higher discrepancy, and the third highest discrepancy.

High Discrepancy

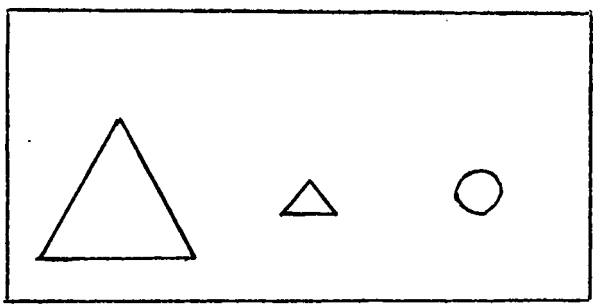
Decide whether each picture is an Alpha or a not-Alpha and mark your choice below each picture. DO THIS QUICKLY!



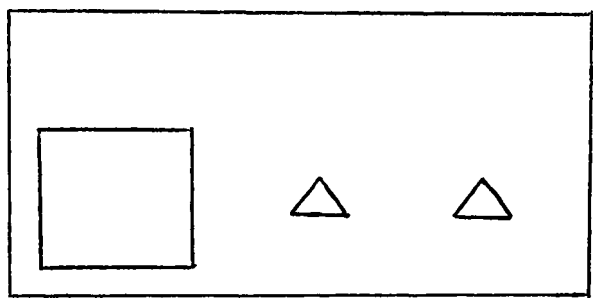
Alpha____Not-Alpha____



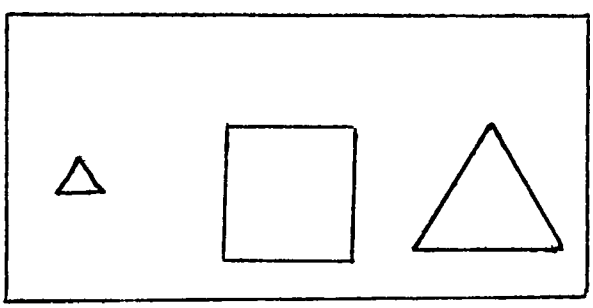
Alpha____Not-Alpha____



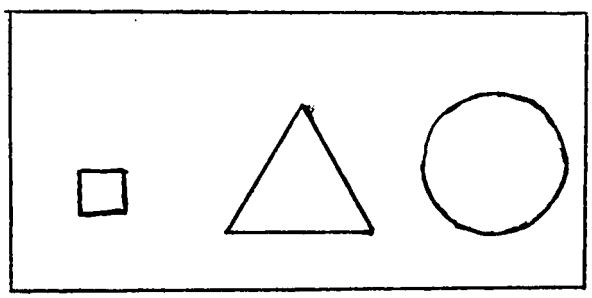
Alpha____Not-Alpha____



Alpha____Not-Alpha____

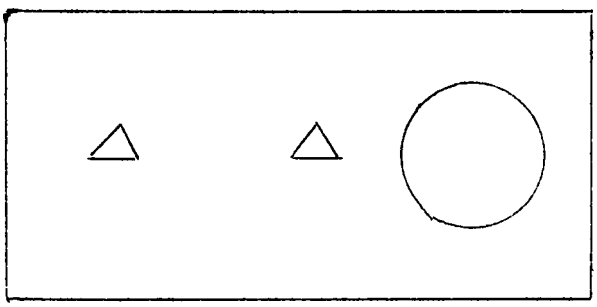


Alpha____Not-Alpha____

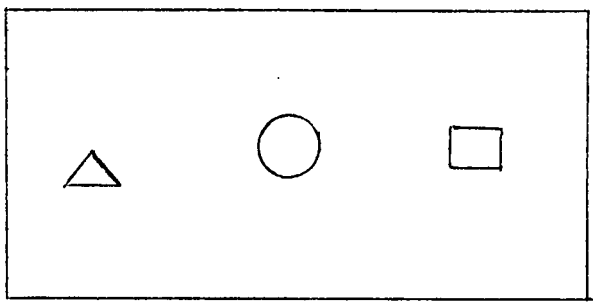


Alpha____Not-Alpha____

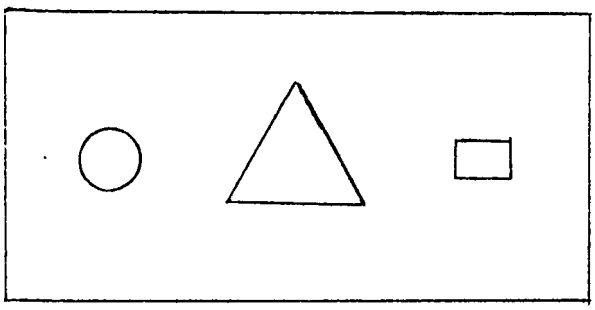
Decide whether each picture is an Alpha or a Not-Alpha and mark your choice below each picture. DO THIS QUICKLY!



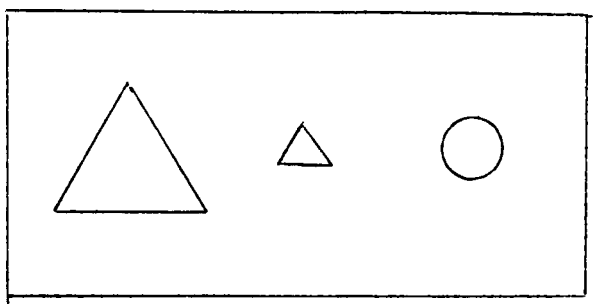
Alpha____Not-Alpha____



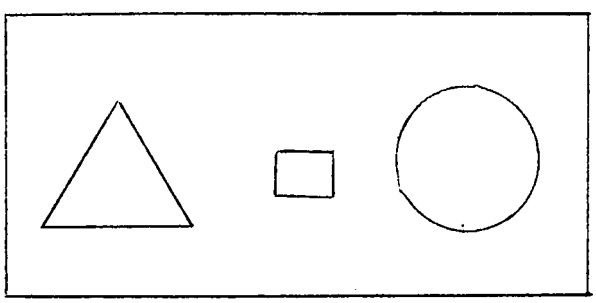
Alpha____Not-Alpha____



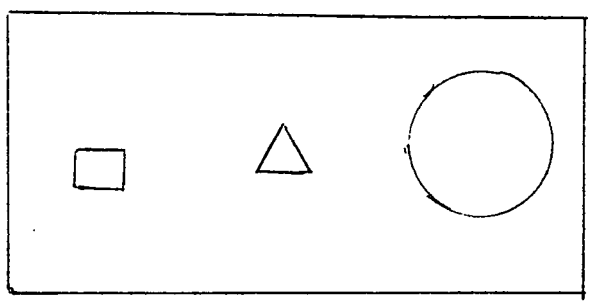
Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____

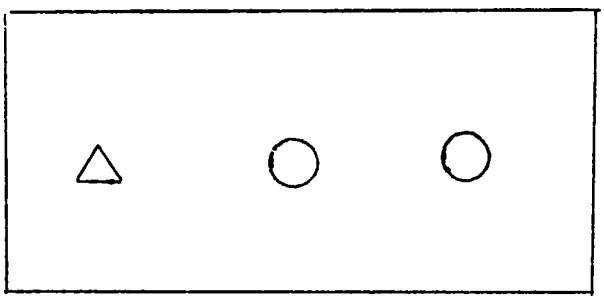
Answer Page

Write your answer in the space provided below. Be brief and write legibly.

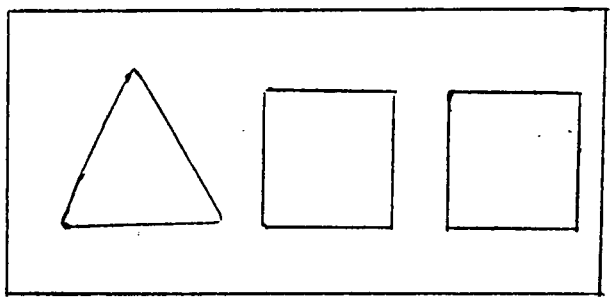
An Alpha has:

Higher Discrepancy

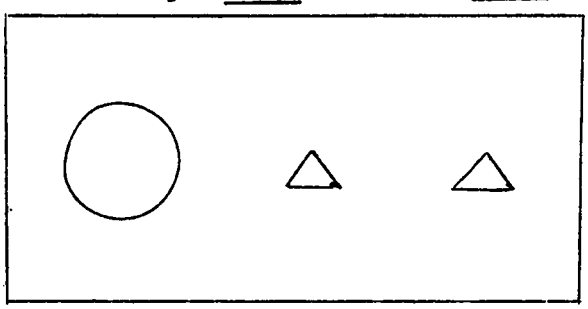
Decide whether each picture is an Alpha or a not-Alpha and mark your choice below each picture. DO THIS QUICKLY!



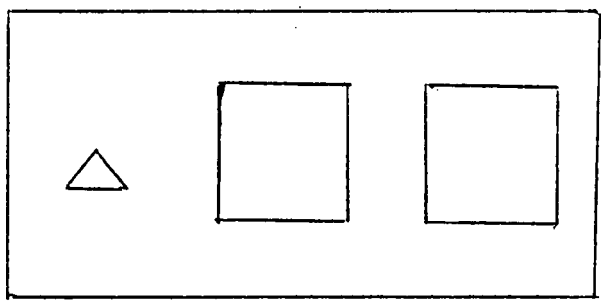
Alpha____Not-Alpha____



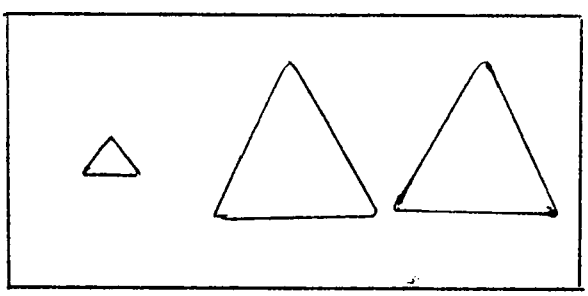
Alpha____Not-Alpha____



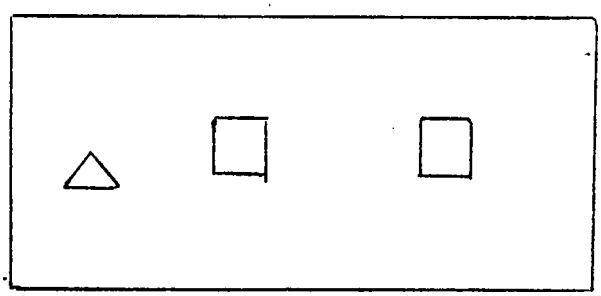
Alpha____Not-Alpha____



Alpha____Not-Alpha____

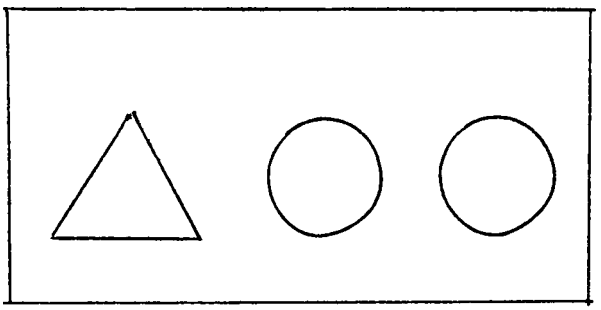


Alpha____Not-Alpha____

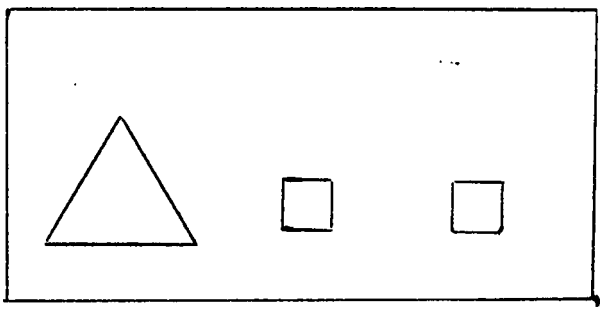


Alpha____Not-Alpha____

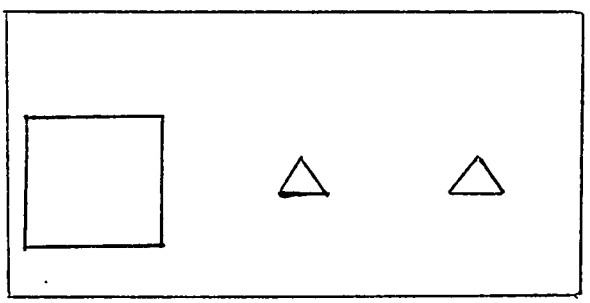
Decide whether each picture is an Alpha or a not-Alpha and mark your choice below each picture. DO THIS QUICKLY!



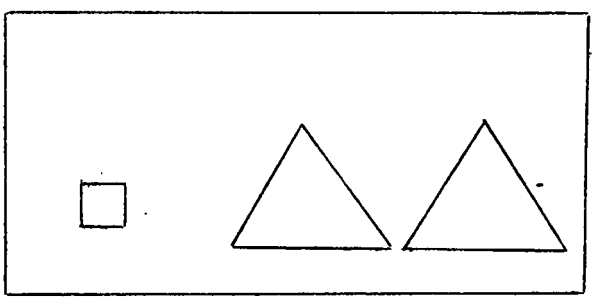
Alpha____Not-Alpha____



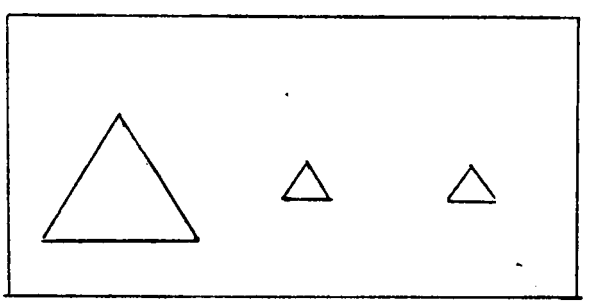
Alpha____Not-Alpha____



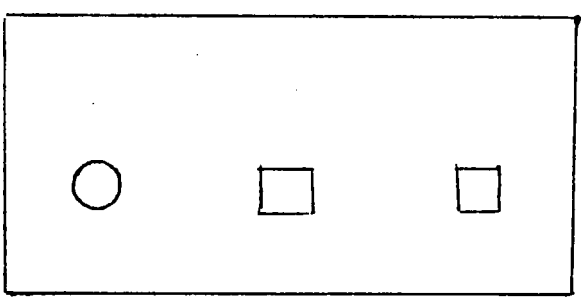
Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____

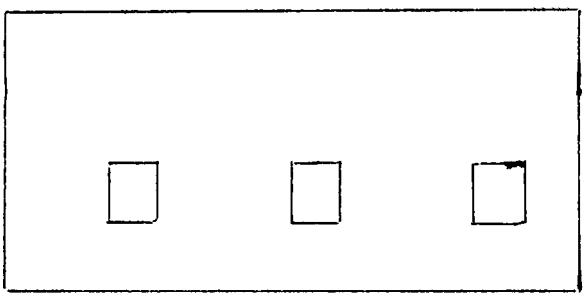
Answer Page

Write your answer in the space provided below. Be brief and write legibly.

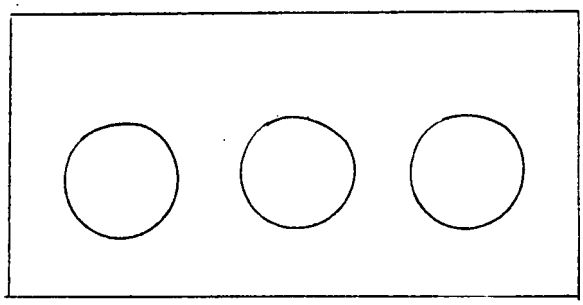
An Alpha has:

HIGHEST DISCREPANCY

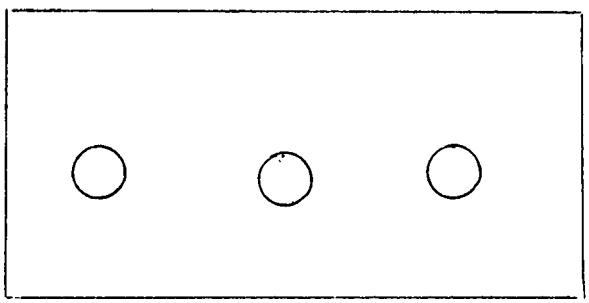
Decide whether each picture is an Alpha or a not-Alpha and make your choice below each picture. DO THIS QUICKLY!



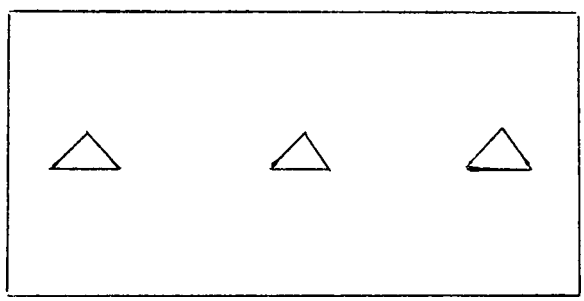
Alpha____Not-Alpha____



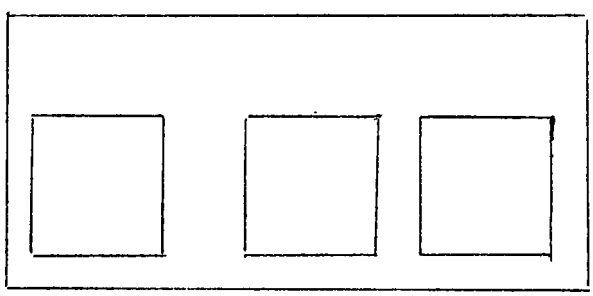
Alpha____Not-Alpha____



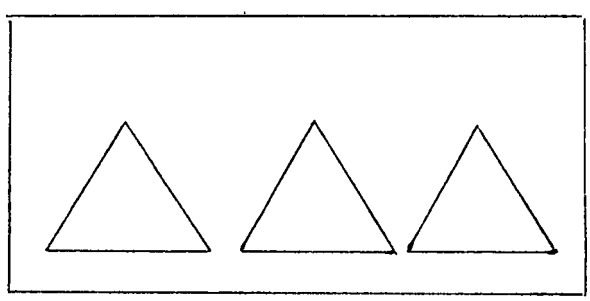
Alpha____Not-Alpha____



Alpha____Not-Alpha____

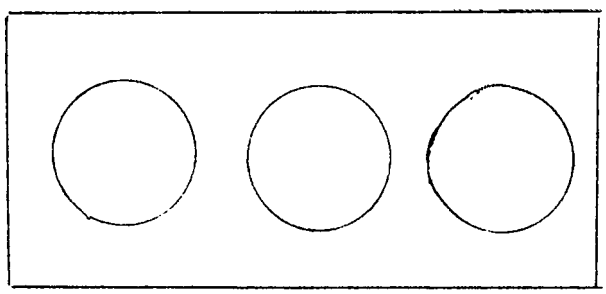


Alpha____Not-Alpha____

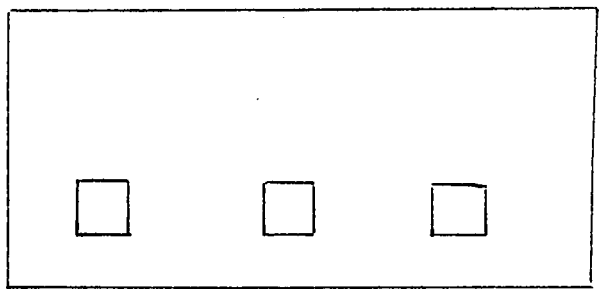


Alpha____Not-Alpha____

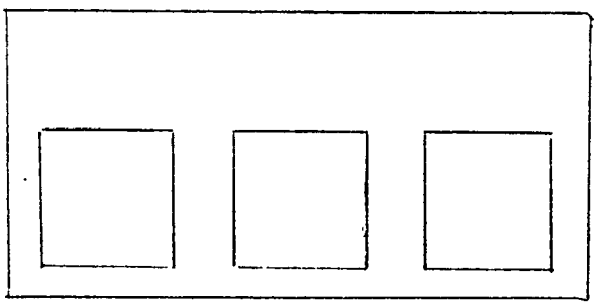
Decide whether each picture is an Alpha or a Not-Alpha and make your choice below each picture. DO THIS QUICKLY!



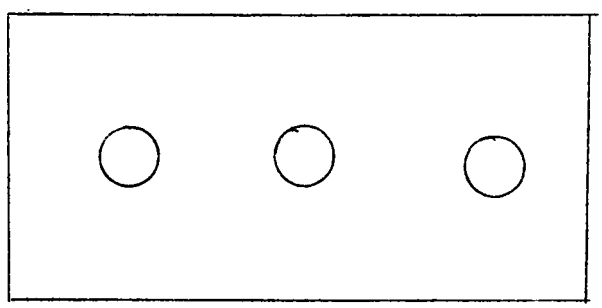
Alpha____Not-Alpha____



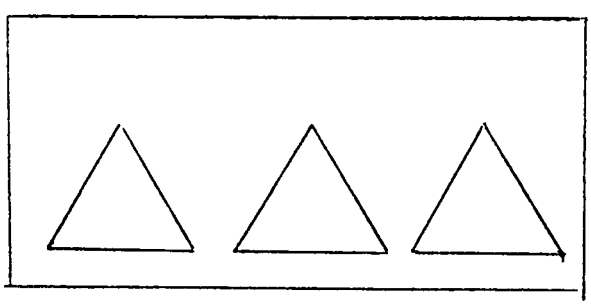
Alpha____Not-Alpha____



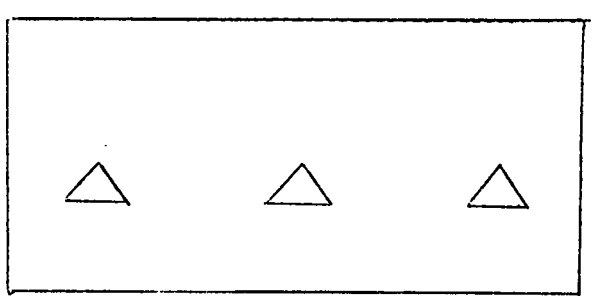
Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____



Alpha____Not-Alpha____

Answer Page

Write your answer in the space provided below. Be brief and write legibly.

An Alpha has:

Appendix D

Data

Raw Scores

Group I	$\bar{X}$=3.0205	Group II	$\bar{X}$=2.060	Group III	$\bar{X}$=3.0500
0	Male	6	Male	6	Male
2	0	2	1	3	6
6	0	2	0	6	6
0	5	0	1	6	6
3	2	1	2	6	6
5	0	0	2	6	6
6	4	3	1	3	6
0	4	6	0	0	6
2	2	1	0	6	6
0	0	6	2	0	2
4	2	1	3	2	6
4	0	6	0	2	3
0		2	0	0	6
6	Female	0	1	2	0
4	6	1	2	0	6
4	4	6	2	6	6
0	6	2	3	0	6
2	2	2	0	6	2
0	6	1	1	6	2
0	2	6	1	6	6
2	4	0	1	2	
4	6	6	4	6	Female
5	3	0	3	0	5
5	6	2		3	0
0	6	6	Female	6	6
4	4	3	4	0	6
4	5	6	0	0	4
6	0	0	3	2	0
6	5	4	6	5	0
3	4	0	6	0	0
6	2	1	1	4	2
4	0	2	6	6	6
6	0	2	1	6	0
2	0	3	6	6	0
6	4	6	2	0	2
6	4	0	6	6	2
0	0	1	6	6	3
2	2	1	0	2	6
0	6	4	6	2	3
2	3	3	2	6	0
121	6	104	2	140	0
(40 Ss)	6	(40 Ss)	6	(40 Ss)	2
	2		6		0
			6		