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## Relational Judgments as a Function of "Objective Reality," General Attitudinal Structures, and Trait Content as Represented by a Structural and Discriminal Model for Determining Judgmental Tendencies

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Relational Judgments as a Function of "Objective  
Reality," General Attitudinal Structures,  
and Trait Content as Represented by a  
Structural and Discriminal Model  
for Determining Judgmental  
Tendencies

by

David J. Marx

A Dissertation Submitted to the Faculty of the  
Graduate School of Loyola University in  
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## Vita

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## Abstract

The primary purpose of this project was to determine whether there is a significant relationship between attitudinal structure and the formation of relational judgments, and whether Bock's model could be utilized to represent the various processes involved in this type of cognitive activity. Specifically, this study tested the effect of racial attitudes on estimates of relationship between positive and negative traits within a Black and White stimulus population. A 3 X 3 X 3 factorial design was employed with three levels of attitude (pro-White, middle, pro-Black), three different polar traits attributed to members of the stimulus population (clean-dirty, lazy-hardworking, violent-nonviolent), and three different distributions of these traits within the stimulus population (equality in all conditions, White superior condition, Black superior condition). The task of the subject was to estimate the degree of relationship (or correlation) between being Black or White and possessing positive or negative traits in the stimulus population previously viewed. Four estimates were acquired from each subject which were then standardized to compensate for the various experimental conditions.

After determining the appropriateness of Bock's model through a structural analysis, these four estimates were then

combined in four different ways to acquire the necessary contrast variables or dependent measures for further analysis. These four variables were: (A) the accuracy indicator; (B) absolute-White bias; (C) positive-trait bias; and (D) pro-White bias. The prediction that highly prejudiced subjects would overestimate both White positive and Black negative traits and underestimate Black positive and White negative traits was substantiated. Thus attitude was a significant factor in forming judgments; while for meaningful stimuli, relative magnitude had only minimal effects. The results further signified that future research cannot assume preference for one's own group/race in relation to another group/race and that additional analysis is required to fully explain number estimations. It was also recommended that future conceptualizations of attitude change be expanded to include additional dimensions and that further experimentation is required to determine the complete utilization of the Bock model.

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Reality," General Attitudinal Structures,  
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According to Smedslund (1963), the concept of correlation may be visualized as the ratio of the sum of two diagonal cell frequencies in a fourfold table as contrasted with the sum of the other two diagonal cell frequencies. Correlation involves the implicit classification of elements as conforming or not conforming to an inherent hypothesis of equivalence ( $A = B$ ) where both elements are either present or absent. In order to perform this operation, any individual must recognize that the two diagonal frequencies of ( $A, B$ ) and ( $-A, -B$ ) support the basic hypothesis of  $A = B$  but in opposite directions. The individual should also realize that the other two diagonal frequencies of ( $-A, B$ ) and ( $A, -B$ ) are reciprocally related and substantiate the negation of

the hypothesis that  $A = B$ . In the case of a negative correlation, the frequency indicating this latter situation (i.e. that A is present and B is absent or vice versa) is higher than the frequency of the first illustration (i.e.  $A = B$ ).

Applying this information, Smedslund attempted to determine whether normal adults possess a concept of correlation. He reasoned that a necessary and sufficient individual characteristic for inferring the presence of this capability is the person's accurate judgments of the presence and absence of correlation, accurate rankings of varied material, and self explanation of one's own judgments. Specifically, he analyzed the subject's inferences of degree of relationships by utilizing stimuli which emphasized two different yet possibly related dimensions. In his initial study, these two dimensions were a "symptom" and a "diagnosis." Each subject viewed 100 cards, each containing one of five possible "symptoms" (A, B, C, D, E) in combination with one of four possible "diagnoses" (F, G, H, I). His task was to concentrate solely on the occurrences of symptom A and diagnosis F and to form an impression of the extent to which A might be a useful symptom in the diagnosis of F. He was then to indicate the strength of the relationship on a seven-point scale. The absolute frequencies of this relationship were varied according to one of five frequency distributions:

	-A	A	-A	A	-A	A	-A	A	-A	A
F	35	35	15	15	15	35	35	15	25	25
-F	15	15	35	35	35	15	15	35	25	25

The general, over-all results indicated an absence of correlational reasoning on the part of adult participants (i.e. normal individuals deficient in statistical training do not have cognitive structures functioning on the basic concept of correlation), a lack of relationship between accuracy and event category, and that individuals still develop relational judgments but on the basis of non-statistical information or on an exclusive dependency on the frequency of + + instances. Therefore, the issue is: If people form judgments (which we know they do) without utilizing correlational reasoning or event category as a basis, what basis do they employ? Smedslund, noting the need for further experimentation on certain regularities in variations and over-all tendencies, would reply simply with non-statistical information. From this, we may infer one step further and assume that for highly controversial elements, individuals rely on their attitudinal structures for the formation of judgments.

According to Harding, Proshansky, Kutner, and Chein (1969), prejudice may be viewed as a process wherein which hasty judgments, overgeneralizations, thinking in stereotypes, and refusals to modify a position in the face of

contradictory evidence may occur. As noted by Van Amersfoort (1969), stereotypes appear to be more amenable to assimilation of additional information than prejudices which are liable to revisions only before they are permanently established. Rambo (1969) added that negative-attitude individuals categorize judgments over smaller segments of the continuum, while Serum and Meyers (1970) discovered that highly prejudiced persons assume greater belief dissimilarities between themselves and the attitudinal object than relatively low-prejudiced subjects. Relevant to racial attitudes, Kilty's (1969) data support a conceptualization of attitudes which distinguishes between affect and cognition; while Woodmansee and Cook (1967) disclosed nine major components in attitudinal organization. These were: ease in initiating and developing interracial contacts, the private right of the individual to associate with people of his own choosing, derogatory beliefs, local autonomy in policy-making prerogatives, gradualism in the process of integration, acceptance of the minority member in close personal relationships, integration-segregation policies, acceptance of the minority member in status-superior relationships, Black inferiority, and Black superiority. From these Woodmansee and Cook's research indicated that the maintenance of derogatory beliefs was a relatively successful discriminating dimension between pro-Black and anti-Black organizations. Heinerth (1969) found that

prejudiced subjects unspecifically attribute negative traits to an ethnic group, and several researchers (Renninger & Williams, 1966; Williams & Roberson, 1967; and Williams & Edwards, 1969) have indicated that Caucasian children evaluate the color white positively and the color black negatively. From this, we may conclude that basic to these processes of overgeneralization and stereotyping is the tendency to attribute specific traits to all members of a specific minority group. Since the maintaining of derogatory beliefs can be understood to include the assignment of negative traits, anti-Black prejudice may be viewed as the belief that there is a high correlation between an individual's race and the presence of negative traits. In contrast, since Dienstbier (1970) defined positive Black prejudice as that situation in which a Black individual receives less negative discrimination than a comparable White person, we may infer that an individual who possesses a positive attitude toward a particular group might be expected to believe that membership in this group is highly correlated with possession of positive traits.

As noted above, Smedslund (1963) maintained that the concept of correlation, when drawn from one's own experience, depends on the estimation of frequencies. Specifically in the problem of prejudicial judgments (i.e. the process of stereotyping and overgeneralizing), correlation involves the

categorization of events as conforming or not conforming to the hypothesis of equivalence between trait and race (trait= race) where both are either present or absent. Since relational judgments depend on frequency estimates, it can be inferred that insofar as stereotypes and overgeneralizations characteristic of prejudice are based on implicit correlational beliefs, the ability to correctly estimate relative frequencies of object members and non-members both possessing and not possessing evaluative traits may be classified as a judgmental problem and relevant to the change and development of prejudice. Therefore, considering prejudice as the refusal to modify an opinion in the face of new information (a deviation from the norm of rationality: Lippitt & Radke, 1946; Simpson & Yinger, 1965), the purpose of this project was to analyze the effects of both positive and negative prejudice on the estimation of occurrences of both positive and negative traits within a Black and White population.

Although the effects of attitude on estimation of numbers has been a largely neglected problem, there is considerable empirical evidence suggesting that attitudes do significantly affect perception and recall. Because of this, this project did not deal with either of these areas but instead concentrated on the area of cognition and judgmental processes. However, this previous research is relevant for prediction purposes. Levine, Chein, and Murphy (1942) dis-



covered that subjects tended to produce more food responses and to recognize more food-related words faster when hungry than when satiated. Proshansky and Murphy (1942) found that stimuli recently associated with positive reinforcements became more salient; while Lowenfeld (1961) and others (Rosen, 1954; Dulany, 1957; McNamara, Solley, & Long, 1958; Hochberg & Brooks, 1958) have demonstrated that recognition of stimuli, developed as noxious through electric shock, was impaired. In the area of racial attitudes, Secord, Bevan, and Katz (1956) concluded that highly prejudiced subjects (A) maintained a constant degree of personality stereotyping for a variety of photographs differing in physiognomic Negroidness and (B) tended to exaggerate differences between Blacks and Whites on physical features associated with race. Koslin et al. (1969) indicated that White subjects preferred all-white sketches, and Cagley and Cardozo (1970) showed that highly prejudiced persons display unfavorable reactions to integrated advertising. Wilson (1970) found that prejudiced subjects predicted Blacks' rankings of social-action goals to a lower degree of accuracy (.62) than non-prejudiced Whites (.82), while Coyle and Eisenman (1970) concluded that both White and Black children drew Santa Claus as a Caucasian but that only Black subjects utilized colors associated with race to complete the incidentals in the picture. Katz et al. (1970) demonstrated that younger subjects viewed other race

pairs as being more distinctive and older children as being more similar, with Stern (1969) discovering that attitudes toward Blacks were modified negatively for persons high in hostility when exposed to stimuli depicting aggression by Whites against Blacks. From this experimentation, we may conclude that for at least those situations where accurate perception is not required for immediate action, individuals tend to distort or select their perceptions in a manner congruent with established cognitive structures and in the direction of "seeing what they want to see."

In the area of recall, research has shown that in general people tend to selectively remember ideas and statements which are congruent with existent positions unless motivated to perform otherwise. Feather (1969a, 1969b, 1969c) in his research on consistent and inconsistent attitude structures, Jones and Kohler (1958) and Jones and Aneshansel (1956) on learning contravaluant material have noted that recall is best for both supportive ideas and for easily refutable non-supportive ideas. Lewit and Shanley (1969) indicated that pro-White subjects learned biracial influence structures better than pro-Black persons; and in experimentation varying the pay-off value for recalling the occurrence of the letters of the alphabet, Taub (1965) and Christ (1967) concluded that high-value stimuli were easier to recall than low-value stimuli. However, not all researchers agree with this con-

clusion. Waly and Cook (1966) originally questioned the effect of attitude on memory processes and Greenwald and Sakumura (1967) tested the problem in detail. The results from their three experiments did not substantiate the earlier conclusions. Likewise, Christ and Teichner (1967) failed to replicate the results of the earlier Christ (1967) study.

From this research, one can hypothesize that an individual should be expected to perceive more readily and to remember more positive traits for a positively-valued race with the opposite holding true in the case of a negatively evaluated race. Likewise, employing Secord, Bevan, and Katz's (Tajfel, 1959) research on accentuation, one can further hypothesize that when members of two ethnic groups or races are seen together, judgments of differences between them on positive and negative traits will be distorted and accentuated with the lowly evaluated group perceived as more toward the negative extreme of the continuum and the opposite effect occurring for the group high in evaluation.

Magnitude estimations of percentages (correlation) for elements falling into various trait-race categories depend not only upon accurate perception and memory (when the decision occurs after the principal elements are removed), but demand that the individual proceed one step further and judge how many elements in one category were perceived relative to the number perceived in the other categories.

Considerable evidence has been accumulated demonstrating that number estimations are strongly influenced by two factors: the absolute magnitude of the situation (Erlick, 1964; Miller & Baker, 1968) and by the relative magnitude of the number. With the exception of the research performed by Mann and Taylor (1969), who found that motivation had a significant effect on number estimations for persons standing in long waiting-lines, experimentation on the direction of distortion must be found in the psychophysical literature.

Howel and Funaro (1965), dealing with conditional probability, and Jamison and Kozielicki (1968), analyzing regions of high and low probability-density, discovered a general tendency for individuals to overestimate low values and underestimate high values. Miller and Baker (1968) concluded that subjects usually tend to overestimate the number of small objects and underestimate the number of large objects, while Bevan et al. (1963) found that subjects underestimated the number of beans in a jar regardless of the size of the container (although size had other effects); and Bevan and Turner (1964) demonstrated that a large "figure" frame resulted in overestimations and a small "figure" frame in underestimations with the opposite relationships valid for large and small "ground" frames. Finally, Smedslund (1963) employing meaningful stimuli found no unambiguous relationship between these two tendencies and relative frequency of event

category. Therefore, combining Smedslund's (1963) results with those of Christ and Teichner (1967), we can infer that when the subject's task is to remember or count whether an event occurred or not, the effects of both value and relative magnitude is less (or nonexistent) for meaningful stimuli in contrast with that for non-meaningful stimuli.

In summary, the first three hypotheses tested in this project were:

- A. When employing meaningful stimuli, the effects of the relative magnitude of the figure on number estimations will be minimal.
- B. Although the effects of the true magnitude on relational judgments of positive and negative traits as attributed to members of a biracial population may occur, they will not be of sufficient strength to mask the effects of attitude toward the two races.
- C. Prejudiced subjects will overestimate Black negative traits and White positive traits and will underestimate Black positive traits and White negative traits.

In previous experimentation analyzing the effects of ethnic attitudes on perception and recall, the independent measure has typically been the individual's score on an

instrument measuring prejudice towards the ethnic group of which the subject is not a member. This approach appears valid when the goal of the research is the establishment of differential responses toward members of the other group. However, the aim of this project included an attempt to assess responses to members of the person's own group versus responses to members of the other race. Therefore, the subject's attitude toward his own race as well as his attitude toward the other race had to be computed. In addition, recent research has demonstrated that positive Black prejudice may occur especially when stimulus persons at the positive personality level are compared (Dienstbier, 1970) and for children at least when judging the achievement of ideal standards (Kline, 1970). This evidence seems to indicate that the strong preference for White friends over Black friends among Whites reported in earlier research (Landreth & Johnson, 1953; Stevenson & Stewart, 1958; Morland, 1962; Horowitz, 1936) may be changing and that the assumption that all Whites have a positive attitude toward their own race may be a tenuous assumption. There also seems to be no a priori reason for believing that a person's attitude toward one race is negatively correlated with his attitude toward another race. For these reasons, the independent measure in this study was a relative indicator of racial attitude computed by

subtracting the person's attitude toward Blacks from his attitude toward Whites.

Bock (1960) has indicated that the relationship between analysis of variance and factor analysis is rigorous and formal and not merely an analogous one. This connection, according to the author, becomes apparent when a distinction is made between factor analysis as a "structural" analysis and factor analysis as a form of "discriminal" analysis.

Specifically, his model is applicable to the testing of two dichotomous dimensions. The resultant score for an individual in this situation is equal to:  $x_{ijkt} = \alpha_i + \beta_{ij} + \gamma_{ik} + \delta_{ijk} + \Sigma_{ijkt}$  where  $x_{ijkt}$  is the score of individual "i" on test "jk" on occasion "t",  $\alpha_i$  is a component of scores specific to a particular individual but general for this person to all testing occasions,  $\beta_{ij}$  and  $\gamma_{ik}$  are components of scores specific to the individual and applicable to specific tests B and C respectively,  $\delta_{ijk}$  is an interactional component, and  $\Sigma_{ijkt}$  is a replication error component specific to each participant on each occasion. His model for a design of  $2^2 = 4$  tests from two dichotomies is:

		B	
		1	2
C	1	11	12
	2	21	22

Applying this representation to our particular problem, the

model becomes:

		Traits	
		Positive	Negative
Race	White	11	12
	Black	21	22

The purpose of the structural analysis is to determine whether the obtained sample covariances between the dependent measures are congruent with the model. This covariance matrix for any sample size may be computed from the means of any number of testing replications and is necessary since the four derived component scores from the above model can be visualized as occupying a space with the number of dimensions determined by the rank of the covariance matrix for the original dependent scores. The resultant expected matrix for the population is:

$$\begin{bmatrix} \overline{v} & a & b & \overline{c} \\ a & v & c & b \\ b & c & v & a \\ c & b & a & v \end{bmatrix}$$

where " $v$ " =  $\sigma^2$ , " $a$ " =  $\sigma_{12}$ , " $b$ " =  $\sigma_{13}$ , and " $c$ " =  $\sigma_{14}$ .

According to Bargmann (1957), this matrix form may be classified as the equipredictability pattern since it provides a necessary and sufficient condition for the equality of the multiple correlations between variables. A matrix of this form under pre- and post-multiplication by the



orthogonal matrix P:

$$P = \frac{1}{2} \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & 1 & -1 \\ 1 & -1 & -1 & 1 \end{bmatrix}$$

will reduce to its diagonal form. Note that P gives the four orthogonal contrasts in the 2 X 2 factorial design model.

Bock has shown that if the hypothesis that the off-diagonal elements of the transformed sample matrix are zero in the population is confirmed, then the covariation of any pair of scores can be explained in terms of the shared components associated with ways of classifying the dichotomous dimensions. These components can be labeled and interpreted in terms of contrasts in the factorial design. A statistical test determining whether these off-diagonal elements are actually zero is necessary to judge the correctness of the model. If a likelihood ratio test given by Wilk's Criterion and Bartlett's (1958) approximation for moderate to large samples does not reach statistical significance, we may assume that the model is applicable.

Subsequent to this, the discriminant analysis utilizes the vector representation of test results with the four scores for each individual represented as coordinates of a vector in the appropriate space. This permits an assessment of whether

tests or dichotomous dimensions of known measurement error yield reliable distinctions between individuals; and if so, in how many relevant dimensions. To test these effects, the four scores of  $u_{i1}$ ,  $u_{i2}$ ,  $u_{i3}$ , and  $u_{i4}$  represent the various linear combinations of the parameters of the model. Specifically,  $u_{i1}$  denotes the general ability of individual "i" with respect to these tests,  $u_{i2}$  and  $u_{i3}$  indicate separate abilities in the B and C components of the testing situation. The sign of these measures specify the particular category in which the individual excels. Finally,  $u_{i4}$  estimates any specific interaction effects with a positive value indicating that these effects are causing scores in the first category of B to differ more than those in the second and vice versa for C.

Applying this information to our project, the first variable,  $u_{i1}$  (labeled: "accuracy indicator"), simply indicates whether one group of individuals made more estimation errors than another and if so in what direction. This factor was calculated by:  $\underline{c}$  (White Positive estimate error + White Negative estimate error) +  $\underline{c}$  (Black Positive estimate error + Black Negative estimate error). The second contrast ( $u_{i2}$ ), labeled absolute-White bias, reveals whether there was an overestimation tendency of the absolute number of Whites or Blacks in the population and was determined by the combination of:  $\underline{c}$  (White Positive estimate error + White Negative estimate error) -  $\underline{c}$  (Black Positive estimate error + Black Negative estimate error).

tive estimate error). The final two contrast variables ( $u_{i3}$  and  $u_{i4}$ ) indicate whether trait was a significant discriminating dimension or whether a combination of race and trait is often utilized by prejudiced, nonprejudiced, or both types of individuals for discrimination purposes. The  $u_{i3}$  and  $u_{i4}$  variables are referred to in the following discussion as positive-trait bias and pro-White bias and were computed according to the linear combination of:  $\underline{c}$  (White Positive estimate error + Black Positive estimate error) -  $\underline{c}$  (White Negative estimate error + Black Negative estimate error) and by:  $\underline{c}$  (White Positive estimate error + Black Negative estimate error) -  $\underline{c}$  (White Negative estimate error + Black Positive estimate error) respectively. Since "c" may be a constant weight if the obtained covariance matrix closely approximates the equipredictability covariance pattern (otherwise, factor weightings will be incorporated), the contrast variables may be represented as:

#### D I M E N S I O N S

Contrast Variables	<u>White</u>		<u>Black</u>	
	<u>Positive</u>	<u>Negative</u>	<u>Positive</u>	<u>Negative</u>
	11	12	21	22
$u_{i1}$	+ .5	+ .5	+ .5	+ .5
$u_{i2}$	+ .5	+ .5	- .5	- .5
$u_{i3}$	+ .5	- .5	+ .5	- .5
$u_{i4}$	+ .5	- .5	- .5	+ .5

Therefore, in summary, another purpose of this project was to determine the specific biases relevant to the construction of judgments in a biracial social situation. Bock's model served as a simulation model of an individual involved in these circumstances with the application of his hypothetical design to our particular problem involving positive and negative traits and Black and White people.

In conclusion, this project tested these four hypotheses:

- A. When employing meaningful stimuli, the effects of the absolute and relative magnitude of the figure on number estimations will be minimal.
- B. Although the effects of the true magnitude on relational judgments of positive and negative traits as attributed to members of a biracial population may occur, they will not be of sufficient strength to mask the effects of attitudes toward the two races.
- C. Prejudiced subjects will overestimate Black negative traits and White positive traits and will underestimate Black positive traits and White negative traits.
- D. Bock's model will be applicable for the determination of judgmental tendencies with the third and fourth contrast variables testing hypothesis C with the prediction that there

should be a positive relationship between level of attitude and magnitude of estimation errors for pro-White bias and a negative relationship between attitude level and magnitude of estimation errors for positive-trait bias. The second contrast variable will test hypotheses A and B with the prediction that attitude will be more relevant than magnitude on determination of estimations and that this relationship will be positive.

## Method

Subjects. The subjects were 162 white male Navy servicemen from the Electronic Technician School at Great Lakes Naval Training Center located in Great Lakes, Illinois. All participants were between the ages of eighteen and twenty-four, possessed some college experience but no formal academic degrees, and ranked in the top two percent of all Navy personnel on intellectual capabilities. After determination of the individual's level of prejudice through Osgood's Semantic Differential, three groups of 54 subjects each were randomly composed with each participant being randomly assigned to one of the experimental conditions. The attitude scale was administered by regular Navy instructors in one session to eliminate possible testing bias. The experimenter, introduced simply as a psychologist from Loyola University analyzing inductive reasoning processes, administered the experimental task approximately seven weeks after the initial contact with the subjects. All persons were run individually and were instructed that the two testing sessions were unrelated.

### Session One: Administration of Attitude Scale

Each subject was required to rate a number of American ethnic groups under the pretense that it was a suicide prediction test employing the standard format of the semantic differential and the following instructions:

In order to get some idea of your impressions about the person (group) whose behavior you have just predicted, the page following each prediction will contain a series of descriptive scales. Please rate the person (group) on the basis of your first impression about that individual (group).

Here is how to use the scales: Place an "X" in the appropriate space on each of the seven-point scales. For example if you feel that the person is VERY GOOD you might place your "X"

bad \_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_: X good  
neutral

If you feel that the person is VERY BAD you might place your "X"

bad X:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_:\_\_\_\_ good  
neutral

Or you might feel that the person should be somewhere in between in which case you should mark your "X" in one of the middle spaces.

IMPORTANT: (1) Place your check-marks in the spaces, not on the boundaries:

THIS		NOT THIS
		X
<u>X</u> :____:____:____:____:____:____		

- (2) Be sure you check every scale for every concept. Do not omit any. Guess if necessary in order to complete all the scales.
- (3) Never put more than one check-mark on a single scale.

Sometimes you may feel as though you have seen the same person (group) before on the test. This will not be the case, so please do not look back and forth through the pages. Do not try to remember how you checked similar persons before in the test. Make each judgment separate and independent. Work fairly quickly. Do not worry or puzzle over individual scales. Since first impressions vary from rater to rater, there are no right or wrong answers. It is your first impression, the immediate "feelings" about the person (group), we want. On the other hand, please do not be careless as we want your "true impressions."

Among the groups rated were the Black American and White American with each being rated on twenty-four seven-step bipolar adjective scales. (See Table 1)



Table 1  
The Twenty-Four Bipolar Adjective Scales and the Ten Ethnic  
Groups Employed in the Semantic Differential

Ethnic Groups	Bipolar Adjectives	
Chinese American Black American White American Negro American Mexican American American Indian Caucasian American Jewish American Irish American Polish American	Emotional-Rational Reputable-Disreputable Submissive-Dominant Pleasant-Unpleasant Friendly-Unfriendly Fair-Unfair Dishonest-Honest Powerful-Powerless Clean-Dirty Lazy-Hardworking Grateful-Ungrateful Good-Bad	Poor-Rich Belligerent-Peaceful Disagreeable-Agreeable Worthless-Valuable Violent-Nonviolent Altruism-Egotistic Static-Dynamic Sexy-Unsexy Moral-Immoral Naive-Shrewd Guilty-Innocent Energetic-Unenergetic

The attitude index was based on the individual's responses to the five scales of: good-bad, valuable-worthless, fair-unfair, pleasant-unpleasant, and clean-dirty. These five scales have been shown by Osgood, Suci, and Tannenbaum (1957) to be high on the evaluative dimension and to correlate highly with Thurstone's measure of anti-Black prejudice. The order of the group concepts were random for all subjects with half of the subjects rating the Black American first and half rating the White American first. The order of the bipolar adjective scales was randomly determined for the first group concept, the second group concept, and all filler items, but all orders were constant across subjects.

Responses on each scale were scored from one to seven in the direction of positive evaluation. Since the purpose of the project was to determine the affect of general attitudinal structures upon judgments, responses to the five scales mentioned previously were summed to give a range of possible scores from 5 to 35. This yielded a measure of over-all liking for Whites and for Blacks. Then in order to obtain a measure of preference for one race relative to the other, the Black American score was subtracted from the White American score giving a range of possible scores from -35 to +35. This meant that preference for Blacks was represented by a negative score, for Whites by a positive score, and a score of zero indicated no predominant preference for either

group. For this study, a negative score was assigned to the low prejudice group, a score between one and six to the middle group, and any subject with an attitude index larger than seven to the high prejudice group.

## Session Two: Administration of Experimental Task

Overview. There were nine experimental conditions: three content areas each with three levels of "objective reality." Each content condition consisted of two bipolar traits: one positive and one negative. These trait areas were labeled as clean-dirty, lazy-hardworking, and violent-nonviolent. The three different levels of "reality" presented these traits as being associated with Black people or White people according to various percentage distributions. Specifically, in Condition A, the positive traits and the negative traits were attributed to both White people and Black people 25% of the time. In Condition B, the positive traits were ascribed to White people 35% of the time and to Black people on only 15% of the stimuli. In contrast, the negative traits were assigned to White people 15% and to Black people 35% of the time. Condition C was the exact opposite of Condition B with all conditions containing a total of 40 stimuli.

(See Table 2 for details)

Stimulus Materials. For all experimental conditions, the stimuli were stylized paintings presented to the subject by an opaque projector. Each picture depicted a scene from one of the six content areas: clean, dirty, lazy, hardworking, violent, nonviolent. For all stimuli, the individual in the scenes occupied a central position and all scenes were

Table 2

The Absolute Number of Stimuli Depicting a Relationship  
Between Race and Trait for Each of the Three  
Levels of "Objective Reality" for  
All Content Conditions

Race	<u>Condition A</u>		<u>Condition B</u>		<u>Condition C</u>	
	Traits		Traits		Traits	
	Positive	Negative	Positive	Negative	Positive	Negative
White	10	10	14	6	6	14
Black	10	10	6	14	14	6

designed to be as realistic as possible. Extraneous features (color of clothes, age of the model, and background objects) remained constant for all conditions. The only variables changing were the sex of the person and the color of the individual's skin. Pictures within each condition were randomly presented to the participants.

In the clean-dirty content condition, the scene depicted an individual (clothed either in a short-sleeved shirt and blue trousers or in a plain house-dress) standing near a stove cooking breakfast. The kitchen was modern and representative of a "typical" middle-class home. For the dirty condition the scene was messy, dirty, and totally unkept. In contrast, the "clean" kitchen was neat, orderly, and spotless.

For the lazy-hardworking condition, the stimuli represented a typical office containing desks, file cabinets, and other objects found in this type of setting. To depict laziness, the individual (clothed in a janitor's uniform) was seated in the office chair, feet comfortably placed on the desk, and eyes shut. The cleaning broom was leaning against the desk with papers all over the floor and the desk and basket cluttered with wastepaper. In the hardworking stimuli, the person was busy sweeping the floor with the desk neat and orderly and the wastebasket emptied.

The violent paintings displayed an individual as holding an incendiary device and preparing to throw it through a

store-front window which was currently burning. (An example of all three scenes may be found in Appendix A). In the non-violent stimuli, the individual (clad in blue trousers and sweat shirt) was standing in front of the store proceeding about his/her daily business. All pictures were previously tested in a pilot study to insure that each scene depicted the correct content area.

Procedure and Instructions. Each subject upon entering the experimental room was seated at a large table in front of an overhead screen. The experimenter introduced himself and attempted to establish some rapport with the individual. The subject's first task was to read quietly the following general instructions:

Most people can work a percentage problem on paper or figure out simple relationships without any difficulty. But in daily life the impression a person has of a particular group usually determines his estimation of the percentage of people in that group having a particular trait. This is a test to see how well people are able to form relationships; or in other words, to see how well people estimate percentages on the basis of first impressions. How well you do has nothing to do with your intelligence or

mathematical ability. Since most recent researchers on this topic consider race differences and similarities as an adequate method of testing relationships, the problems in this study have been drawn from this area.

Upon completion of this material, the subject received instructions specific to the particular condition that he was assigned to. Each subject was requested to read these directions while the experimenter delivered them verbally. (These instructions can be found in Appendices B, C, and D). The experimenter then informed the participant that the purpose of the research was to measure how people make first impressions and to analyze how people are able to utilize this information in forming relationships. He also commented on the importance of first impressions in everyday life and emphasized the quickness of most first impression formations and requested that the subject not memorize or count the stimuli. The student was then shown the four pictures which constituted the experimental task along with their respective labels. After all questions were answered, the experiment began.

All stimuli were flashed on the screen at the rate of one every three seconds. The order of the drawings was random and the order of problems for each subject was random. To insure that everyone understood the instructions and to eliminate any possible biasing, the first problem was always from



Condition A. In order for the Bock model to be applicable to the data, all subjects participated in three replications of the problem. Two other filler items were also included to eliminate subject expectancy and to portray as realistic a situation as possible. The six possible random orders for these six presentations are shown in Table 3.

Table 3

The Six Random Orders for the Presentation of Three Real Problems  
(Replication 1, 2, 3) and Three Filler Items

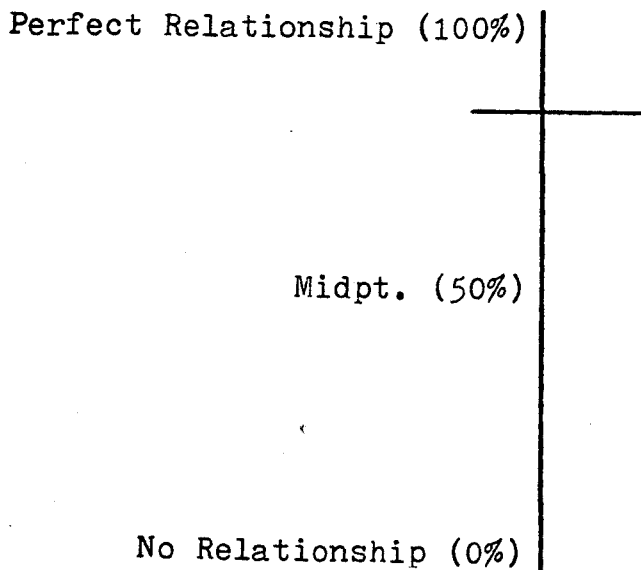
Random 1 Order	<u>Problems</u>					
	2	3	4	5	6	
1	Filler	Replication 1	Filler	Replication 2	Filler	Replication 3
2	Filler	Filler	Replication 1	Replication 2	Replication 3	Filler
3	Filler	Filler	Filler	Replication 1	Replication 2	Replication 3
4	Filler	Replication 1	Replication 2	Filler	Replication 3	Filler
5	Filler	Replication 1	Filler	Filler	Replication 2	Replication 3
6	Filler	Filler	Replication 1	Replication 2	Filler	Replication 3

After each problem, the experimenter requested that the subject answer four questions. In each case, the individual was to estimate the degree to which Blacks and Whites were exhibiting both positive and negative traits. These four estimates were acquired by asking the subject "What is the degree of the relationship between being White (Black) and the positive (negative) trait" in the set of stimuli just viewed. The subject responded in a manner prescribed by the instructions:

Based on the set of stimuli which you have just seen, several questions will be asked. Please answer all of the questions on the basis of your first impression. Do not spend a lot of time thinking about any one question or worrying about your response; just put down your first impression.

For each question, you will be asked to indicate the degree of relationship between two objects, concepts, or facts. Please indicate what you think the degree is by placing a hash-mark on the rating line. This rating line proceeds from a "perfect relationship" meaning that the two items are perfectly related or that the two concepts were related 100% of the time in the stimuli just viewed;

to the "midpoint" which indicates that the two items are related but not perfectly or more specifically that the two concepts were related in 50% of the stimuli just shown; to "no relationship" which means that the two items are not related at all or that the two concepts were not paired at all in the set of pictures just viewed. An illustration might demonstrate the point. Assume that the question is "What is the relationship between redness and ripened tomato?" You may realize that most ripened tomatoes are red but not all. Therefore the relationship is a high one but not a perfect one. On the scale, this would be shown as:



All questions will be asked in this manner; and in all instances, please reply by placing a hash-mark on the line.

NOTE: (A) Please answer all questions.

(B) Please use a horizontal hash-mark as in the example above in order that your answer will be clear.

(C) Answer all questions quickly but please do not be careless.

If you have any questions about the scale or the procedure, please feel free to ask the experimenter now before we proceed with the experiment. If you understand the scale and have no questions, please turn the page and begin answering the questions.

For all problems, the four specific questions were:

(A) White Positive:

What is the degree of the relationship between being White and being clean/hardworking/nonviolent?

Perfect Relationship (100%)

Midpt. (50%)

No Relationship (0%)

(B) White Negative:

What is the degree of the relationship  
between being White and being dirty/  
lazy/violent?

Perfect Relationship (100%)

Midpt. (50%)

No Relationship (0%)

(C) Black Positive:

What is the degree of the relationship  
between being Black and being clean/  
hardworking/nonviolent?

Perfect Relationship (100%)

Midpt. (50%)

No Relationship (0%)

(D) Black Negative:

What is the degree of the relationship

between being Black and being dirty/  
lazy/violent?

Perfect Relationship (100%)

Midpt. (50%)

No Relationship (0%)

Each measurement was requested in a different random order for each problem and for each condition but were identical for all subjects in that condition. All scales were presented as proceeding both directions (i.e. from perfect to none and from none to perfect) to control for response bias.

Upon completion of this task, the subject was shown another set of stimuli preceded by a brief set of instructions (See Appendices B, C, and D). This procedure was continued until all six problems were completed. Each subject was assigned to only one experimental condition with each person being debriefed as much as possible after the study. In addition, all subjects were asked to complete a biography page, not to discuss the project with anyone, and thanked for their cooperation.

## Results

The raw data for this study were the four estimates acquired from each subject by asking him to estimate the degree to which Blacks and Whites were exhibiting both positive and negative traits in a set of stimuli previously viewed. The subject responded by placing a hash-mark on a rating line which proceeded from 0% to 100%. The precise numerical index of this mark was subsequently determined by comparing the placement of the subject's response to a standard rating line which had been graded to the nearest tenth of a percent. This comparison technique was utilized for all four estimates on all three replications, thus yielding twelve scores for each individual; three numerical indices for White positive, three for White negative, three for Black positive, three for Black negative. The three estimates for each response category were then averaged to obtain a mean estimation score for each participant.

In order to standardize these scores across the three conditions of "objective reality," each having different frequency distributions, estimate error scores were computed by subtracting the "true" percentage from the mean estimated percentage for each of the four percentage estimations. A positive error score signified a percentage overestimation and a negative error score indicated a percentage underestimation. These transformed error scores were then utilized as



the dependent scores for all further analyses.

The four estimate-error variables of White positive, White negative, Black positive, and Black negative can be viewed as occupying a space with the number of dimensions determined by the rank of the covariance matrix for the original estimate errors. The initial set of observations can be completely represented by a set of component scores which are uncorrelated and uniquely defined. This latter property is due to the fact that a principal component analysis yields a first component of maximum variance, a second with the next largest variance, but orthogonal to the first, etc. From another point of view, the first component reflects the over- and underestimation tendencies which account for the largest amount of variance. Consequently, the first analysis performed was to determine the applicability of Bock's model to the collected data. Specifically, this involved separate structural analyses for each of the three levels of "objective reality" to clarify whether the model was relevant for only one condition or all three. For all three conditions, this involved calculating the covariance and the correlation matrix for the sample data, transforming these matrices by pre- and post-multiplication by  $P$  and performing the final test of association. Transformation by the orthogonal matrix " $P$ " will reduce an equipredictability-patterned matrix to its diagonal form. As a result, " $P$ " gives

the four orthogonal contrasts in the 2 X 2 factorial experimental design. The test of association is necessary to determine whether the hypothesis that the off-diagonal elements of the transformed sample matrix are zero in the population is confirmed. If this test does not reach significance, then the covariation of any pair of scores can be explained in terms of the common components associated with ways of classifying the tests. These components can be labeled and interpreted in terms of the contrasts in the factorial design. The analyses and results for each of the three experimental levels are presented separately.

#### Condition A

Table 4 presents the covariance and correlation matrices for the original mean estimation scores in Condition A. The results indicate that there was a negative relationship between White positive and White negative, Black positive and White positive, Black negative and White negative, and Black negative and Black positive. The largest positive covariation was between Black negative and White positive with a comparable relationship between elements Black positive and White negative. From the correlation matrix, the figures indicate that the largest negative relationship was between factors White negative and White positive with a value of  $-.82$  and that the smallest negative value was between factors Black positive and White positive with a correlation of

-.67. The value for the two positive relationships where .64 (Black positive - White negative) and .76 (Black negative - White positive).

The matrices in Table 5 demonstrate that the four variance values were 36.71, 41.92, 53.04, and 485.29 for the four factors. From the correlation matrix, we can observe that most of the coefficients are small (-.06, -.03, -.02) with the largest values being -.32 and -.27. In order for Bock's model to be applicable, the off-diagonal elements of the transformed sample matrix must be zero in the population. To determine this statistically, a likelihood ratio test given by Wilk's Criterion must be applied to the matrix. In this instance, the value of  $\chi^2$  was 8.64 which is significant only at the .15 level; and therefore, the criterion of the structural test did not reach significance and the assumption that the composition of the scores specified by the model is correct is accepted. Basically, this means that the discriminial analysis may proceed.

Table 4  
The Covariance and Correlation Matrices for the  
Original Mean Scores from Condition A

	<u>Covariance Matrix</u>				<u>Correlation Matrix</u>			
	<u>Factors</u>				<u>Factors</u>			
	White Positive	White Negative	Black Positive	Black Negative	White Positive	White Negative	Black Positive	Black Negative
White Positive	137.31				1.00			
White Negative	-119.98	156.27			-.82	1.00		
Black Positive	-103.53	104.68	173.78		-.67	.64	1.00	
Black Negative	108.83	-115.20	-109.87	149.60	.76	-.75	-.68	1.00

Table 5  
The Transformed Covariance and Correlation  
Matrix for Condition A

<u>Covariance Matrix</u>					<u>Correlation Matrix</u>				
<u>Contrast Variables</u>					<u>Contrast Variables</u>				
1	2	3	4		1	2	3	4	
1	36.71				1	1.00			
2	-12.50	41.92			2	-.32	1.00		
3	7.14	-12.86	53.04		3	.16	-.27	1.00	
4	-8.71	-4.52	-2.40	485.29	4	-.06	-.03	-.02	1.00

Condition B

The covariance and correlation matrices for the original mean estimation scores from Condition B are presented in Table 6. The data signify that negative relationships exist between factors White negative and White positive, Black positive and White positive, Black negative and White negative, and Black negative and Black positive; with positive covariance between Black positive and White negative and Black negative and White positive. The degrees of correlation ranged from  $-.75$  for Black positive and Black negative to  $.28$  for factors White negative and Black positive. Most of the remaining coefficients were in the range  $.33$  to  $.43$ .

Table 7 contains the transformed matrices for Condition B. The results indicate that the variance for contrast variable 1 was 47.03; for contrast variable 2, 51.89; for contrast variable 3, 155.61; and finally for contrast variable 4, 383.54. Once again, the correlation matrix demonstrates that the off-diagonal elements are near zero. The only exceptions are  $r_{42} = .25$  and  $r_{43} = -.24$ . Statistically determining whether these elements differ significantly from zero, the value of the likelihood ratio test was only 7.37 which has no statistical significance. This means that Bock's model for combination of scores is acceptable and that the discriminant analysis should be performed.

Table 6  
The Covariance and Correlation Matrices for the  
Original Mean Scores from Condition B

	<u>Covariance Matrix</u>				<u>Correlation Matrix</u>			
	<u>Factors</u>				<u>Factors</u>			
	White Positive	White Negative	Black Positive	Black Negative	White Positive	White Negative	Black Positive	Black Negative
White Positive	159.99				1.00			
White Negative	-79.59	102.15			-.62	1.00		
Black Positive	-71.75	39.94	203.03		-.40	.28	1.00	
Black Negative	71.60	-44.65	-140.52	172.91	.43	-.34	-.75	1.00

Table 7  
The Transformed Covariance and Correlation  
Matrix for Condition B

<u>Covariance Matrix</u>					<u>Correlation Matrix</u>				
<u>Contrast Variables</u>					<u>Contrast Variables</u>				
1	2	3	4		1	2	3	4	
1	47.03				1	1.00			
2	2.01	51.89			2	.04	1.00		
3	8.44	-8.90	155.61		3	.10	-.10	1.00	
4	22.76	35.54	-58.92	383.54	4	.17	.25	-.24	1.00



Condition C

The covariance matrix and the correlation matrix for the original mean estimation scores in Condition C are presented in Table 8. The results indicate a negative relationship between White negative and White positive, Black positive and White positive, Black negative and White negative, and Black negative and Black positive. The correlation coefficients indicate that the strengths of these relationships were  $-.53$ ,  $-.45$ ,  $-.44$ , and  $-.71$ . The two positive values were only  $.45$  (factor White negative - Black positive) and  $.38$  (factor Black negative - White positive).

The transformed matrices are located in Table 9. The variances for the four variables were 63.29, 77.72, 136.89, and 447.44 respectively. From the correlation matrix, it becomes apparent that again most of the values are near zero. The highest figures are  $.25$  and  $.20$  with the remainder ranging between  $.19$  and  $-.03$ . Performing the likelihood ratio test, the  $\chi^2$  value was 7.21 which is barely significant at the  $.30$  level. Therefore, the criterion of the structural test did not reach significance and Bock's model was determined applicable to the data from Condition C, thus permitting the completion of the discriminial analysis.

Table 8  
The Covariance and Correlation Matrices for the  
Original Mean Scores from Condition C

	<u>Covariance Matrix</u>				<u>Correlation Matrix</u>			
	<u>Factors</u>				<u>Factors</u>			
	White Positive	White Negative	Black Positive	Black Negative	White Positive	White Negative	Black Positive	Black Negative
White Positive	211.59				1.00			
White Negative	-93.77	145.62			-.53	1.00		
Black Positive	-96.24	80.22	216.09		-.45	.45	1.00	
Black Negative	67.84	-66.25	-127.90	152.05	.38	-.44	-.71	1.00

Table 9  
The Transformed Covariance and Correlation  
Matrix for Condition C

<u>Covariance Matrix</u>					<u>Correlation Matrix</u>				
<u>Contrast Variables</u>					<u>Contrast Variables</u>				
1	2	3	4		1	2	3	4	
1	63.29				1	1.00			
2	14.33	77.72			2	.20	1.00		
3	17.51	6.67	136.89		3	.19	.06	1.00	
4	-5.71	47.50	-19.80	447.44	4	-.03	.25	-.08	1.00

### Discriminal Analysis

Due to the close approximation of the obtained covariance matrices to the equipredictability covariance pattern, contrast scores were computed using weights of .5. The four contrast scores were computed for each level of "objective reality" corresponding to the vectors  $p_1$ ,  $p_2$ ,  $p_3$ , and  $p_4$  of  $P$ . These four variables were labeled accuracy indicator, absolute-White bias, positive-trait bias, and pro-White bias, respectively. Since Bock's model was applicable to all three experimental levels, the discriminial analyses were performed. Table 10 presents the special values employed for the F-ratios and other special statistics necessary for the discriminial analysis.

Table 10

Values for the F-Ratios and Other Statistics  
Performed in the Discriminal Analysis

Statistical Effects	<u>Variables</u>			
	A	B	C	D
F-Ratios	$\frac{v_a}{v_b+v_c-v_d}$	$\frac{v_b}{v_d}$	$\frac{v_c}{v_d}$	$\frac{v_d}{v_e^*}$
Degrees of Freedom ( $n_1$ )	$N - 1$	$N - 1$	$N - 1$	$N - 1$
Degrees of Freedom ( $n_2$ )	$\frac{(v_b+v_c-v_d)^2}{(v_b^2+v_c^2+v_d^2)/N-1}$	$N - 1$	$N - 1$	$N - 1$
Variance Components	$\sigma_a^2 = \frac{v_a - v_b - v_c + v_d}{4}$	$\sigma_b^2 = \frac{v_b - v_d}{2}$	$\sigma_c^2 = \frac{v_c - v_d}{2}$	$\sigma_d^2 = v_d - v_e$
Intraclass Correlations	$\frac{a^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2 + \sigma_d^2 + \sigma_e^2 / r}$	$\frac{b^2}{\sigma_b^2 + \sigma_d^2 + \sigma_e^2 / r}$	$\frac{c^2}{\sigma_c^2 + \sigma_d^2 + \sigma_e^2 / r}$	$\frac{d^2}{\sigma_d^2 + \sigma_e^2 / r}$
Least Significant	$t.05 \sqrt{v_b+v_c-v_d}$	$t.05 \sqrt{v_d}$	$t.05 \sqrt{v_d}$	$t.05 \sqrt{v_e}$

$$*v_e = \Sigma(\Sigma x_{ijkt}^2 - rx_{ijk}^2)$$

The results contained in Tables 11, 12, and 13 demonstrate that the analysis for each condition yielded the same conclusion. In the first case, the pro-White bias contrast variable yielded significant results while the other three variables had no effect at all. The variance component for the last factor was 378.19 and the intraclass correlation was equal to .81. For Condition B, the same general results were disclosed with the intraclass correlation equal to .78 and the least significant difference at 34.77. For the last condition, the pro-White bias was a significant contrast variable with the intraclass correlation at .80. All other analyses were not significant, indicating that only the fourth variable explained the particular response sequence utilized by the subjects in all three conditions. Specifically, this means that most subjects tended to overestimate White positive and Black negative and underestimated White negative and Black positive. Since all four of the contrast scores thus derived can be regarded as statistically independent of each other, a separate analysis of variance for three factors (collapsing over sex of the stimulus figure which was not significant in any of the analyses) was carried out for each variable.

Table 11  
Results of the Discriminal Analysis  
for Condition A

<u>Analysis of Variance</u>						
Effect	df	Mean Squares	F	Variance Components	Intraclass Correlations	Least Significant Differences
Accuracy Indicator	53	36.71	.09	—	—	—
Absolute- White Bias	53	41.92	.08	—	—	—
Positive- Trait Bias	53	53.04	.11	—	—	—
Pro-White Bias	53	485.29	45.31*	378.19	.81	20.28

\*p < .001

Table 12  
Results of the Discriminal Analysis  
for Condition B

<u>Analysis of Variance</u>				Variance Components	Intraclass Correlations	Least Significant Differences
Effect	df	Mean Squares	F			
Accuracy Indicator	53	47.03	.27	—	—	—
Absolute- White Bias	53	51.89	.14	—	—	—
Positive- Trait Bias	53	155.61	.41	—	—	—
Pro-White Bias	53	383.54	21.62*	206.13	.78	34.77

\*p < .001



Table 13  
Results of the Discriminal Analysis  
for Condition C

<u>Analysis of Variance</u>						
Effect	df	Mean Squares	F	Variance Components	Intraclass Correlations	Least Significant Differences
Accuracy Indicator	53	63.29	.27	—	—	—
Absolute- White Bias	53	77.72	.17	—	—	—
Positive- Trait Bias	53	136.89	.31	—	—	—
Pro-White Bias	53	447.44	24.77*	429.38	.80	35.40

\* $p < .001$

### Analysis of Variance for the Accuracy Indicator

Table 14 presents the mean scores for the first contrast variable, accuracy indicator, in relation to relative attitudes toward Blacks and Whites. As noted above, each score was computed according to the linear combination of .5 (White positive estimate error + White negative estimate error) + .5 (Black positive estimate error + Black negative estimate error). A score above fifty represents a general tendency on the part of subjects to overestimate scores and a score below fifty reflects a tendency for subjects to underestimate the various percentage estimations. From the results, it is apparent that for all three conditions, most subjects overestimated the "true" percentages. As a whole, this trend was most pronounced in Condition B (over-all mean of 52.87) with Conditions A and C yielding almost identical means (51.94 and 51.99). Within Condition A, there is the highest and lowest mean estimation score: the lowest appearing with the lazy-hardworking group (50.48) and the highest occurring with the violent-nonviolent condition (53.84).

Table 15 summarizes the analysis of variance for the data on the first contrast variable. There were no main effects, nor any interaction effects indicating that all groups were comparable in their ability to formulate the required estimations. These non-significant results are to be expected and necessary to adequately test the various group

effects on the other contrast variables.

Table 14

Mean Score for Each Level of Objective Reality on Each Trait  
 Content for the Accuracy Indicator, Absolute-White  
 Bias, and Positive-Trait Bias

<u>Level of Reality</u>	<u>Trait Content</u>	<u>Accuracy Indicator</u>	<u>Absolute- White Bias</u>	<u>Positive- Trait Bias</u>
Condition A	Clean-Dirty	51.67	0.08	2.94
	Lazy-Hardworking	50.48	-0.26	-1.80
	Violent-Nonviolent	53.84	-2.15	1.43
Condition B	Clean-Dirty	51.19	-2.06	3.84
	Lazy-Hardworking	53.63	-0.81	3.61
	Violent-Nonviolent	53.79	-1.16	1.62
Condition C	Clean-Dirty	52.29	-0.34	1.05
	Lazy-Hardworking	52.05	-3.08	-0.27
	Violent-Nonviolent	51.48	2.31	1.83

Table 15  
Analysis of Variance for the Accuracy Indicator

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Attitude (A)	2	164.82	82.41	1.58
Trait Content (C)	2	29.58	14.79	< 1
Objective Reality (O)	2	50.73	25.36	< 1
A X C	4	145.28	36.32	< 1
A X O	4	37.29	9.32	< 1
C X O	4	136.49	34.12	< 1
A X C X O	8	253.52	31.69	< 1
Error	135	7025.46	52.04	
Total	161	7843.18		

### Analysis of Variance for Absolute-White Bias

Mean scores for absolute-White bias are presented in Table 14. Since scores were computed according to the formula: absolute-White bias = .5 (White positive estimate error + White negative estimate error) - .5 (Black positive estimate error + Black negative estimate error), a positive score indicates an overestimation of the number of Whites in the population and a negative score indicates an overestimation of the number of Blacks. The results demonstrate that in most groups, subjects tended to overestimate the number of Blacks with the largest figure occurring in the lazy-hardworking group in Condition C (-3.08). The only overestimations of Whites occurred in the clean-dirty condition (.08) and the violent-nonviolent condition of level C (2.31).

The results of the analysis of variance for this contrast variable are presented in Table 16. The analysis indicates that there were no main effects nor any interaction effects. This means that subjects rated high on group preference did not see more Whites than those rated low on group preference and that this trend held for all three trait-content conditions and all levels of "objective reality."

Table 16

## Analysis of Variance for Absolute-White Bias

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Attitude (A)	2	15.11	7.55	< 1
Trait Content (C)	2	25.84	12.92	< 1
Objective Reality (O)	2	30.01	15.00	< 1
A X C	4	408.76	102.19	1.86
A X O	4	457.21	114.30	2.08
C X O	4	298.99	74.75	1.36
A X C X O	8	472.08	59.01	1.07
Error	135	7413.10	54.91	
Total	161	9121.11		

Analysis of Variance for Positive-Trait Bias

Table 14 presents the mean scores for the positive-trait bias in relation to relative attitudes toward Blacks and Whites. Scores, as noted above, were calculated according to the linear combination:  $\text{positive-trait bias} = .5 (\text{White positive estimate error} + \text{Black positive estimate error}) - .5 (\text{White negative estimate error} + \text{Black negative estimate error})$ . Thus a positive score reflects an overestimation of persons with positive traits regardless of race and a negative score indicates an overestimation of persons with negative traits. The results show that only two conditions (lazy-hardworking of A (-1.80) and lazy-hardworking of C (-0.27)) yielded an overestimation of negative traits. The clean-dirty condition of level B yielded the greatest amount of positive-trait overestimation (3.84) and the clean-dirty condition of level C resulted in the smallest amount with a mean of 1.05.

Table 17 contains the analysis of variance for positive-trait bias. The results reflect that there were no main effects nor any interaction effects. This indicates that subjects do not have the tendency to over-assign either positive or negative traits to individuals. This result was not only applicable to the three levels of attitude but also to all trait conditions and to all levels of "objective reality."



Table 17

## Analysis of Variance for Positive-Trait Bias

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Attitude (A)	2	38.00	19.00	< 1
Trait Content (C)	2	167.93	83.97	< 1
Objective Reality (O)	2	119.26	59.63	< 1
A X C	4	529.45	132.36	1.06
A X O	4	181.40	45.35	< 1
C X O	4	186.41	46.60	< 1
A X C X O	8	280.21	35.03	< 1
Error	135	16930.14	125.41	
Total	161	18432.81		

### Analysis of Variance for Pro-White Bias

Each score for this contrast variable was computed according to the formula:  $\text{pro-White bias} = .5 (\text{White positive estimate error} + \text{Black negative estimate error}) - .5 (\text{White negative estimate error} + \text{Black positive estimate error})$ . Therefore, a positive score reflects an overestimation of positive-trait Whites and negative-trait Blacks taken as a group and an underestimation of negative-trait Whites and positive-trait Blacks taken as a group. This analysis serves as a test of the main prediction that subjects with a pro-White attitude would be biased in favor of Whites whereas subjects with a pro-Black attitude would be biased in favor of Blacks. The results of the analysis of variance for this contrast variable are presented in Table 18.

Main effects for attitude and "objective reality" were significant at the .001 level. Scheffe's method for multiple comparisons was employed to test differences between specific means. The results indicate that the high-attitude group (15.27) differed significantly from the middle-attitude group (-1.62) which in turn differed significantly at the .05 level from the low-attitude group (-15.92). For the three conditions of "objective reality," the mean for the racial equality condition (-0.57) was significantly different from the mean for the White superior condition (-14.19) which also differed significantly from the Black superior condition (12.49).

Table 18 demonstrates that there was a significant interaction between attitude and "objective reality." The individual cell means are contained in Table 19. Comparisons demonstrated that the high-attitude - Condition C group and the high-attitude - Condition A group differed significantly from all other groups. The middle-attitude - Condition C group, the low-attitude - Condition C group, and the middle-attitude - Condition A group did not differ from each other, but each differed significantly from both the low-attitude - Condition A group and the low-attitude - Condition B group which were statistically comparable. Finally, the middle-attitude - Condition B group was similar to the high-attitude - Condition B group but both differed significantly from the low-attitude - Condition B group. These comparisons indicate that the general trend for the individual means was to proceed from high positive for the high-attitude group to highly negative for the low-attitude group and from negative for Condition B to nearly zero for A to positive for Condition C but that the interaction was complex and could not be explained on the basis of only one or two groups.

The material in Table 20 specifies the amount of overestimation or underestimation by all subjects in one condition for the four estimates of White positive, White negative, Black positive, and Black negative. A positive number signifies overestimation and a negative number means underesti-

mation. In general, the subjects were quite accurate with the smallest amount of overestimating occurring on the White positive estimate in the clean-dirty - level A condition (.01) and the greatest tendency present on the Black positive estimate in the clean-dirty - level A condition (4.62). The least amount of underestimation occurred on the Black negative estimate for the lazy-hardworking - level A condition (-.29) and the largest underestimation was on the White positive estimate for the clean-dirty - level B condition (-3.49).

Table 18  
Analysis of Variance for Pro-White Bias

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>
Attitude (A)	2	26341.45	13170.72	53.89*
Trait Content (C)	2	999.82	499.91	2.04
Objective Reality (O)	2	19220.34	9610.17	39.32*
A X C	4	1596.62	399.15	1.63
A X O	4	5863.23	1465.81	5.99*
C X O	4	644.12	161.03	< 1
A X C X O	8	1323.80	165.03	< 1
Error	135	32992.07	244.38	
Total	161	88981.44		

\* $p < .001$

Table 19  
Individual Cell Means for the Two-Way Interaction  
Between Attitude and Objective Reality  
on Pro-White Bias

Objective Reality	<u>Attitude</u>		
	High	Middle	Low
A	20.26	-3.13	-16.56
B	-8.34	-5.55	-28.67
C	33.91	3.21	-0.26

Table 20

Mean Estimation Error Score for the Four Estimates of White Positive,  
White Negative, Black Positive, and Black Negative on Each  
Level of Objective Reality for Each Trait Condition

<u>Level of Reality</u>	<u>Trait Content</u>	<u>White Positive</u>	<u>White Negative</u>	<u>Black Positive</u>	<u>Black Negative</u>
Condition A	Clean-Dirty	0.01	1.76	4.62	-3.04
	Lazy-Hardworking	1.49	-2.36	3.54	-0.29
	Violent-Nonviolent	2.99	1.04	0.35	2.28
Condition B	Clean-Dirty	-3.49	3.56	3.05	-2.80
	Lazy-Hardworking	-1.04	1.98	3.45	-2.32
	Violent-Nonviolent	-1.98	1.63	2.57	-0.86
Condition C	Clean-Dirty	2.40	-1.84	-0.64	2.64
	Lazy-Hardworking	3.37	-2.50	-1.57	3.22
	Violent-Nonviolent	2.64	-1.38	-1.99	1.26

## Discussion

The first hypothesis stating that the effects of the relative magnitude of the figure on number estimations will be minimal has been substantiated. This can be clearly understood by realizing that the mean estimation scores for most of the conditions were very small (indicating that subjects were estimating in the direction of the real magnitude), and that for most conditions there were both negative and positive error scores (meaning that there were both underestimating and overestimating tendencies). The only conditions that resemble the previously reported research in this area were the four estimates in Conditions B and C and the White superior condition for the pro-White bias contrast variable. In these cases, subjects displayed the tendency to overestimate small numbers and underestimate large numbers. However, this trend was not significant since the first and second contrast variables revealed no significant results on the question of accuracy or the effect of the magnitude of the experimental stimuli on estimation scores.

This result supports the earlier research of Smedslund (1963) and Christ and Teichner (1967) who first reported that the effects of magnitude are less (or nonexistent) for meaningful stimuli. The current data extends this previous experimentation by demonstrating that Smedslund's conclusions will apply even if the meaningful stimuli are also ego-



involving to the individual. This latter result tends to clarify the position maintained by Ross and DiLollo (1971) who state that context has powerful effects not only on judgment but also on response scaling. The context in this study would not only be the nature of the meaningful stimuli but also the attitudinal structure of the individual which serves as the anchor point for the judgment and the scaling procedure. According to Johnson and Mullally (1969), a correlation and regression model for category judgments can be applied to this type of situation which clarifies the judgmental sequence. Future research should be performed testing this model on the type of data and judgments specified in this experiment and clarifying the relationship between the Bock model and the Johnson-Mullally model.

The second hypothesis that the effects of the true magnitude on relational judgments of positive and negative traits as attributed to members of a biracial population will not be of sufficient strength to mask the effects of attitude toward the two races was supported. This may not be readily apparent since attitude had a significant effect only on the last contrast variable. However, upon closer analysis, we can see that attitude should not be a significant factor on the other variables. For example, on the "accuracy indicator," previous research has shown (Smedslund, 1963) that everyone is able to formulate relational type of judgments. Likewise,

one would not expect an effect of attitude on absolute-White bias since the only way to acquire such a result would be if subjects made relatively high estimates for both the White positive and White negative categories. Finally, for attitude to reach significance on positive-trait bias, subjects would have had to estimate high values for both White positive and Black positive, a situation unlikely to occur especially for either the high or low attitude groups.

The significant effect of attitude may clarify the relationship between attitude and other individual processes. As noted before, Waly and Cook (1966) and Greenwald and Sakumura (1967) questioned the relationship between attitude and the memory and perceptual processes of the individual. Even though previous research indicated that attitude was a relevant factor and had to be considered in these processes, these two studies raised the question whether attitude was that important; and if it were, its effect may be elsewhere. This experiment tends to indicate that if attitude is not related to the perceptual and memory processes, then it certainly seems to be associated with the cognitive processes of the person. As defined by Smedslund (1963), correlation and the forming of relationships is part of the cognitive system; and as mentioned before, the type of task utilized in this study was more than perceptual and/or memory. Thus, attitude is related to the cognitive structure of the individual

(correlational type of thinking) either in combination with the perceptual and memory processes or in isolation.

Applying this information to prejudiced attitudes, Triandis (1971) describes four stages in the progressive development of attitudes. In the second stage, the person becomes involved in the clustering process - the consolidation of ideas and perceptions into distinct categories and then constructing relationships between these categories. Triandis maintains that the first process is certainly involved in attitude formation and this study would lead one to conclude that the second phase is also significant in the development of at least prejudiced attitudes. Bruner and Perlmutter (1957) noted that when viewing objects similar in all respects except one, this differentiating cue or characteristic becomes critical in the formed impression. From our data, one may conclude that this differentiating cue may also be critical in all judgmental relationships and thus serve as a base for prejudice.

On the topic of prejudice, the third hypothesis that prejudiced subjects overestimate both Black negative and White positive traits and underestimate Black positive and White negative traits was substantiated. This conclusion is formed on the basis of the significant effect of attitude on the pro-White bias contrast variable which is a function of both bias in favor of and bias against the respective races. This

indicates that prejudice may be viewed as a correlational process; and that for highly controversial elements, individuals rely on their attitudinal structures for the formation of judgments. This information expands the conclusion by Smedslund (1963) that people form relationships and judgments without any knowledge of the concept of correlation or of the correlational reasoning process by utilizing non-statistical information. This type of information in the case of controversial material would be previously formed attitudes, and in the case involving race or other objects of prejudice, it would be the factor of established prejudiced attitudinal structures.

As stated by Collins (1970), "We define prejudice as the intensity of negative affect against a particular group and its members" (page 252). This research demonstrates that prejudice involves more than negative affect and all future research and definitions should acknowledge these additional dimensions in conceptualization. In the same vein, prejudice reduction involves more than the changing of a negative attitude into a more positive one. In general, it might be stated that change must involve the object and the subject of the prejudice and the assignment of positive and negative "facts" to each aspect. If this is correct, it may help explain why current techniques in changing attitudes are only minimally successful since most only consider one aspect.

Karlins, Coffman, and Walters (1969) have demonstrated that students' characterizations of their own groups in 1967 were markedly less flattering than in 1951 and Hraba and Grant (1970) found that children preferred dolls of their own race. These two studies lead one to conclude that the more recent changes in racial attitudes (Young, 1966) may be due to the simultaneous enactment of both of the above-mentioned processes. Bayton (1965) at the conclusion of his study hypothesized this same type of relationship with Clark (1963), in his discourse on the development of prejudice, hypothesizing that prejudice is often an inferential or judgmental process. Cole (1969) maintains that any model of attitude structure and change must be multifactor since attitudes are part of the over-all cognitive system. Finally, the mirror-image phenomenon maintains that individuals categorize members of any out-group as bad and members of the in-group as good. This study indicates that prejudice involves more than just this categorization tendency but also deals with the relationship between the four relevant categories.

The last and most important hypothesis concerns the applicability of the Bock model to analyzing attitudinal structures - specifically prejudice. The results point out that the model may be employed for all real-life conditions: those involving racial equality as well as those depicting superiority in quantity of one race in relation to the other.

The data also denoted that there was a positive relationship between level of attitude and magnitude of estimation errors for pro-White bias and that there was a curvilinear but non-significant relationship between attitude and magnitude for positive-trait bias.

The structural analysis confirmed the correctness of the equipredictability covariance pattern. The following relations among the elements in the covariance matrix can therefore be assumed: (1) covariance between White positive and White negative = covariance between Black positive and Black negative = variance due to the trait component; (2) covariance between White positive and Black positive = covariance between White negative and Black negative = variance due to the race component; (3) covariance between White positive and Black negative = covariance between White negative and Black positive = variance due to the general ability level component. Inspection of the covariance matrices indicate that variance due to the race component was relatively large compared to variance due to the trait component. This pattern of covariances suggests that if a subject commits an error on a category estimate, he will most probably correct it by making an opposite error on the different race - same trait category. There is a somewhat lesser tendency to correct the error by making an opposite error on the same race - different trait category. In summary, if all

estimates were either extremely pro-White biased or extremely pro-Black biased, one would expect high covariances in the following directions:

	White Positive	White Negative	Black Positive	Black Negative
White Positive	1	—	—	+
White Negative		1	+	—
Black Positive			1	—
Black Negative				1

After careful analysis, we see that the obtained matrices closely resemble this pattern. Although the covariance matrices are helpful in determining relationships, they are of no use in determining the direction of specific errors actually made. The transformation of the scores into the four contrast variables had the asset of not only preserving the relationship between the category errors but also of indicating the direction of error.

Regarding the contrast variables, as noted above, significance was not expected for the accuracy indicator or the absolute-White bias. However, the results on the positive-trait bias were contrary to the findings of Linehan (1970). In her study, mean overestimates of positive traits tended to be higher for the low attitude condition than for the high attitude group. One possible explanation for this difference

is simply that college students were employed in her study whereas servicemen were utilized in this experiment. If this contention is correct, we may assume that college students attempt to formulate a more favorable impression of other individuals. Karlins, Coffman, and Walters (1969) found that many subjects in a college population are reluctant to make generalizations about other groups, while Young (1969) discovered that liberal arts majors tended to be more favorable at least toward Blacks than students from other areas.

The significant interaction between attitude and level of reality for pro-White bias demonstrated that the high attitude group reported more White positive and Black negative traits for the racial equality and Black superior conditions and that the low attitude group reported more Black positive and White negative for all three conditions. These results clearly signify a relationship between attitude and judgments. In each reported case, the subject estimated according to his own "internal matrix" and not the objective stimuli presented to him.

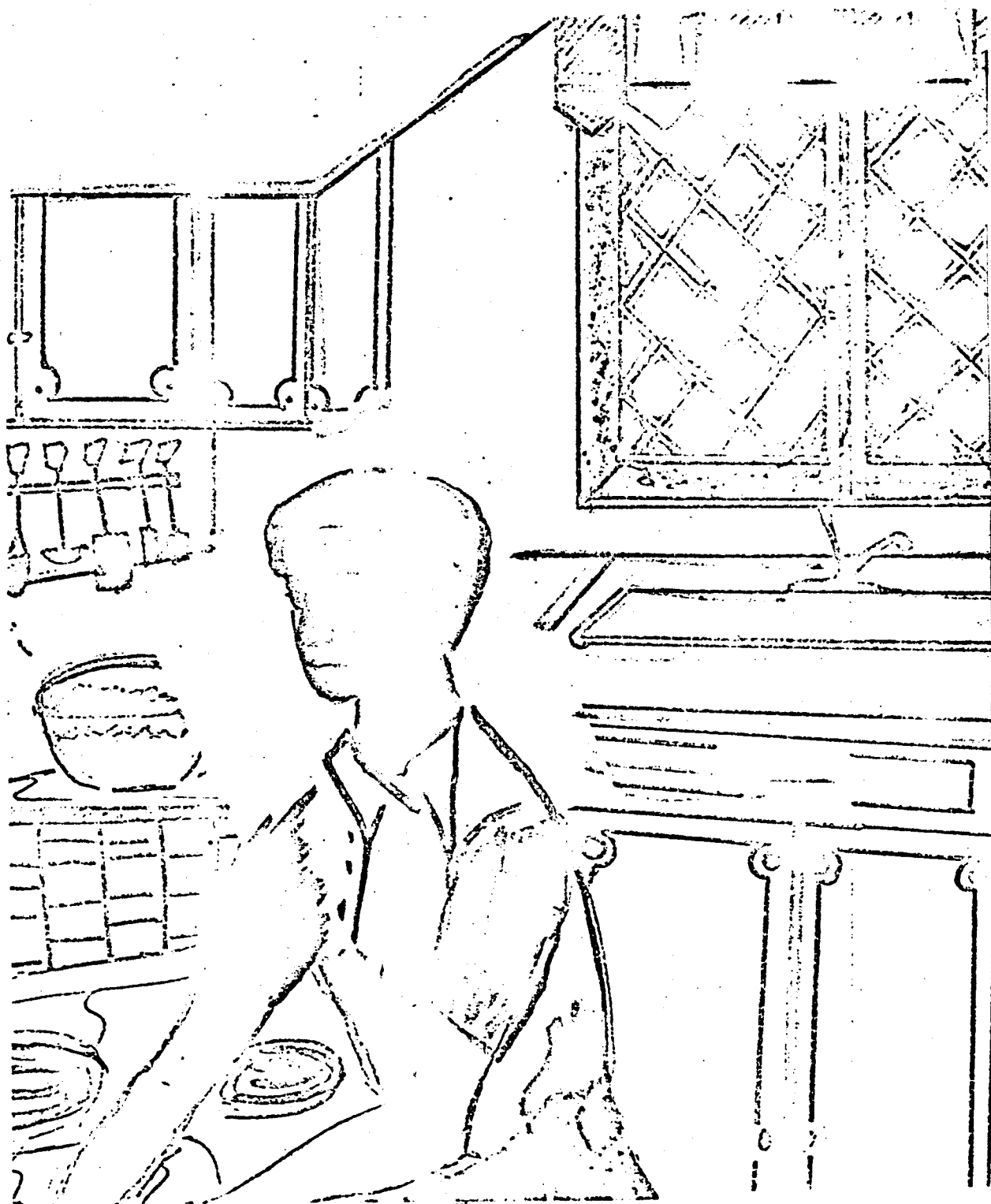
On the topic of attitude scale, Young (1966) states that individuals have a whole constellation of attitudes toward a particular object. The problem is of course which is the best way to combine all the attitudes into one meaningful whole. This study along with the research of Williams (1969) indicates that semantic differential ratings of color names is one

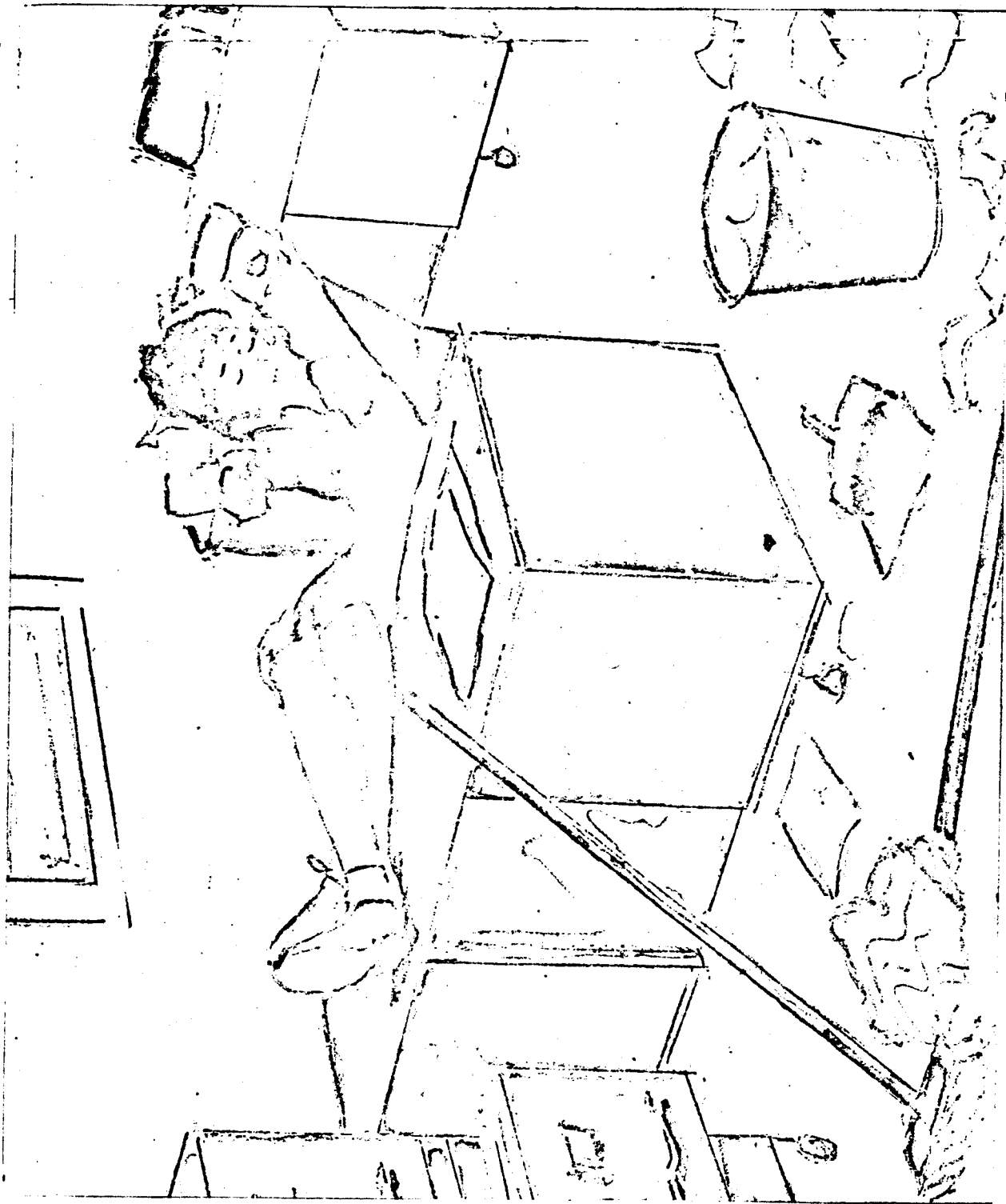


determinant of attitudes toward racial groups. In addition, the computation of a preference score of one race over another should be utilized in future research on attitudes. This is due to the fact that a significant number of Whites rated Blacks more favorably than they did Whites. This is certainly contrary to early research in the area which found own race preference greater than other race preference (Morland, 1962; Landreth & Johnson, 1953; Stevenson & Stewart, 1958; Gilbert, 1951; Horowitz, 1936; Katz & Braly, 1933). However, many recent researchers have disclosed this tendency decreasing. Bettelheim and Janowitz (1964) noted a decline over the previous two decades in derogatory stereotyping of Blacks; Karlins et al. (1969) confirmed this tendency and pointed out an increasing tendency for Whites to categorize themselves in less flattering terms; and Ostrom and Upshaw (1970) discovered a shift toward more pro-Black attitudes. However, none of these studies actually found preference for the other group higher than preference for one's own group. The results of this project certainly indicate that this previous assumption is at best dubious. Hopefully these results indicate that American attitudes are changing - that Whites are eliminating racism toward Blacks; and as noted by Freidman (1969), Blacks are developing a more positive self-image especially through the "Black is beautiful" movement and the improved view of Africa and Black history.

In summary, this experiment demonstrated that for meaningful stimuli, relative magnitude has minimal effect on estimations, that attitude is a significant factor in forming judgments, that prejudiced subjects overestimate both White positive and Black negative traits and underestimate Black positive and White negative traits, that Bock's model may be applicable to the analysis of attitudinal structures, and that future research may not assume preference for one's own group over that of the other group. In addition, the results suggested that future research is needed on the various types of models explaining number estimations, that attitudes may not only be related to perceptual and/or memory processes but also to the cognitive system of the individual, and that the definition and changing of prejudice and other attitudes should include extra dimensions.

APPENDIX A  
SAMPLE ILLUSTRATIONS OF THE CLEAN-DIRTY,  
LAZY-HARDWORKING, AND VIOLENT-  
NONVIOLENT STIMULI







## APPENDIX B

## INSTRUCTIONS FOR THE CLEAN-DIRTY CONDITION

## PROBLEM 1

There are six problems in all; and for each problem, there is one set of stimuli which I will show you. After you have seen the stimuli, you are to answer some questions based on the set of stimuli which you have just seen.

For the first set of pictures presented, there has recently been quite a controversy concerning whether White people or Black people keep their houses up better. The Metropolitan Commission on Urban Affairs undertook a study of the problem. A team of both Black and White real estate agents rated a large number of Black homes and a large number of White homes. If a home received above a certain score, the Metropolitan Commission called it Clean; on the other hand, if a home received below a certain score, it was classified as Dirty. For the purpose of this study, we took the data from the Commission's Report and constructed pictures to represent the results. There are four different types of pictures which you will see: one representing Black Clean; one representing Black Dirty; one representing White Clean; and one representing White Dirty.

The first set of pictures which you will see represents just one cross-section of the homes rated in this study.

There is one picture for each home. Each picture tells you the homeowner's race, White or Black, and his/her home up-keep rating, Clean or Dirty.

As mentioned before, there are six problems (or six sets of pictures which you will see) and each set represents a different cross-section of the homes rated in this study. Each picture will be shown to you very quickly; so I ask that you look at the screen in the front of the room and be very attentive, especially to the homeowner's race and his/her up-keep classification. After all the pictures from one set have been flashed, you will be given some questions to answer. Special instructions will be given to you at that time.

Remember that this is a test of first impressions; do not try to count the pictures. Look at the pictures very carefully and try to form a general impression.

## PROBLEM 2

I will now show you another set of pictures. This set represents a different cross-section of homes rated by the Metropolitan Commission on Urban Affairs. There is one picture for each home and each picture tells you the homeowner's race and his home up-keep rating.

Please turn to the next page in your test booklet and answer the next four questions based on the set of stimuli



which you have just seen.

PROBLEM 3

Same as Problem 2

PROBLEM 4

Same as Problem 2

PROBLEM 5

Same as Problem 2

PROBLEM 6

Same as Problem 2

## APPENDIX C

## INSTRUCTIONS FOR THE LAZY-HARDWORKING CONDITION

## PROBLEM 1

There are six problems in all; and for each problem, there is one set of stimuli which I will show you. After you have seen the stimuli, you are to answer some questions based on the set of stimuli which you have just seen.

For the first set of pictures presented, the National Association of Consultants to Employers conducted a survey on the work habits of American White men and women and American Black men and women after passage of the Equal Opportunity Act. A large group of workers were studied and each worker was rated on both efficiency at work and the number of hours worked per week. If the two ratings added together were above a certain score, the worker was classified as Hardworking; on the other hand, if the two scores added together were below a certain score, the worker was called Lazy. For the purpose of this study, we took the data from the Association's Report and constructed pictures to represent the results. There are four different types of pictures which you will see: one representing Black Hardworking; one representing Black Lazy; one representing White Hardworking; and one representing White Lazy.

The first set of pictures which you will see represents

just one sample of the workers rated in this study. There is one picture for each worker. Each picture tells you the worker's race, White or Black, and his/her work rating, Hardworking or Lazy.

As mentioned before, there are six problems (or six sets of pictures which you will see) and each set represents a different sample of workers rated in this study. Each picture will be shown to you very quickly; so I ask that you look at the screen in the front of the room and be very attentive, especially to the worker's race and his/her work classification. After all the pictures from one set have been flashed, you will be given some questions to answer. Special instructions will be given to you at that time.

Remember that this is a test of first impressions; do not try to count the pictures. Look at the pictures very carefully and try to form a general impression.

## PROBLEM 2

I will now show you another set of pictures. This set represents a different sample of workers rated by the National Association of Consultants to Employers. There is one picture for each worker and each picture tells you the worker's race and his/her work classification.

Please turn to the next page in your test booklet and answer the next four questions based on the set of stimuli

which you have just seen.

92.

PROBLEM 3

Same as Problem 2

PROBLEM 4

Same as Problem 2

PROBLEM 5

Same as Problem 2

PROBLEM 6

Same as Problem 2

## APPENDIX D

## INSTRUCTIONS FOR THE VIOLENT-NONVIOLENT CONDITION

## PROBLEM 1

There are six problems in all; and for each problem, there is one set of stimuli which I will show you. After you have seen the stimuli, you are to answer some questions based on the set of stimuli which you have just seen.

For the first set of pictures presented, there have been a series of racial confrontations in a small town in Southern Illinois which have recently attracted national attention. Due to the fact that there have been several killings of both White and Black people and since both sides have suffered much property damage, an extensive study of violent behavior among both White and Black people has been conducted by the President's Commission on Violence: Its Causes and Cures. Since arrest records are often not representative of true levels of violence due to possible bias in reporting, the Commission stationed both Black and White observers in this small town for a period of six months. These observers were present at every civil disturbance and their job was simply to record the number of Black persons and the number of White persons engaging in violent behavior. The following forms of behavior were defined by the Commission as being violent:

- (A) throwing of objects
- (B) direct physical aggression against  
another person (i.e. battery/assault)
- (C) throwing or lighting of incendiary  
devices (such as Molotov Cocktails)

If the individual was recorded as performing any of the above acts, the Commission classified him/her as Violent; on the other hand, if an individual was not performing any of the above acts, he/she was classified as Nonviolent. For the purpose of this study, we took the data from the Commission's Report and constructed pictures to represent the results. There are four different types of pictures which you will see: one representing Black Nonviolent; one representing Black Violent; one representing White Nonviolent; and one representing White Violent.

The first set of pictures which you will see represents just one cross-section of the persons present at these civil disturbances in this same town during the period of the study. There is one picture for each person. Each picture tells you the person's race, White or Black, and his/her behavior classification, Nonviolent or Violent.

As mentioned before, there are six problems (or six sets of pictures which you will see) and each set represents a different cross-section of persons present at these civil disturbances. Each picture will be shown to you very quickly;

I ask that you look at the screen in the front of the room and be very attentive, especially to the individual's race and his/her behavior classification. After all the pictures from one set have been flashed, you will be given some questions to answer. Special instructions will be given to you at that time.

Remember that this is a test of first impressions; do not try to count the pictures. Look at the pictures very carefully and try to form a general impression.

#### PROBLEM 2

I will now show you another set of pictures. This set represents a different cross-section of persons rated by the President's Commission on Violence. There is one picture for each individual and each picture tells you the person's race and the person's behavior classification.

Please turn to the next page in your test booklet and answer the next four questions based on the set of stimuli which you have just seen.

#### PROBLEM 3

Same as Problem 2

#### PROBLEM 4

Same as Problem 2

#### PROBLEM 5

Same as Problem 2

**PROBLEM 6**

Same as Problem 2



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APPROVAL SHEET

The Dissertation submitted by David J. Marx has been read and approved by members of the Department of Psychology.

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

The Dissertation is, therefore, accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 18 1972  
Date

Harmer H. Johnson  
Signature of Advisor