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Ethnocentrism, rigidity and intolerance of ambiguity in a probability matching situation

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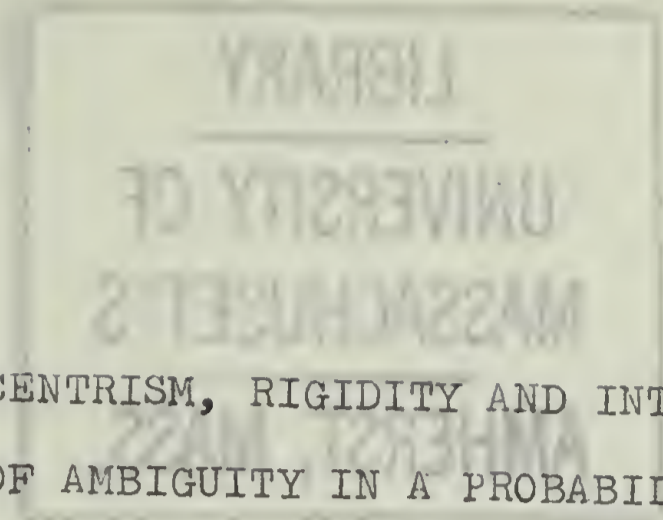


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ETHNOCENTRISM, RIGIDITY AND INTOLERANCE
OF AMBIGUITY IN A PROBABILITY
MATCHING SITUATION

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B.A., University of Miami

Thesis submitted to the Psychology Department
in partial fulfillment of the requirements
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INTRODUCTION

Of the various attitudes an individual can possess, none have been the subject of more research than ethnic prejudice. Ethnic differences have long been responsible for many of the conflicts between men and seemingly constitute one of the more important social problems confronting the social psychologist. One line of research attempting to gain insight into the dynamics of the prejudiced individual has focussed its attention on the personality variable known as "ethnocentrism." This term was first introduced and used descriptively by Sumner (1906) and had the general meaning of provincialism or cultural narrowness. This conception differs from the usual notion of prejudice, which is commonly regarded as a feeling of dislike against a specific group. Ethnocentrism, as used here, refers to a relatively consistent frame of mind concerning "aliens" generally and has to do not only with numerous groups toward which the individual has hostile opinions and attitudes but, equally important, with groups toward which he is positively disposed (Adorno, et al., 1950).

A major impetus in the study of ethnocentric ideology was provided by the publication of The Authoritarian

Personality in 1950. The authors were among the first to delineate the many personality variables associated with the highly ethnocentric individual. To further research in this area, Adorno, et al. (1950) developed an opinion-attitude scale for the measurement of ethnocentrism, subsequently called the E scale. In addition, they constructed a scale to measure prejudice without appearing to have this aim. It was their hope that this new scale, called the F scale, would correlate highly with the E scale and thus serve as a substitute for it. The F scale, which gives a rating on what has been called authoritarianism, correlates about .75 with the E scale and may thus be considered a reasonable substitute for it (Adorno, et al., 1950, p. 262). Thus, studies reviewed in the literature using the authoritarianism scale will be considered as having relevance to the study of ethnocentrism.

Adorno, et al. (1950) note that one of the most pervasive formal aspects of the personality organization of the extremely ethnocentric individual is his disposition to think in rigid, often stereotypical categories. As a consequence, he has no place in his life for ambivalence and he is extremely intolerant of ambiguities. Since stereotypical categorizations can never do justice to all aspects of reality, subtle but profound distortions can take place. It is the intent of this study to examine

these effects of ethnocentrism in a learning situation where the possibility of making such distortions presents itself.

Ethnocentrism and Rigidity

The hypothesized relationship between ethnocentrism and rigidity has been the subject of a considerable amount of investigation. Since the concept of rigidity has been used in many different ways, it would seem appropriate to examine the two major types of rigidity noted in the literature. One type refers to the tendency for a former response to continue when a new stimulus has been substituted for the old one and when another response might be more appropriate. This type of rigidity has been called "primary" or "process" rigidity or mental inertia. The second type of rigidity, which has been called "secondary" or "structural" rigidity (Cattell and Tiner, 1949; Goldstein, 1943) can be conceptualized in a manner similar to the first, only it refers more to a property of general mental organization. Recent experimental evidence suggests that these two types of rigidity are not necessarily correlated. Both Wolpert (1955) and Schaie (1955) failed to find consistent rigidity scores on batteries of at least five tests designed to afford their subjects an opportunity to express rigid behavior in different areas. Schaie (1955) did, however, factor out two distinct dimensions of rigidity corresponding to the primary-secondary

dichotomy.

The hypothesized high correlation between ethnocentrism and generalized rigidity made by Adorno, et al. (1950) seems to be based primarily upon the previous work of Frenkel-Brunswick and Rokeach. Frenkel-Brunswick (1949) found what she termed general rigidity in highly ethnocentric children, while Rokeach (1948), in an effort to show that the assumed rigid thinking processes of the ethnocentric individual characterize his approach to all kinds of problems, demonstrated that highly ethnocentric individuals, as measured on the E scale, are less likely to switch to easier solutions on the familiar water jar task, when compared with minimally ethnocentric subjects. He found similar results with a map problem devised in a fashion similar to the water jar test. These results, however, do not demonstrate a "generalized rigidity" in the ethnocentric individual, but rather that he is more susceptible to mental inertia.

Brown (1953), however, could not replicate this finding. He suspected that the relationship between ethnocentrism and problem-solving rigidity was dependent upon the establishment of a somewhat threatening, ego-involving testing atmosphere. He then proceeded to show that authoritarian scores and rigidity scores are significantly related only under ego-involving, anxiety arousing conditions. These

findings are consistent with those of Applezweig (1954) and Wolpert (1955), who both indicated that rigidity is more a function of conditions affecting the organism at the moment rather than as a trait operating in all situations. Brooks (1960) has also made the additional suggestion that behavior termed rigid may be a function of task complexity.

Jackson, et al. (1957) have also criticized Rokeach's findings. Using Einstellung arithmetic problems, the F scale and a reversed F scale in achievement conditions, they found that all three tests reflected acquiescence and conformity behavior. They concluded that the reported correlation between the water jar test and the E scale does not necessarily mean that authoritarians should be labeled rigid.

Meresko, et al. (1954) have also attempted to show that authoritarianism correlates highly with rigid cognitive functioning and/or rigid action. These investigators devised a Likert-type scale to measure rigidity of attitudes regarding personal habits and found that it correlated .62 ($p=.01$) with the F scale. In addition, they found that their subject's reactions to the new scale were individually consistent. They interpreted these results to mean that the authoritarian exhibits a generalized rigidity. Their interpretation of these findings, however, does not seem warranted, for rigidity of attitudes toward

idiosyncratic personal habits can hardly be equated with a more generalized syndrome of rigid cognitive functioning involving a complex series of operations between reality perception and behavior.

Additional studies attempting to show a correlation between E scale scores and various measures of rigidity have been those of Eriksen and Eisenstein (1953) and Applezweig (1954). Neither study found a significant correlation. Studies attempting to uncover a generalized rigidity syndrome have also yielded negative results (Applezweig, 1954; Schaie, 1955; and Wolpert, 1955). Zelen and Levitt (1954) have reported a correlation of .38 ($p=.01$) between their short form of the Wesley rigidity scale and the E scale. Thus far, the E scale is the sole potential criterion to which the Wesley scale has been found to be related, suggesting that they tap a similar personality variable (Zelen and Levitt, 1954).

In summary, then, it has been found that there is little consistent evidence demonstrating a correlation between ethnocentrism and rigidity, either of the primary or secondary type. In addition, there is no evidence for a generalized rigidity syndrome, either in normal subjects or ethnocentric subjects. There is some evidence that the reported, but unrelicated, correlation between mental inertia and the E scale may be attributed to either

acquiescence and conformity behavior or anxiety arousing conditions, thus suggesting that the ethnocentric individual should not necessarily be labeled rigid.

Ethnocentrism and Stereotypy

The conclusion drawn by Adorno, et al. (1950) that the ethnocentric individual has a tendency to impose pre-conceived and often stereotypical categories upon his experiences has received some experimental confirmation. Using an impression formation paradigm, three separate investigators have demonstrated that authoritarianism, as measured by the F scale, plays a systematic role in the formation of first impressions. Jones (1954) found that authoritarianism affects sensitivity to different ranges of social cues and evaluative judgment. Scodel (1956) found that highly authoritarian individuals will tend to estimate peers as having highly authoritarian attitudes, whether they have them or not. Kates (1959), using a different type of stimulus person, replicated these findings.

Using a different paradigm, Secord, Bevan and Katz (1956) devised a Likert scale to assess attitudes toward Negroes, and found that anti-Negro judges exaggerate the personality stereotype of Negroes, whereas pro-Negro judges deemphasize it. Frenkel-Brunswick (1949) found that highly ethnocentric children, in a story recall task, placed

Negroes in unfavorable circumstances more often than did children low in ethnocentrism. In another study, Frenkel-Brunswick (1949) reported that highly ethnocentric children attributed "dullness" to pictures of Negro children more often than did children low in ethnocentrism.

In summary, then, it has been found that highly ethnocentric individuals tend to project a variety of stereotypical conceptions on stimulus figures that do not have these conceptions inherent in them.

Ethnocentrism and Intolerance of Ambiguity

As has been mentioned, Adorno, et al. (1950) suggested that, as a correlate of rigid thinking, the highly ethnocentric individual is unable to tolerate ambiguity. Preliminary work done by Frenkel-Brunswick (1949) extrapolated this hypothesis primarily from an experiment in which a visual concept was slowly changed into a second visual concept. She felt that the highly ethnocentric subject's reluctance to give up the original concept about which he felt relatively certain pointed toward an inability to tolerate the ensuing transitional ambiguous situation. She further related this to a reluctance to think in terms of probabilities and a preference to escape into whatever seems definite and therefore safe.

The hypothesis that the highly ethnocentric individual is intolerant of ambiguity has been more directly tested by

O'Connor (1952), who found that ethnocentrism is positively associated with intolerance of ambiguity, when such intolerance is measured by a paper and pencil test. Similar results were found by Block and Block (1951), in an experiment using reaction time as a dependent variable. Following Sherif, who suggested that an operational manifestation of intolerance of ambiguity can be found in the rapidity with which an ambiguous situation is structured, they found that ethnocentrism, as measured by the Berkeley E scale, is positively related to intolerance of ambiguity, as manifested by the rapid establishment of a frame of reference in an autokinetic situation. These investigators theorized that the individual intolerant of ambiguity tends to resort to black-white solutions and to arrive at premature closure as to evaluative aspects, often at the neglect of reality. In a driven, compulsive manner, the relevant stimuli in the ambiguous situation are identified or supposedly relevant stimuli posited. Future behavior and response tendencies are then oriented relative to these initial "structural" landmarks because of their conflict-reducing potential.

These results have been confirmed by Harvey (1963), who found that authoritarianism disposes subjects towards faster and more rigid structuring of novel stimuli. In addition, Harvey (1963) also found that authoritarianism

disposes an individual toward increased closedness of his conceptual system and hence toward warding off events that deviate very far from his simple and narrow-banded interpretive schema. White (1965) has also confirmed the fact that authoritarians use more simple means of categorizing stimuli, but notes that this occurs only when syndrome relevant stimuli are used.

The Present Study

The present study was an attempt to demonstrate the presence of both primary and secondary rigidity in highly ethnocentric individuals, and replicate the findings of Block and Block (1951) and Harvey (1963) that ethnocentrism disposes individuals toward faster and more rigid structuring of novel stimuli when syndrome relevant cues are used, as suggested by White (1965). The E scale used in the present study is a modified 19 item version of the suggested final form of the California E scale (Adorno, et al., 1950, p. 142). The modifications consisted of minor changes in several items to up date them and the omission of one item which referred to a now dated out-group.

Following Frenkel-Brunswick's (1949) suggestion that increased ethnocentrism leads to a reluctance to think in terms of probabilities, the experimental task will be one of a probability matching nature. Research in probability learning has shown that subjects can learn to match the

input probabilities of neutral cues or percentages of reinforcement (Grant, Hake and Hornseth, 1951; Voss, Thompson and Keegan, 1959). This procedure has an advantage over the previously used more simple learning situations in that the input probabilities of cues and/or reinforcements can be directly compared with the frequencies of a subject's responses. Stereotypes can be conceived of in terms of a similar statistical framework. For example, an individual prone toward rigid categorizations (stereotypes) may meet 100 fat people, 95 of whom are also happy. If he was then asked to describe the personality dispositions of a fat person, one might suspect that he would say that fat people are all happy. On the other hand, a person not prone to stereotyping might say that fat people are mostly happy and that you meet occasional exceptions. In this case his response perhaps more accurately describes reality than does that of the individual prone to stereotyping. The applicability of a probability matching procedure to a situation of this sort has been demonstrated by several investigators, all of whom used stimuli of a more complex nature than the occurrence of simple lights. Frenkel-Brunswick reports that children can catch on to a probability matching task when asked to describe pictures of Negro children as either dull or bright, when a certain percent of the pictures are stated to be dull. She also

reports that the more ethnocentric children took longer to break their preconceived sets and respond to the actual probabilities used in the experiment. Hokansen and Doer (1964) found that human subjects can learn to predict the occurrence of interpersonal events at the same rate at which they actually happen. Their stimuli were neutral voices. Solley and Messick (1957) were able to show that something as complicated as the perceptual characteristics of stick-people can be probability matched. They varied their figures on the dimensions of color, height, mood and obesity and found that the joint probabilities of these characteristics could be learned, or matched. In this sort of situation, then, stereotypy can be defined in terms of the discrepancy between the input probabilities of a given cue and the frequency of a given response of a subject, or perceiver.

The stimuli used in the present investigation were similar to those used by Solley and Messick (1957), who used crude drawings of human figures. However, the present stimuli differed in that they were more human-like and in that they were varied on only two dimensions. The dimension of interest was that of color, as it may be termed syndrome relevant. A major hypothesis, then, is that, while sorting colored and white figures in a probability matching situation, the highly ethnocentric individual will exhibit his

tendency to form a closed, rigid category, as indicated by his over-matching the frequency of a reinforcement signal. In terms of the present experiment, this means that he will indicate that all of the appropriate black figures belong in one category and that all of the white ones belong in another category, when in fact this is true less than 100% of the time.

The second dimension selected was that of mood. This variable was chosen for several reasons. Primarily, it allowed the use of four stimulus figures that did not vary greatly in perceptual characteristics. In addition, the use of the second variable increases the complexity and ambiguity of the task, thereby making it more likely that rigid categorizations will be used (Brooks, 1960). The subject's task, then, was that of assigning each of the four stimulus figures to one of two categories on the basis of a probabilistic reinforcement of their responses. The situation was made even more ambiguous by making two of the four figures neutral in that they belonged equally to both categories. To test for the effects of primary rigidity, the probabilities of reinforcement of a particular response to each of the four figures were changed without the subject's knowledge, with the expectation that the more ethnocentric subjects will persevere longer in terms of the old reinforcement probabilities (Wesley, 1953). It is

also expected that the culturally popular stereotype of the happy Negro will be over-matched especially rapidly. In addition, it is also expected that there will be a high correlation between E scale scores and scores on the short form of the Wesley rigidity scale, as has been previously found.

Hypotheses

Specifically, the following hypotheses are made with respect to the above.

- I. It is hypothesized that subjects characterized by ethnocentric attitudes will be unable to tolerate the ambiguity inherent in the complex probability matching situation used. Specifically, this leads to the following predictions regarding the performance of the high and low ethnocentrism groups across the initial 160 learning trials on those stimuli which are to be divided into two groups in a probabilistic manner:
 - a) The high ethnocentrism group will reach its asymptotic response rate faster than the low ethnocentrism group.
 - b) The high ethnocentrism group's asymptotic response rate will be higher than the input frequencies of reinforcement, while the low ethnocentrism group's asymptotic response

rate will closely match these input frequencies. If a closed category is formed, then structural rigidity may be said to be present.

- c) The high ethnocentrism group's response latencies will be lower than those of the low ethnocentrism group.

II. It is hypothesized that subjects characterized by ethnocentric attitudes will exhibit primary rigidity when the input frequencies of reinforcement are changed without their knowledge.

Specifically, this leads to the following predictions regarding the performance of the high and low ethnocentrism groups across the last 80 trials of the experiment on all four stimuli:

- a) The high ethnocentrism group will persevere longer in their asymptotic responses to cues which can no longer be discriminated into two groups on the basis of their probabilistic reinforcement, when compared with the low ethnocentrism group.
- b) The high ethnocentrism group's response latencies will continue to be lower during the initial stages of the last 80 trials, when compared with the low ethnocentrism group.

III. It is hypothesized that subjects characterized by ethnocentric attitudes will exhibit, through the frequency of their responses, certain aspects of stereotypical thinking. Specifically, this leads to the following predictions regarding the performance of the high and low ethnocentrism groups across the initial 160 learning trials:

- a) The high ethnocentrism subjects will associate the four stimulus figures used into two groups on the basis of color. Statistically, this means that if one of the colored figures belongs predominantly to a specific category, then the other colored figure will be assigned to the same category more than 50% of the time, when in actuality the second figure belongs equally to both categories.
- b) The high ethnocentrism group will respond to the popular stereotype of the happy Negro by assigning this particular figure to its appropriate category even faster than the rest of the stimulus figures.

IV. It is hypothesized that there will be a correlation between ethnocentrism and rigidity, as given by scores on the E scale and the short form of the Wesley scale, respectively.

METHOD

Stimuli

The stimuli used in this investigation were simple sketches of a male figure drawn by the investigator. Four separate figures were compiled which differed from each other only in terms of emotionality and color. Thus, the figures were depicted as being either happy or sad (determined solely by curvature of the mouth) and black or white (determined by presence or absence of shading) - see Appendix C). Each figure was photographed and duplicated on slides so that it could be shown to a group of subjects.

The subject's task was to sort a series of these stimulus figures into two groups, designated as A and B. The figures (cues) were shown on a screen for five seconds by means of an automatic slide projector, during which time the subjects made their choice, or response, by pressing one of two telegraph keys in front of them. Between successive slides the subject's response was either positively or negatively reinforced by means of two signal lights on the screen. The appropriate

reinforcing light was on for approximately one second.

Responses to the four cues were reinforced in the following manner. Both A and B responses to two of the cues, subsequently called the neutral cues, were reinforced 50% of the time. For the subject, this meant that the neutral cues were distributed equally between A and B. Consistent responses to the two remaining cues, which could be discriminated, for the most part, into groups A and B, and which are subsequently called the discrimination cues, were reinforced either 83% or 17% of the time. For example, if one of the discrimination cues was the black-sad figure, response A to this figure might be positively reinforced 83% of the time, and negatively reinforced 17% of the time. Thus, response B to the same figure would be negatively reinforced 83% of the time, and positively reinforced 17% of the time. In this case response B to the white-happy figure, the second discrimination figure, would be positively reinforced 83% of the time, and negatively reinforced 17% of the time. For the subjects this means that the black-sad figure goes mostly into group A, while the white-happy figure goes mostly into group B. To allow each cue an opportunity of being paired 83% of the time with both A and B, in order to eliminate response biases, a counter-balanced design using four separate reinforcement conditions was used. The actual percentages of reinforcement used in the present study are presented in Table 1.

Table 1

The Percentage of Positive Reinforcements to
Response A in Each of the Four Conditions
for Each of the Four Cues

	<u>BH</u>	<u>BS</u>	<u>WH</u>	<u>WS</u>
Condition 1	50	83	17	50
2	50	17	83	50
3	83	50	50	17
4	17	50	50	83

The reinforcement schedules in Table 1 were maintained over 160 stimulus trials. The discrimination cues were presented on 96 of these trials, while the neutral cues were presented on the remaining 64 trials. There were equal numbers of the two discrimination cues, as well as equal numbers of the two neutral cues. The new reinforcement schedules were instituted on trial 161 and continued for the next 80 trials, giving a total of 240 trials. This change in reinforcements was accomplished by making the neutral cues discrimination cues, and the discrimination cues neutral. Since there are two possible combinations of such a switch, the four experimental conditions were subdivided into two groups, thus yielding the final eight experimental groups. Once again the discrimination cues retained a 60% frequency of occurrence, giving 48 discrimination cues and 32 neutral cues. As in the original learning trials, there were equal numbers of the two discrimination cues, as well as equal numbers of the two neutral cues.

The order of presentation of all cues, as well as the order of reinforcements, was determined by a process of randomization. For each experimental group a deck of 40 playing cards was compiled containing the appropriate numbers of each cue paired with a specific reinforcement (i.e., an A or a B). The deck was then shuffled thoroughly and the order of the cards was recorded. If six or more

like combinations of a cue and a single reinforcement occurred, the deck was reshuffled. Also, since the 240 slides required several slide trays, the reinforcement change was not allowed to occur between two successive slide trays.

Subjects

The subjects used in this investigation were 64 undergraduate male volunteers from the University of Massachusetts. They were drawn from introductory psychology classes and received one experimental credit for their participation.

Procedure

The experiment was conducted in a large room approximately fifteen feet by twenty feet. Two eight foot long tables, one in front of the other, were located in the room and four chairs were placed at each table so that a person sitting in them would face a screen located on the farther short wall, with the table in front of him. Each table was divided into four separate doubly open-ended compartments by means of a plywood panel approximately two and a half feet high. The purpose of this was to prevent the subjects from being aware of the responses made by the adjoining subjects. Each compartment contained a moveable board located near the side of the table opposite the chair. These boards had a large "A" and "B" marked near the left and right ends, respectively. Two standard telegraph keys

were mounted on each board near to and on the inner side of either letter. Each of the 16 telegraph keys was wired to a single channel of an Esterline-Angus recorder.

The screen, a standard 40" by 40" model, was mounted close to the ceiling next to the far wall so that all subjects could see it clearly. To further insure unrestricted vision the taller subjects in each experimental group were requested to sit at the table farthest from the screen. A large eight inch by 14" white card was attached to each side of the screen near its top. At the top of each card, facing the subjects, was a 1½" grated red plastic disc, taken from a bicycle reflector. Behind each disc was a 15W bulb. The card on the left side of the screen had a five inch tall "A" below the red disc, while the card on the right had an equally sized "B" in the same position. Appearing beneath these letters was the phrase WAS CORRECT.

A modified Kodak Carousel slide projector was located across the room from the screen in the left corner of the room, i.e., left when facing the screen. The modification consisted of the addition of a microswitch designed to close during the cycle between successive slides. This switch was connected to a spare channel on the Esterline-Angus recorder, thereby allowing the stimulus onset and offset to be recorded along with the subject's responses. The Esterline-Angus recorder was located on the equipment

stand with the projector, as was a manually operated control box for the signal lights located at the top of the screen.

The subjects were run in groups of eight. After each group was seated, the experimenter read the following instructions to them:

You are going to see a series of slides on the screen in front of you. Each slide will have a sketch of a man on it. These men will differ in two characteristics: color and facial expression. When a sketch is shown on the screen you are to decide whether he belongs to side "A" or to side "B". At first you won't know, so you will have to guess. However, after seeing a number of these figures you will find that the above mentioned characteristics will help you determine which side they belong to. Sequence will not help you in your decision. You are to indicate your choice by pressing one of the two keys in front of you. Notice that they are marked A and B to correspond to your answer. Each slide will be shown on the screen for five seconds, during which time you will make your choice. Please press a key for each slide. The correct answer will be given by the two red lights on either side of the screen. If the light on the left goes on, for example, then A was the correct answer. If the one on the right, then B. These lights will be turned on between successive slides. Any questions?

After the instructions were read, the room was darkened by turning off three of the five overhead lights. The experimenter then went to the equipment table and started the Esterline-Angus recorder and the slide projector. Between slides the experimenter operated the control box for the reinforcement (correct answer) lights on the screen. The 240 stimulus slides were then shown in sequence and took approximately 20 minutes. Between the three slide

tray changes the subjects were asked to refrain from talking.

After all of the slides had been shown the lights were turned on and each subject completed a dittoed form of the E scale and the short form of the Wesley rigidity scale.

RESULTS

The two dependent measures used in this investigation were the actual A or B responses of the subjects to each cue and its latency. In order to test the central hypotheses regarding the effects of ethnocentrism, the subjects in each of the eight final treatment groups were subdivided into high and low ethnocentric groups of equal size on the basis of their E scale scores. Thus, the data from the four subjects with the highest E scale scores in a treatment group was separated from the data of the other four subjects with the lowest scores. The means and standard deviations of E scale and Wesley scores for each treatment group are presented in Table 2.

The probability matching curves were obtained by counting the number of A responses to each cue within blocks of 40 trials. The decision to use a block size of 40 trials as a unit of analysis is dictated by the fact that the same 40 trials comprised a randomization unit for due and reinforcement presentation. The decision to use the A response for frequency counts was arbitrary, as the same information could have been obtained from the B responses, although in mirrored form.

Table 2

Means and Standard Deviations of E Scale and
Wesley Scores for Each Treatment Group

	<u>E Scores</u>		<u>Wesley Scores</u>	
	Mean	S.D.	Mean	S.D.
Group 1	44.8	14.1	4.4	1.7
Group 2	50.6	15.5	4.1	1.5
Group 3	43.5	12.0	3.1	1.4
Group 4	49.8	10.2	3.9	2.5
Group 5	47.1	10.4	4.1	2.2
Group 6	44.2	7.9	4.0	1.4
Group 7	47.9	9.5	4.6	1.6
Group 8	48.6	19.2	4.5	1.5

To test the hypothesis that the ethnocentric individual uses more closed categorizations and that he will over-match the input frequencies of the reinforcements of A and B responses, a mixed design analysis of variance was carried out on the frequency of A responses to the differentially reinforced discrimination cues across all four experimental conditions, over trials 1-160. Table 3 presents this analysis of variance. The discrimination cues associated with an 83% reinforcement of response A have been separated from those cues associated with a 17% reinforcement of response A, and have been treated as a within subjects variable. The performance of the high and low ethnocentrism groups over trials 1-160 is presented in Figure 1. The significant ethnocentrism by cue interaction ($F=6.16, p < .025$) indicates that the low ethnocentrism subjects were able to approximate the reinforcement probabilities more closely than were the highly ethnocentric subjects. Accordingly, the low ethnocentrism subjects were assigning A responses to the 83% and 17% positive reinforcement cues approximately 78% and 19% of the time, respectively, while the highly ethnocentric subjects were assigning A responses to the same cues approximately 75% and 28% of the time. Thus, hypothesis Ib, which predicted that the highly ethnocentric subjects would consistently over-match the reinforcement probabilities, when compared with the low ethnocentrism

Table 3

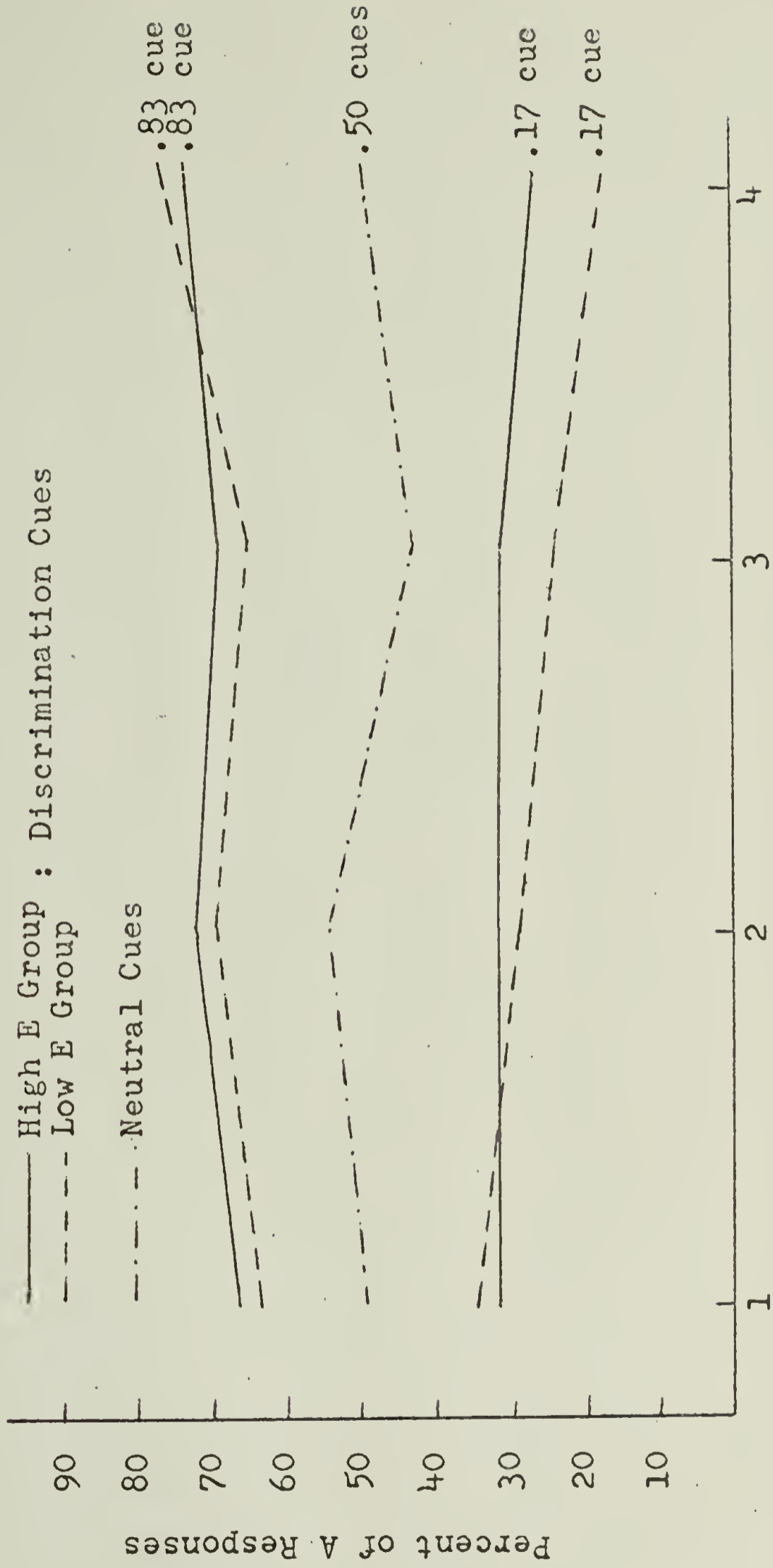
Mixed Analysis of Variance of A Responses to
Discrimination Cues on Trials 1-160

Sources	<u>df</u>	<u>MS</u>	<u>F</u>
Between	63		
Ethnocentrism (E)	1	1.01	
Condition (C)	3	8.04	1.98
E x C	3	5.12	1.26
<u>Ss/EC</u>	56	4.06	
Within	448		
Trials	3	1.67	1.04
Trials x E	3	3.67	2.29
Trials x C	9	1.89	1.18
Trials x E x C	9	1.78	1.11
Trials x <u>Ss/E</u> x C	168	1.60	
Cue	1	3022.61	846.49*
Cue x E	1	22.12	6.16**
Cue x C	3	78.67	22.04*
Cue x E x C	3	9.05	2.53
Cue x <u>Ss/E</u> x C	56	3.57	
Trials x Cue	3	28.00	3.80**
Trials x Cue x E	3	3.67	
Trials x Cue x C	9	11.11	1.46
Trials x Cue x E x C	9	7.33	
Trials x Cue x <u>Ss/E</u> x C	168	7.63	

*p < .001
**p < .025

Figure 1

Percentage of A Responses as a Function of Trials 1 - 160



BLOCKS OF 40 TRIALS

subjects, was not confirmed. In addition, the lack of significant trials by ethnocentrism interaction indicates that hypothesis Ia, which predicted that the highly ethnocentric subjects would structure the situation more rapidly, as reflected by the quicker attainment of asymptotic responding, was not confirmed. However, the test of hypothesis Ia may be partially confounded by the fact that neither group of subjects (the high and low ethnocentrism groups) seemed to be responding at asymptote at the end of the 160 learning trials, as suggested by an inspection of the learning curves presented in Figure 1. Hypothesis IIIb, which predicts an effect from the common stereotype of the happy Negro in the high ethnocentrism subjects, statistically predicts that, when the black-happy due is a discrimination cue, as it is in experimental conditions three and four, the high ethnocentrism subjects will over-match it, when compared to the rest of the cues when they are discrimination cues. Thus, this prediction is tested by the ethnocentrism by condition by due interaction, which is not significant. Accordingly, hypothesis IIIb is not confirmed.

To determine the nature of the probability learning curve across all of the discrimination cues, a trend analysis was carried out on the responses to the discrimination cues across trials 1-160 for all of the subjects. Because of the counterbalanced nature of the design, either

response A or response B could be correct for a given cue, depending on the experimental condition under consideration. Thus, in order to get a composite trials effect across all of the discrimination cues, the number of A responses, when B was reinforced 85% of the time, was subtracted from 12, the maximum number of responses possible. This subtraction serves to make all of the curves trend in the same direction. Of the 89.96 units of variance attributable to trials (obtained from a separate analysis of variance; see Appendix D), 78.40 units or 87% was linear. The F ratio for the linear trend was 18.48 and was significant at the .001 level. The quadratic and cubic components were not significant.

To test the hypothesis that increasing ethnocentrism disposes an individual toward an association between the four cues on the basis of color, the subject's A responses to the neutral cues over the first 160 trials were analyzed via the same mixed design. In this case, however, the "cues" variable represents a division of the two neutral cues on the basis of a color association. For example, if an A response to the black-sad cue was reinforced 83% of the time, then the black-happy cue responses would constitute one level of the neutral cues variable. Alternatively, the A responses to the white-sad cue would represent the other level of the cues variable. In the first case,

generalization of the A response is on the basis of color, while in the second case, generalization would be on the basis of mood. The results of this analysis are presented in Table 4. Hypothesis IIIa is not confirmed, as evidenced by the nonsignificance of both the cue effect and the ethnocentrism by cue interaction. Thus, there is no evidence for a differential generalization of responses on the basis of color or mood for either the high or low ethnocentric groups. A trend analysis was carried out on the significant trials effect. Of the 39.35 units of variance attributable to trials, 32.18 units or 82% was cubic. The F ratio for the cubic component was 19.86 and was significant at the .001 level. The linear and quadratic components were not significant. The trials variable for the neutral cues has also been plotted in Figure 1. It shows that the subjects were able to closely match the 50% reinforcement schedules given these neutral cues. The possible interpretations of the unpredicted cubic component of the trials variable will be covered in the discussion section.

The latencies of the subject's responses to both the discrimination and the neutral cues, over the first 160 trials, were also analyzed by the same mixed design, only in this case they were averaged over blocks of 20 trials. These latencies were obtained by measuring the distance

Table 4

Mixed Analysis of Variance of A Responses to
Neutral Cues on Trials 1-160

Sources	<u>df</u>	<u>MS</u>	<u>F</u>
Between	63		
Ethnocentrism (E)	1	.56	
Condition (C)	3	.74	
E x C	3	1.84	
<u>Ss</u> /E x C	56	2.28	
Within	448		
Cue	1	4.72	
Cue x E	1	.78	
Cue x C	3	146.53	14.28*
Cue x E x C	3	17.40	1.69
Cue x <u>Ss</u> /E x C	56	10.26	
Trials	3	13.12	8.10*
Trials x E	3	.16	
Trials x C	9	4.22	2.60**
Trials x E x C	9	1.86	1.15
Trials x <u>Ss</u> /E x C	168	1.62	
Cue x Trials	3	2.36	
Cue x Trials x E	3	.99	
Cue x Trials x C	9	3.43	1.44
Cue x Trials x E x C	9	1.34	
Cue x Trials x <u>Ss</u> /E x C	168	2.38	

*p < .001

**p < .005

between the stimulus onset and each response as they were recorded on the Esterline-Angus recording paper. To minimize error of measurement the recording speed of the recording paper was set at the machine's upper limit. During the measurement, the latency of each response was rounded off to the nearest half second. To test for skewness of this data a plot of 100 randomly selected individual latencies was inspected and found to be almost normally distributed. Accordingly, the data was not transformed prior to the analysis. Table 5 presents this analysis of variance. Hypothesis Ic, which predicts that increased ethnocentrism disposes an individual toward faster closure in an ambiguous situation, as measured by reaction time, is tested by either the ethnocentrism by cues interaction or the ethnocentrism by trials interaction. Accordingly, this hypothesis is not confirmed. A trend analysis was carried out on the trials variable. Of the 123.49 units of variance attributable to trials, 103.50 or 85% was negatively linear. The F ratio for this decreasing linear trend was 241.82, which is significant at the .001 level.

The remaining 80 trials of the experiment were analyzed in a similar manner. However, in order to gain a more accurate picture of the nature of the probability matching curves, the A responses were totalled separately for each half of the total number of cues presented within a block

Mixed Analysis of Variance of Latencies
to All Cues on Trials 1-160

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Between	63		
Condition (C)	3	3.289	
Ethnocentrism (E)	1	2.933	
C x E	3	2.995	
<u>Ss/C</u> x E	56	5.183	
Within	1984		
Trials	7	17.641	41.23*
Trials x C	21	.552	1.29
Trials x E	7	.166	
Trials x C x E	21	.181	
Trials x <u>Ss/C</u> x E	392	.428	
Cues	3	.859	4.27***
Cues x C	9	.347	2.73
Cues x E	3	.265	1.33
Cues x C x E	9	.151	
Cues x <u>Ss/C</u> x E	168	.201	
Trials x Cues	21	.258	1.74**
Trials x Cues x C	63	.299	2.02*
Trials x Cues x E	21	.111	
Trials x Cues x C x E	63	.146	
Trials x Cues x <u>Ss/C</u> x E	1176	.148	

*p < .001

**p < .025

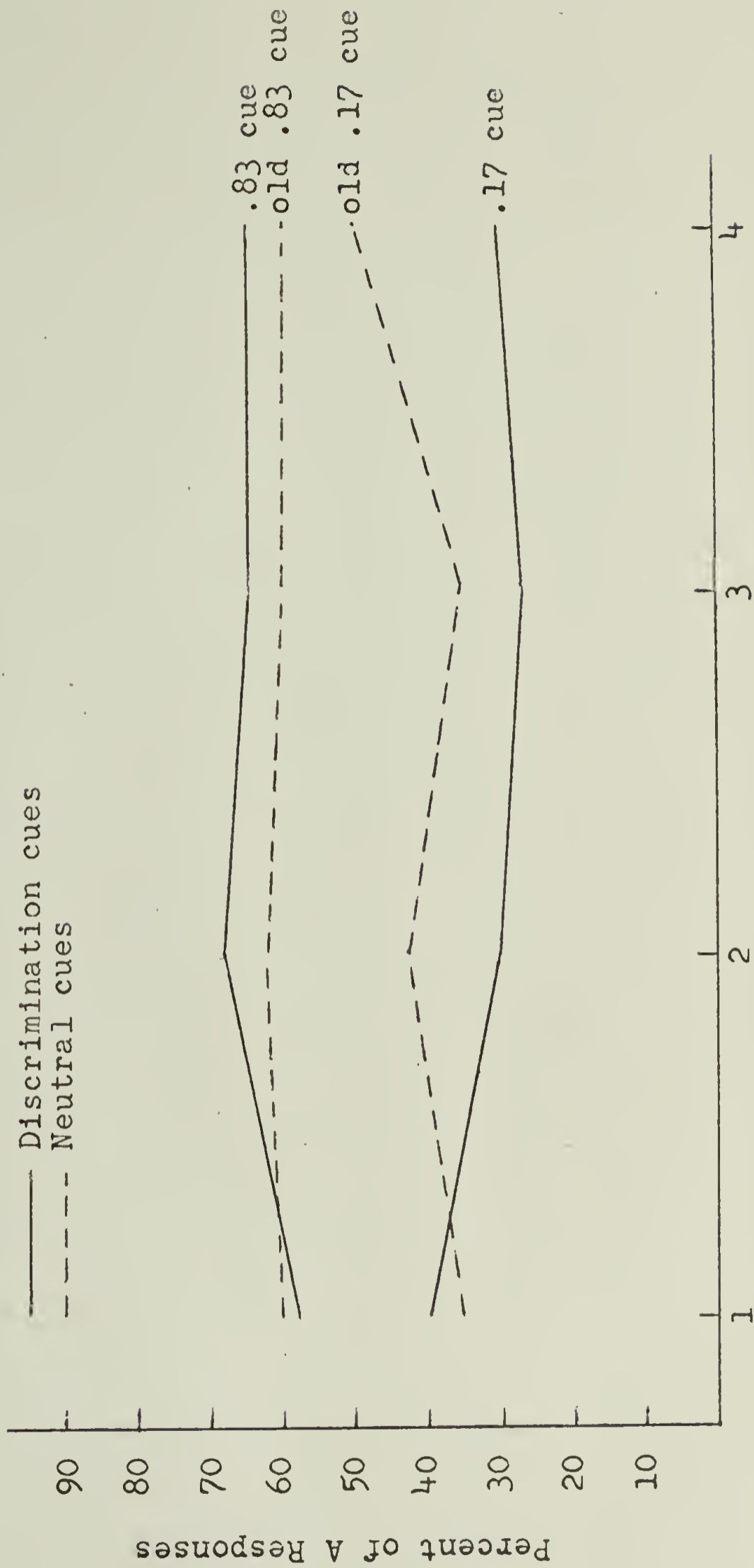
***p < .01

of 40 trials, giving four levels of the trials variable. These probability matching curves are presented in Figure 2. Table 6 presents the results of the analysis of the new discrimination cues and Table 7 presents the results of the analysis of the new neutral cues. In both tables the "cues" variable represents a division of the subject's A responses into those whose frequency should increase and those whose frequency should decrease, as dictated by the new reinforcement schedules. The significant trials by cues interaction in Table 6 ($F=9.24$, $p<.001$) indicates that the subjects were starting to learn the 83% and 17% reinforcement schedules associated with the new discrimination cues. Hypothesis IIa, which predicts that the highly ethnocentric subjects will persevere longer in their previously learned response patterns, is tested by the ethnocentrism by cues interaction and the ethnocentrism by cues by trials interaction in both Tables 6 and 7. This hypothesis is not supported, as in neither case is this interaction significant.

To test hypothesis IIb, which predicted that the high ethnocentrism group's response latencies would continue to be lower during the initial trials of the last 80 trials of the experiment, when compared with the low ethnocentrism group's latencies, a similar mixed design analysis of variance was carried out on these latencies. The results

FIGURE 2

Percentage of A Responses as
a Function of Trials 161-240



BLOCKS OF 20 TRIALS

Table 6

Mixed Analysis of Variance of A Responses to
Discrimination Cues on Trials 161-240

Source	df	MS	F
Between	63		
Ethnocentrism (E)	1	2.40	2.18
Conditions (C)	3	4.27	3.88**
E x C	3	1.03	
<u>Ss</u> /E x C	56	1.10	
Within	448		
Cue	1	498.10	78.30*
Cue x E	1	.40	
Cue x C	3	24.14	3.80**
Cue x E x C	3	5.81	
Cue x <u>Ss</u> /E x C	56	6.36	
Trials	3	1.25	
Trials x E	3	2.32	1.60
Trials x C	9	1.72	1.19
Trials x E x C	9	2.09	1.44
Trials x <u>Ss</u> /E x C	168	1.45	
Cue x Trials	3	12.57	9.24*
Cue x Trials x E	3	2.46	1.81
Cue x Trials x C	9	5.84	4.29*
Cue x Trials x E x C	9	1.75	1.28
Cue x Trials x <u>Ss</u> /E x C	168	1.36	

*p < .001

**p < .025

Table 7

Mixed Analysis of Variance of A Responses to
Neutral Cues on Trials 161-240

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Between	63		
Ethnocentrism (E)	1	0.00	
Condition (C)	3	3.80	3.04*
E x C	3	.10	
S/E x C	56	1.25	
Within	448		
Cues	1	87.78	24.25**
Cues x E	1	4.88	1.32
Cues x C	3	1.69	
Cues x E x C	3	2.55	
Cues x <u>Ss</u> /E x C	56	3.62	
Trials	3	1.78	2.40
Trials x E	3	.07	
Trials x C	9	2.16	3.00**
Trials x E x C	9	.87	1.21
Trials x <u>Ss</u> /E x C	168	.72	
Cues x Trials	3	2.16	2.60
Cues x Trials x E	3	1.79	2.16
Cues x Trials x C	9	1.11	1.34
Cues x Trials x E x C	9	1.11	1.34
Cues x Trials x <u>Ss</u> /E x C	168	.83	

*p < .05

**p < .001

Table 8

Mixed Analysis of Variance of Latencies
to All Cues on Trials 161-240

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Between	63		
Conditions (C)	7	2.66	
Ethnocentrism (E)	1	.99	
C x E	7	1.38	
<u>Ss/C</u> x E	48	3.21	
Within	960		
Trials	3	1.17	4.18**
Trials x C	21	.29	1.04
Trials x E	3	.02	
Trials x C x E	21	.15	
Trials x <u>Ss/C</u> x E	144	.28	
Cues	3	.92	6.13*
Cues x C	21	.27	1.80
Cues x E	3	.03	
Cues x C x E	21	.11	
Cues x <u>Ss/C</u> x E	144	.15	
Trials x Cues	9	.09	
Trials x Cues x C	63	.22	2.20
Trials x Cues x E	9	.06	
Trials x Cues x C x E	63	.09	
Trials x Cues x <u>Ss/C</u> x E	432	.10	

*p < .001

**p < .01

of this analysis are presented in Table 8. Hypothesis IIb is tested by either the ethnocentrism variable or the ethnocentrism by trials interaction. Inspection of this analysis of variance table indicates that neither of these effects were significant, and thus hypothesis IIb was not supported. A trend analysis was carried out on the significant trials effect ($F=4.18$, $p<.01$). Of the 3.52 units of variance attributable to trials, 1.99 units or 56% was negatively linear. The F ratio for this decreasing linear component was 7.10 and was significant at the .01 level. The cubic trend contributed 1.52 units of variance and yielded an F ratio of 5.57, which was significant at the .025 level.

Hypothesis IV was tested by taking a Pearson product-moment correlation between the subject's E scale scores and their scores on the short form of the Wesley rigidity scale. The obtained correlation of .16 does not support a generalized rigidity hypothesis nor does it replicate the previously reported correlation of .38 (Zelen and Levitt, 1954).

DISCUSSION

The long-standing contention that individuals characterized by ethnocentric ideology are predisposed toward rigidity in their cognitive functioning does not appear to have been supported in the present investigation. Rigidity, as indicated by scores on the short form of the Wesley rigidity scale, was found to be correlated .16 with E scale scores. This finding does not replicate a previously reported correlation between these scales of .38 (Zelen and Levitt, 1954). Specific hypotheses made concerning the possible effects of both primary and secondary rigidity have not been confirmed. These findings are consistent with most of the previously reported research in this area, with the possible exception of the work of Frenkel-Brunswick (1948, 1949) and Rokeach (1948).

It has also been hypothesized and demonstrated by previous investigators that individuals characterized by ethnocentric ideology are especially intolerant of ambiguity. Specific hypotheses made concerning this inability to tolerate ambiguity have not been confirmed in the present investigation. Thus, the previously reported findings that

highly ethnocentric individuals structure ambiguous situations more rapidly than subjects low in ethnocentric ideology were not replicated in either of the two measures used in the present probability matching paradigm.

The results have demonstrated that subjects can learn to probability match the frequency of occurrence or signal lights to a number of separate, but related, stimuli in a relatively complex learning situation. Such learning, however, seems to have been very gradual, for at the end of 48 discrimination cue trials neither group of subjects appeared to be responding at asymptote. This failure to reach asymptotic responding may be partially a function of the brevity of the intertrial interval, which was possibly too short for the subjects to fully integrate their responses with the signal light reinforcement schedules. The one second interval used was dictated by the type of slide projector available at the time of the study, rather than by theoretical considerations.

An examination of Figure 1 and the significant ethnocentrism by cues interaction in Table 3 reveals that increased ethnocentrism did have one major effect in the probability matching situation used in the present study; that of retarding an accurate probability match. Consequently, by the end of the first 160 trials of the experiment the low ethnocentrism group had almost approximated the input frequencies of the reinforcement of response A to the

discrimination stimuli, whereas the high ethnocentrism group's response rates were further from these input frequencies. In the case of either group, the linearly decreasing latencies and the lack of a significant ethnocentrism by trials interaction in the analysis of the latency data (Table 5), seems to indicate that the decision to respond became increasingly conflict-free for both groups at the same rate. An inspection of the ethnocentrism by trials interaction and the linearly decreasing trials effect in Table 8 reveals that these findings were replicated after the reinforcement probabilities were altered. The significant cubic component of the same trials variable in Table 8 suggests that, as the subjects became aware of the reinforcement changes, they were temporarily more unsure of their responses.

The unexpected significant cubic component of the frequency of an A response to the neutral stimuli across the first 160 trials of the experiment (Table 4) cannot be accounted for by the literature reviewed. It is possible that the data reveals a "hunting" phenomena of some sort. This phenomena may have been caused by the nature of the stimuli, as similar fluctuations across trials have not been reported in the previous studies using 50% reinforcement schedules to stimuli such as lights.

To test for the possibility that intelligence may be

more of a factor in making an accurate probability match than ethnocentrism, in a situation such as the present one, accuracy scores were derived for each subject by taking the difference between the actual number of A responses to the discrimination cues associated with A and the "ideal" number of A responses across the first 160 trials. Similar scores were obtained for the discrimination cues associated with B and the two were added together to yield a final accuracy score. Two groups of 15 subjects were selected on the basis of their accuracy scores, those who matched most accurately and those who matched most inaccurately. A X^2 analysis was performed on the observed number of subjects having high and low SAT scores, and was found to be nonsignificant ($X^2=2.63$). The possibility that intelligence may have been a factor was also tested by correlating the subject's SAT scores with their accuracy scores, after they had been dichotomized on the rigidity measure. The obtained correlations were $-.09$ and $-.11$. Accordingly, intelligence does not seem to have been a major factor in the formation of an accurate probability match.

Several speculations may be made concerning the failure of the high ethnocentrism group to structure the situation more quickly and more rigidly as far as the discrimination cues are concerned. One possibility lies in the 83% reinforcement rate used. This percentage was selected

arbitrarily and without previous knowledge of the exact types of probability matching obtained with differing frequencies of reinforcement. It is possible that any subject will form a closed categorization, or select one response 100% of the time, if the reinforcement frequencies are high enough. It therefore seems reasonable to assume that the presently used frequency of 83% was not close enough to a 100% rate for the subjects, ethnocentric or not, to form a closed categorization by assigning the discrimination cues exclusively to one category or another. This means that the necessary 17% violation of reality was too much to demand. These considerations suggest that the types of probability matching obtained with differing frequencies or reinforcement is an area to be yet explored.

A second possibility may lie in the nature of the instructions used. Had the instructions been "humanized" more, the subjects might have thought about the task more in terms of Negroes and whites, rather than simply about conceptual cues. Accordingly, in terms of social learning and the formation of stereotypes, it is likely that the breaking point between some sort of probability match and the formation of a rigid categorization, with its attendant distortion of reality, is a function of several variables, including the amount of ethnocentric ideology, temporary sets, the syndrome relevance of the stimuli used (White,

1965), the actual percentages of reinforcement used and the amount of threat inherent in the discrimination situation (Brown, 1953; Applezweig, 1954).

The failure to confirm hypotheses IIIa and IIIb may lie in both the instructions used and in the nature of the present stimuli. It is likely that the drawings used were not close enough to real life representations of people to be termed truly syndrome relevant, in the sense that ethnocentric ideology could play a part in the formation of the predicted categorizations. However, it is possible that in a recall situation in which the subjects would be asked to describe the figures belonging to side A and side B that stereotypy might become evident. Results such as these would be similar to the findings of Solley and Messick (1957) that subjects, when asked to describe the most typical member or one of their "tribes" of stickmen, gave the most frequently occurring combination of characteristics, in spite of the fact that this combination appeared only 40% of the time.

In addition, the failure to find significant differences between the two ethnocentrism groups in the directions predicted may also be thought to be a function of the small average 40 point range of E scores within each experimental group. Yet, a simple analysis of variance carried out on the A responses of the 16 most extreme E scale subjects

reveals trends similar to those already noted. (See Appendix, Table 10).

Previous research seems rather consistent in its findings that rigid subjects persevere longer in learned response patterns when these patterns are no longer correct (Wesley, 1963; Frenkel-Brunswick, 1949). A X^2 analysis of the relationship between behavioral rigidity, as measured by the perseveration of A responses after the reinforcement probabilities were changed, and Wesley rigidity failed to replicate these findings. In addition, the present study failed to demonstrate a relationship between ethnocentric ideology and behavioral rigidity, as measured by the perseveration of learned response patterns. This lack of a significant correlation between behavioral rigidity and both Wesley rigidity and ethnocentric ideology may be seen as consistent with the low correlation of .16 found between the E scale and the Wesley rigidity scale.

In light of the present findings, and a considerable amount of research, it seems possible that the E scale used has not provided a theoretically reasonable division of the subjects for the purposes of the present research. The presence of acquiescent response sets in the F scale has been noted repeatedly by past investigators, and for these reasons it was not used in the present study. Instead, the E scale was selected, primarily on the basis of the finding

of Chapman and Campbell (1959) that it is freer of acquiescence bias than the F scale. However, Peabody (1966) has demonstrated that all of the so-called authoritarianism scales developed by Adorno, et al. (1950) violate certain principles of test construction which render them particularly susceptible to response bias. These considerations suggest that some of the reported correlations between various indices of rigidity and the E scale may be due to a generalization of response sets, and that the phenomenon of rigidity may be more suitably investigated via an examination of response sets.

SUMMARY

Sixty four volunteer male undergraduate students at the University of Massachusetts were used as subjects to investigate the effects of ethnocentrism, rigidity and intolerance of ambiguity in a probability matching situation. The main purpose of the investigation was to note whether or not ethnocentrism plays a role in stereotype formation in a probability matching situation involving cues which may be called social in nature.

The subjects were asked to view a series of drawings of men who differed in terms of color and emotion. The four crude figures used were either black or white and either happy or sad. The subject's task was to sort these figures into two categories while they were being shown on a screen. After each drawing was shown on the screen the correct choice was indicated by means of a signal light.

Four separate counterbalanced experimental conditions were used, allowing each of the four cues to be associated with each of the four categories. In each condition two cues, the neutral cues, belonged equally to both categories, while the remaining two cues, the discrimination cues,

belonged, mutually exclusively, to either one or the other category 83% of the time it was shown on the screen. It was hypothesized that the more ethnocentric subjects would form a closed category by over-matching the 83% reinforcement rate. This hypothesis was not confirmed. It was also hypothesized that the more ethnocentric subjects would structure this somewhat complex learning situation more rapidly. This hypothesis was not confirmed. It was also hypothesized that there would be an association between the four cues on the basis of color for the ethnocentric subjects. This hypothesis was also not confirmed.

At the end of 160 stimulus trials of the experiment the reinforcement probabilities were altered for an additional 80 trials. This was accomplished by making the neutral cues discrimination cues and the discrimination cues neutral. Since this could be done in either of two ways, two sets of presentations were compiled for each of the four original stimulus presentation conditions, yielding a total of eight experimental groups. It was hypothesized that the more ethnocentric subjects would persevere longer in their response patterns and that their response latencies would continue to be lower. Neither hypothesis was confirmed.

Several speculations were made concerning the failure to get significant results and implications for further research were set forth.

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APPENDICES

APPENDIX A

The modified ethnocentrism scale used in
the present experiment

The following statements refer to opinions regarding a number of social groups and issues, about which some people agree and others disagree. Please mark each statement in the left-hand margin according to your agreement or disagreement, as follows:

+1: Slight support, agreement	-1: Slight opposition, agreement
+2: Moderate support, "	-2: Moderate opposition, "
+3: Strong support, "	-3: Strong opposition, "

- _____ 1. One trouble with Jewish businessmen is that they stick together and prevent other people from having a fair chance in competition.
- _____ 2. Negroes have their rights, but it is best to keep them in their own districts and schools and to prevent too much contact with whites.
- _____ 3. America may not be perfect, but the American way has brought us about as close as human beings can come to a perfect society.
- _____ 4. Manual labor and unskilled jobs seem to fit the Negro mentality and ability better than more skilled or responsible work.
- _____ 5. To end prejudice against Jews, the first step is for the Jews to try sincerely to get rid of their harmful and irritating faults.
- _____ 6. Certain religious sects who refuse to salute the flag should be forced to conform to such a patriotic action, or else be abolished.
- _____ 7. Negro musicians may sometimes be as good as white musicians, but it is a mistake to have mixed Negro-white bands.
- _____ 8. Most Negroes would become overbearing and disagreeable if not kept in their place.

- _____ 9. There is something different and strange about Jews; it's hard to tell what they are thinking and planning, and what makes them tick.
- _____ 10. The worst danger to real Americanism during the last 50 years has come from foreign ideas and agitators.
- _____ 11. There may be a few exceptions, but in general Jews are pretty much alike.
- _____ 12. It would be a mistake ever to have Negroes for foremen and leaders over whites.
- _____ 13. The trouble with letting Jews into a nice neighborhood is that they gradually give it a typical Jewish atmosphere.
- _____ 14. It is only natural and right for each person to think that his family is better than any other.
- _____ 15. The best guarantee of our national security is for America to have the biggest army, navy and atomic arsenal.
- _____ 16. I can hardly imagine myself marrying a Jew.
- _____ 17. Filipinos are all right in their places, but they carry it too far when they dress lavishly and go around with white girls.
- _____ 18. The people who raise all the talk about putting Negroes on the same level as whites are mostly radical agitators trying to stir up conflicts.
- _____ 19. As long as America is in the United Nations, she must be sure that she loses none of her independence and complete power as a sovereign nation.

APPENDIX B

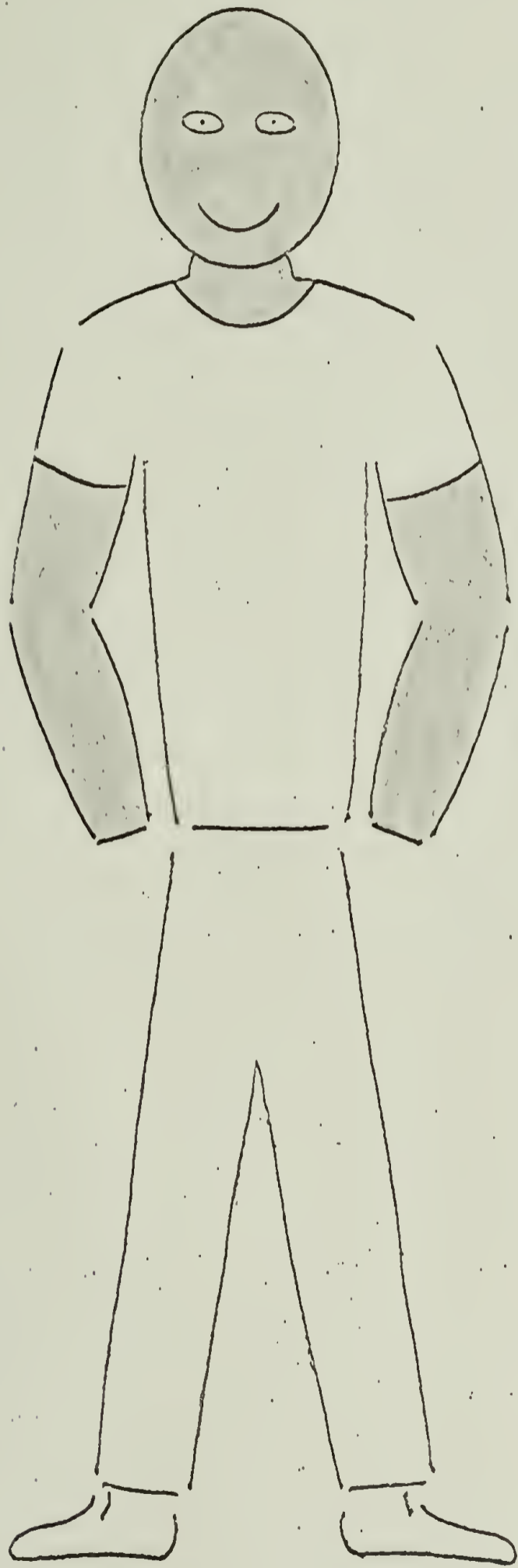
The Wesley Rigidity Scale

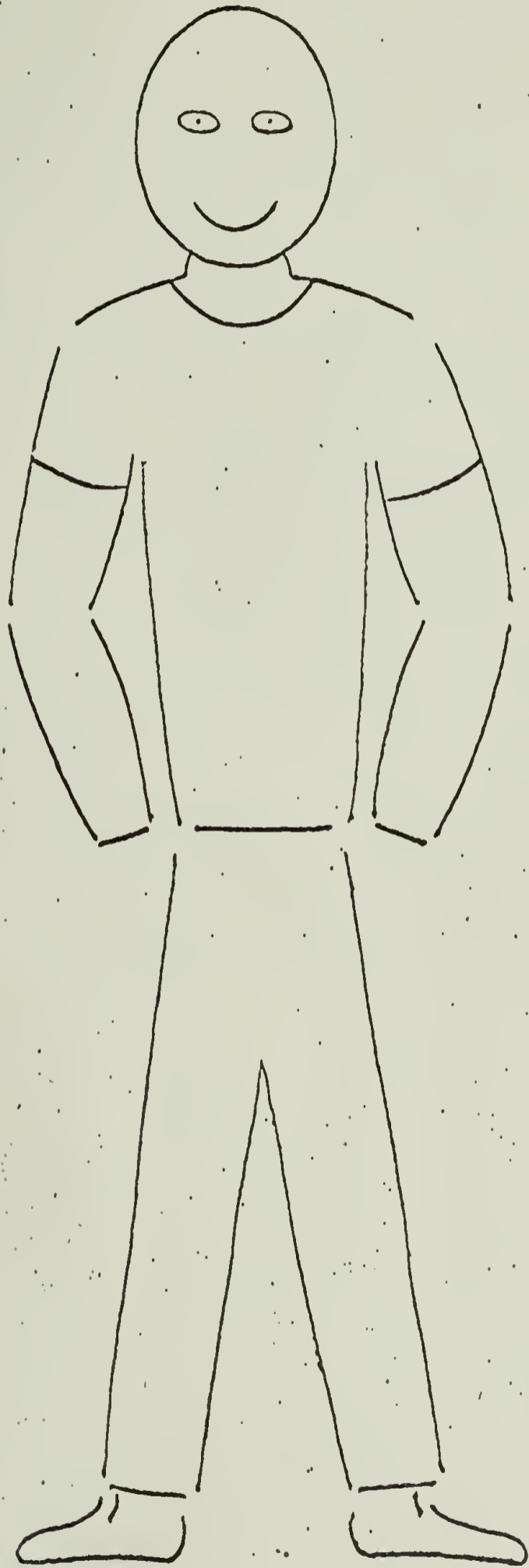
Please check the following items in the A column if you agree and in the B column if you disagree with them.

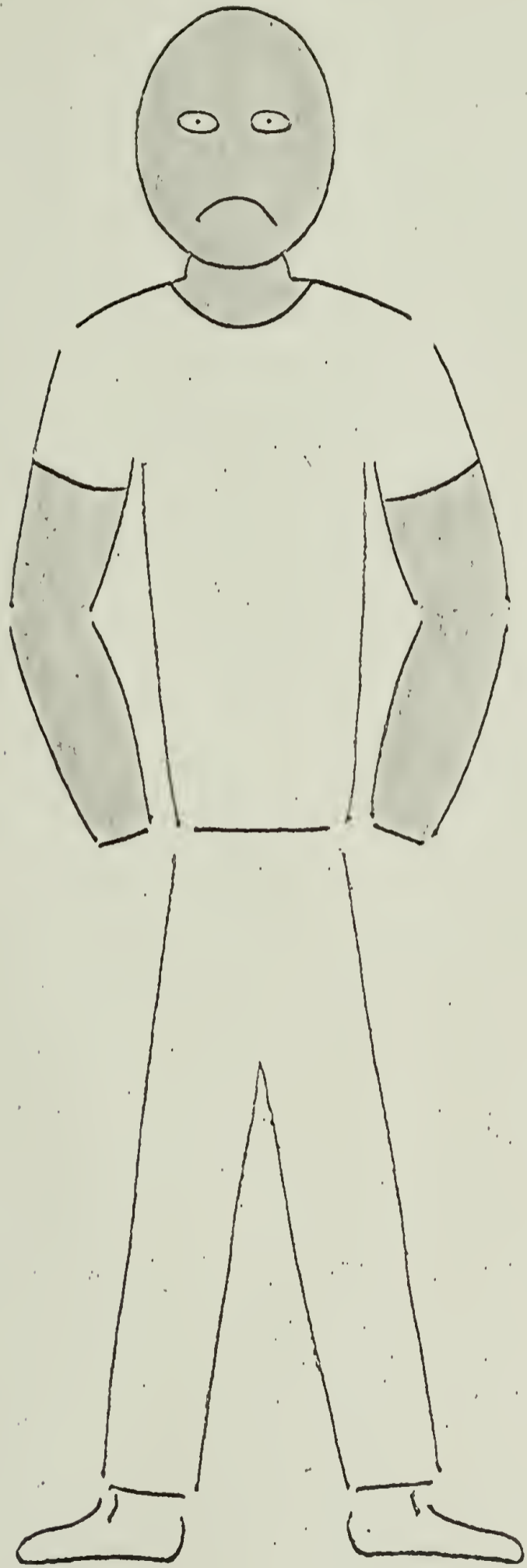
- | A | B | |
|-----|-----|---|
| ___ | ___ | 1. I am often the last one to give up trying to do a thing. |
| ___ | ___ | 2. There is usually only one best way to solve most problems. |
| ___ | ___ | 3. I dislike to change my plans in the midst of an undertaking. |
| ___ | ___ | 4. I never miss going to church. |
| ___ | ___ | 5. I would like a position which requires frequent changes from one kind of task to another. |
| ___ | ___ | 6. I do not enjoy having to adapt myself to new ways of doing things. |
| ___ | ___ | 7. My intentions tend to change quickly. |
| ___ | ___ | 8. I am always on the lookout for different ways of doing things. |
| ___ | ___ | 9. I always finish tasks I start, even if they are not very important. |
| ___ | ___ | 10. When I have undertaken a task, I find it difficult to set it aside, even for a short time. |
| ___ | ___ | 11. I like to surprise my friends by unexpected actions. |
| ___ | ___ | 12. I find it difficult to change my way of doing something even though it may not be successful. |

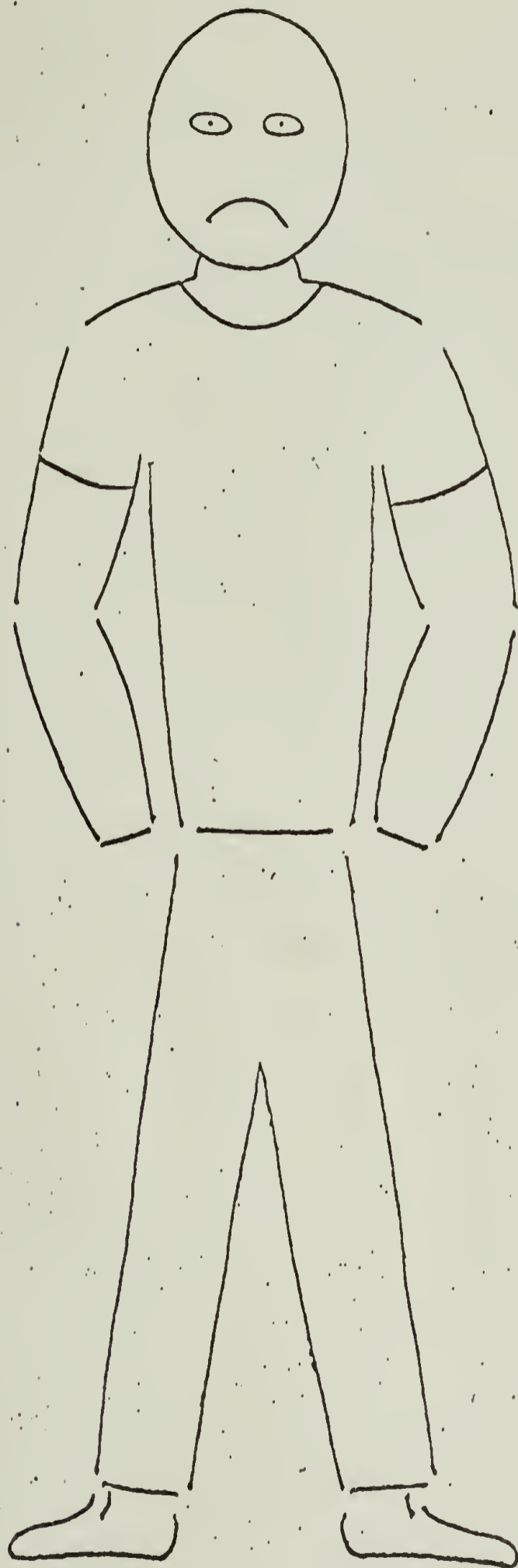
APPENDIX C

Stimulus Figures Used in the Present Experiment









APPENDIX D

Additional Analysis of Variance Tables
Mentioned in the Present Study

Table 9

Mixed Analysis of Variance for Discrimination
Cues on Trials 1-160 (Reciprocal Data)

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Between	127	1288.680		
Ethnocentrism (E)	1	24.500	24.50	2.42
Cues	3	27.834	9.28	
Cues x E	3	13.534	4.51	
Subjects/Cues x E	120	1212.812	10.11	
Within	384	1369.000		
Trials	3	89.961	26.65	7.85*
Trials x E	3	12.062	4.02	1.18
Trials x Cues	9	37.573	4.40	1.29
Trials x E x Cues	9	7.091	.79	
<u>Ss</u> x Trials/Cues x E	360	1222.313	3.40	

*p < .001

Table 10
 Mixed Analysis of Variance on Discrimination Cues
 for Extreme Groups (Reciprocal Data)

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Between	31	363.242		
Ethnocentrism (E)	1	70.508	70.51	7.22*
<u>Ss/E</u>	30	292.734	9.76	
Within	96	311.508		
Trials	3	50.961	16.99	5.94**
Trials x E	3	3.086	1.03	
<u>Ss/Trials x E</u>	90	257.461	2.86	

*p < .025

**p < .005

Approved by:

Robert H. Harrison

Samuel Himmelstein

Date: August 17, 1966

