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AN INVESTIGATION INTO SOME PERCEPTUAL CORRELATES OF PREJUDICE

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AN INVESTIGATION INTO SOME PERCEPTUAL CORRELATES OF PREJUDICE

By

Donald Reynolds

AN ABSTRACT OF A THESIS

Submitted to
Michigan State University
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ABSTRACT

AN INVESTIGATION INTO SOME PERCEPTUAL CORRELATES OF PREJUDICE

by Donald Reynolds

The object of this study was to ascertain if differences exist in perceptual responses of subjects rated as high or low in anti-Negro prejudice. The equipment used was an Engel stereoscope; the technique was a modified Method of Limits which held exposure time constant while incrementally varying illumination in the stereoscope frames.

Experimental Hypotheses and results were:

1. There should be a difference with respect to the threshold points at which the second field dominates the first between the HP and the LP groups.

Results: Not demonstrated.

2. There should be more fusion and less rivalry for the LP group as compared to the HP group.

Results: Not demonstrated, although there was a trend for the HP to have a higher absolute number of rivalry reports when compared to the LP group.

3. Thresholds for the HP group would be elevated on the W-N series and depressed on the N-W series, due to perceptual vigilance/defense and value orientation considerations.

Results: Not demonstrated. In fact, both the HP and the LP groups had thresholds in the opposite direction from that predicted. (HP less than .01; LP = .05, for levels of confidence.)

Negro stereograms were found to be perceptually dominant. Order effects were ruled out as a serious biasing factor, as was inefficacy of the assessing instrument of prejudice.

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Special thanks are in order to the author's wife, Jeanine Reynolds, for assistance in several phases of the study, and without whose patient understanding in the face of successive obstacles this study would never have been completed.

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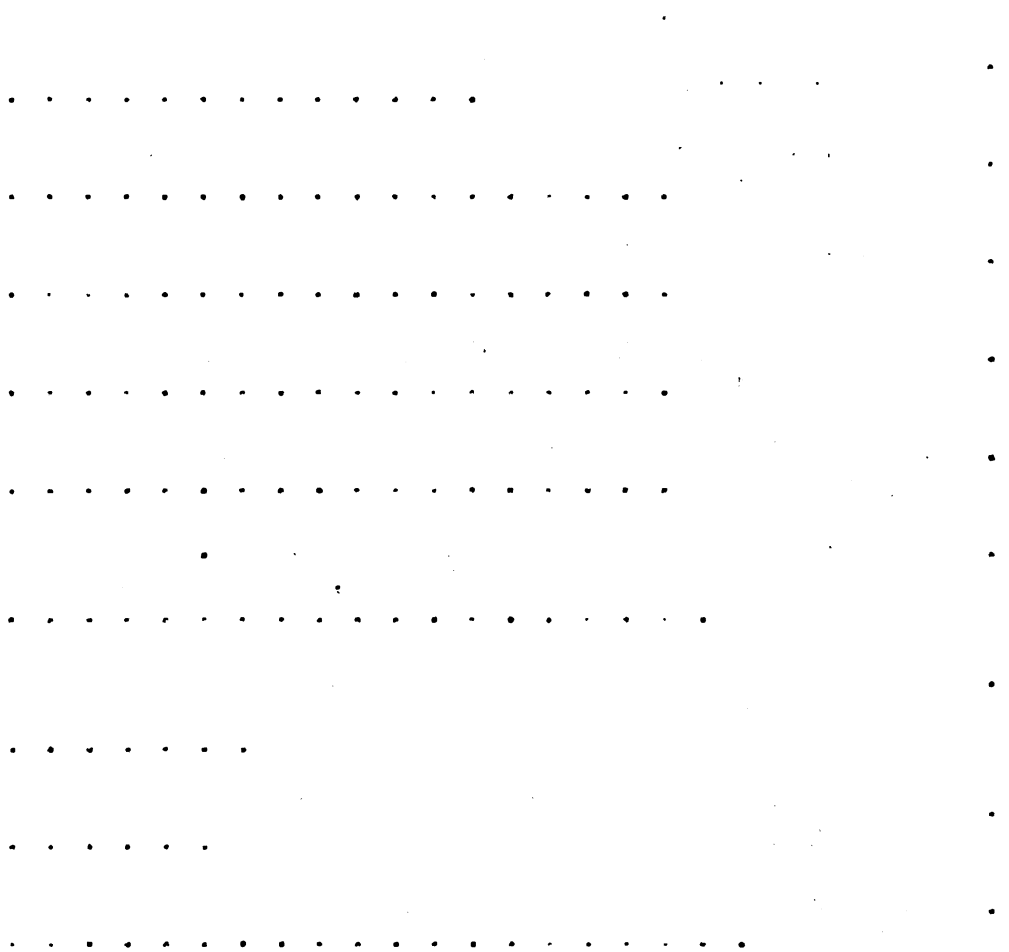

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The object of this study was to ascertain if differences exist in perceptual responses of persons previously rated as either high or low in anti-Negro prejudice. The equipment used was an Engel stereoscope; the technique was a modified Method of Limits.

Binocular Processes

The term "binocular rivalry" has been used in the past to denote two different concepts, one on the stimulus-side and one on the response-side of the perceptual situation. On the response-side, "rivalry" consists of those responses in which the observer reports the alternation of two visual images. The rivalry situation follows from the presentation of different targets simultaneously, one to each eye.

"Binocular fusion" is the integration of two dissimilar targets into one perceived image.

Early Methods of Investigating Binocular Processes

In the first third of the nineteenth century, Wheatstone developed his stereoscope, which he used to investigate depth perception. He was perhaps the first systematic worker in the field of binocular processes. He was followed by Panum, who in 1867 published the first work on retinal rivalry. Breese (1909) used a prism (Brewster) stereoscope in another

investigation of retinal rivalry in the perception of color. He found that:

1. Brighter illumination increases the rate of rivalry;
2. Increasing the distinctiveness or articulation of the stereograms increases the rate of rivalry;
3. Increasing the area of the field presented increases the rate of rivalry; and
4. The further the area of the retina stimulated from the fovea, the greater the rate of rivalry.

Early work in binocular color mixture is reported in Woodworth and Schlossberg (1954).

Perhaps the greatest systematizer of the early workers was Helmholtz, who dealt with Depth Perception, Binocular Diplopia, and Antagonism of Visual Fields in separate sections of his great work, "Physiological Optics" (1867).

Thus, the earliest work in binocular processes was in depth perception and binocular color mixture.

Binocular Processes and Person Perception

Studies using the stereoscope to investigate the role of binocular processes in person perception are relatively recent in Psychology. The work of Engel is among the first. In one study, he found that an upright face dominated the visual field when presented simultaneously with an inverted face in the stereoscopic situation (Engel, 1956). In another study, Engel obtained a pair of photographs of two different people; one photograph he placed in one frame of the stereoscope, and the second of the pair in the other frame. The two faces

were similar in size and position of facial parts, and stimulated roughly corresponding points on the two retinas. He obtained excellent fusion of the two dissimilar faces in this situation (Engel, 1958).

Various individual differences were reported by Engel as to the binocular outcome of viewing the dissimilar photographs; these differences were mainly as follows: "weighting" of one face over the other, left- or right-eye dominant responses, blending or fusion with neither face dominating, and a vertical overlapping and/or superimposition of two distinct faces. The "binocular face" is "usually reported as more attractive than either of the monocular faces" (Engel, 1958, p. 55).

Another study of person perception and binocular processes is that of Beloff and Beloff, which demonstrates support for the role of personal preferences in the products of fusion. A composite (fused) image of a photo of the subject himself in one frame and a complete stranger in the other was judged more attractive than when there were two photographs of complete strangers in the two frames. This fits in neatly with Engel's findings regarding the attractiveness of the "binocular face." Precautions were taken to exclude from the study any subject who recognized his own picture in the former situation (Beloff and Beloff, 1959).

Bagby (1957) used a stereoscope to examine cross-cultural differences in subjects presented different stereograms depicting culturally determined events. The subjects were

Mexican and American (N = 12 in each group), equated for education, socio-economic class, and age. Each subject saw a series of ten stereogram slide-pairs, one of which was a typical Mexican scene, e.g., a bullfight, and the other a typically American scene, e.g., a baseball game. Scenes from the subject's own culture tended to be perceptually dominant. The theory offered was that:

> . . .the Transactional school. . .regards perception as being fundamentally determined by previous, rather than present, experience. . .the role of meaning is accorded a central position in the perceptual processes. . .Thus in the binocular rivalry situation, those impingements possessing a more immediate first-person meaning would be expected to predominate in perceptual awareness (p. 334).

Davis (1959) presented 6 stereograms to 5 male and 5 female psychotic patients (experimental group) and to 10 normal Ss, 6 male and 4 female (control group). Some of the stereograms were of faces or heads, while others were composites, e.g., a photo of a bowl of Rice Krispies, or two girls and a man in a bathing suit. Davis had five response-categories: superimposition, alternation, suppression, admixture, and eye dominant responses. He found that normals make higher scores on superimposition while psychotics make higher scores on admixture. He discussed results in terms of "gating mechanisms," concluding that, "The stereoscopic technique may. . .provide an experimental instrument. . .for the investigation of psychological defense" (p. 401).

Kaufer and Riess (1960), using 49 male and 21 female psychiatrists and allied professional personnel as subjects,

found significant sex differences on stereoscopic perception of different stereograms. They concluded, ". . .the stereoscope can be used to study attitudes which reflect the self-concept of the viewer" (p. 242).

Toch and Schulte (1961), using the Engel stereoscope with 16 advanced Police Administration students as the experimental group and control groups of 27 introductory psychology students and 16 first year Police Administration students, found that advanced Police Administration students perceived significantly more violent scenes when presented with a "violent" stereogram to one eye and a "non-violent" stereogram to the other. The difference between the advanced students and each control group was significant beyond the .01 level of confidence. Thus the hypothesis was rejected that persons disposed toward violence enter Police Administration, but rather that readiness to perceive violence is in some way a function of training. Violent scenes, which for most of us are unusual, become the familiar to these advanced students. The authors note:

> . . .familiar meaning connotations determine perception under non-optimal conditions. . . .A momentary exposure of rival fields in a stereoscope presents a perceptual task in which one set of meanings must be elaborated at the expense of another. If the fields are mutually exclusive (so that they cannot "fuse"), and if neither field exerts itself through structural advantages. . . familiarity clearly becomes the only remaining basis of choice. (p. 392)

Shelley and Toch (in press) investigated readiness to perceive violence in a group of youthful offenders. They

found a widely varying distribution of scores of perceived "violent" scenes. The highest 11 subjects were selected and matched with a control group of the same age and ethnic background. After a time it was found that seven of the 11 "high violence" perceivers had not made a satisfactory adjustment to the camp; some had escaped, and others had to be transferred for disciplinary reasons. The authors see this as demonstrating support for the hypothesis that perception of violence in the stereoscopic situation may indicate a trend to behave violently.

Perhaps the latest reported study is one by Ittelson and Seidenburg (1962) which demonstrates support for the generality of fusion of dissimilar faces in the stereoscopic situation under certain conditions. Two different photographs of persons were presented, one to each eye. Illumination levels were changed as below, using Engel's method:

> At the onset of the presentation only one of the monocular targets is illuminated. The observer, viewing binocularly, is asked to describe what he sees. The illumination is then extinguished and a second presentation is given, but this time the second monocular target is also illuminated. . .to a slight degree. The observer is then asked to state whether any change has taken place in what he sees. Following this. . .the procedure (is) repeated, again adding a slight increment of illumination to the second target. The remarkable thing is. . . the observer reports that he sees the same face as before. . .even after the second target reaches the. . .illumination (of) the first. (Engel, 1961)

Ittelson and Seidenburg (1962) took the illumination change up to the point of equal illumination; at this point 90 per

cent of the cases (97 out of 108 presentations) were reported as having the same face as seen on the first presentation. They then decreased illumination in the previously maximally illuminated frame (thus continuing to strengthen the chance of the second picture intruding in the visual field); in 62 per cent of the cases (67 out of 108) the same face was being reported, when in fact the second face alone was being shown at the end of the series. In this study there were three experimental and one control groups;

> A factorial design was employed consisting of four groups of 12 Ss each. The three experimental groups were exposed first to three sets of similar white male faces followed by a disparate pair of photos, either the W(hite)M(ale)-WF(emale) or the WM-N(egro)M set. These three groups differed. . . in the size of the illumination steps used. . . .A control group was run at the smallest increment level and. . .a disparate pair of photos. . .was exposed first, followed by the three similar pairs. (Ittelson and Seidenburg, 1962, p. 248)

The data was analyzed in several ways; first a three-part division of responses were made into categories of Same (S), Different Before End (DBE), and Different (D), the latter category being used only when the subject indicated that the change had occurred at the end of the series (p. 250). The number of S, DBE, and D responses were tabulated and subjected to a chi-square analysis; it was found that the experimental groups differed from the control beyond the .01 level of confidence. Eye dominance was not a factor, this being subject to a separate analysis. Order of presentation and number of S, DBE, and D reports were also analyzed and found not

significant. A significant difference beyond the .001 level was found supporting the "rather obvious notion that the Engel effect breaks down as the stimulus pairs become more disparate" (p. 253). The authors conclude that the Engel Effect is strongly supported by their investigation as a valid perceptual phenomena; that this effect can be broken down by use of widely disparate stimulus material; that this effect was not an artifact of the procedure (pp. 253-54). They also note:

> The greater tendency for the control group to give significantly more DBE responses is probably directly attributable to the influence of prior exposure of the disparate photos in establishing a set of expectation on the part of the control subjects to perceive changes in the similar pairs. (pp. 251-53.)

All these studies have common strands running through them: they used different stereograms with an exposure time long enough to permit formation of a stable percept; they attempted to assess group or individual differences in binocular processes; experimental and control groups were devised on a priori grounds; all attempted to assess the effect of motivational or experiential factors on stereoscopic perception; all found statistically significant results. While details within the above studies differ, all seem to agree that the effect of past experience, including motivation, is reflected in stereoscopic perception.

Binocular Processes and Prejudice

Adorno, *et al.* (1950), have shown that prejudice is an expression of a particular personality constellation. The foregoing studies suggest the plausibility of a link between personality and perception. If this be true, might there not also be a link between prejudice and perception?

The first exploration of such a link was in a study done in South Africa (Pettigrew, Allport, and Barnett, 1958). This study attempted to determine whether members of different ethnic groups identify each other differentially in the stereoscopic situation. An Engel stereoscope was used; different photographs of both sexes and all ethnic groups in South Africa (four in all) constituted the stereograms. The stereograms were presented in counterbalanced order, each observer seeing each possible pairing of the two-sex, four-race photos. The optimum time of exposure as determined by a previous pilot study was held constant at two seconds; this exposure time was found to be optimally encouraging of fusion. The results were:

1. Afrikaaners, high in prejudice on *prima facie* grounds, experienced less fusion and more rivalry than did any of the other groups (Coloreds, Indians, or Bantus).

2. With the exception of the Bantus, each race identified itself better than it did the other races; there was a high degree of accuracy in "self-group" identifications.

3. Errors tended to cluster in the direction of fusional errors, e.g., seeing a Caucasian-Bantu pair as "Indian," except for the highly prejudiced (HP) group, whose errors were in the direction of seeing more Bantu pictures than would be expected "by chance."

4. All subjects except the HP group made more frequent use of the "Colored" or "Indian" categories; the HP tended to see in terms of "black or white."

5. HP group members tended to "suppress" one of the two-race pairs, e.g., seeing a Caucasian-Bantu pair as either Caucasian or Bantu, rather than fusing them into an "Indian" or "Colored" face. When the pair was Colored-Indian, the HP tended to see more Caucasian or Bantu than would be expected "by chance."

6. Education as a possible biasing factor was ruled out by equating across groups for education.

The authors of the above study point out that, in less than two seconds, observers viewing dissimilar and somewhat ambiguous stimuli in the stereoscopic situation can reach a conclusion about what they have seen with a high degree of subjective certainty. They point out that when errors are made, they tend to be in the direction of preserving the status of one's own group. Thus, an Afrikaaner, having the most extensive investment in maintaining the status quo with respect to the racial hierarchy, tends to bifurcate his judgments in terms of black or white; Coloreds (who in South African law are anyone with less than 100 per cent Caucasian ancestry) tend to make errors in seeing more whites but less Bantus; the same holds for Indians. Only the "lowly" Bantu is "free" to vary his errors indiscriminately. One might add that observers seem to transform the perceptually ambiguous to the subjectively certain in accord with their expectations (hypotheses) based on previous experience (Vernon, 1957).

Allport and Pettigrew (1957) demonstrated the effect of stimulus meaning in perception of motion in a cross-cultural

study using the rotating trapezoidal window illusion. They indicate that the perception of motion in this situation is governed by either "nativistic" (i.e., retinal or cortical) determinants or by the "unconscious utilization of residual experience," or by both, when the conditions are optimal for the illusion to occur. When the conditions are not optimal, then meaning which is based on similar cultural experience helps determine the nature of perceived movement. They state:

> An adequate theory of perceived movement must. . . allow a place for the subject's specific assumptions of meaning even though it cannot be based solely on this foundation (p. 113).

Toch and Ittelson (1956) had previously discussed how the effect of stimulus meaning on perceived motion might be evaluated. They showed that in movement perception loading through meaning, in order to be effective, had to be compatible with "generalized past experience with movement, or with physiological mechanisms underlying movement perception."

Both the Allport and Pettigrew and the Toch and Ittelson studies attempt to show that under ambiguous, sub-optimal or "choice" situations, the role of meaning can be crucial in what is perceived. In this connection Engel (1956) states,

> A theory of perception which holds that sensory organization is wholly prior to, and independent of, content would appear to be contradicted by these (his) results. (p. 91)

Formal Statement of the Problem

The findings of the Pettigrew, Allport, and Barnett study

do not provide a definitive answer to questions which could be asked concerning the relationship of perception and prejudice. A partial list is as follows:

1. Is the phenomenon reported "real" or the result of some artifact, whether of statistical analysis, sampling procedures, or experimental techniques?

2. Can the phenomenon be destroyed using a slightly different methodological approach?

The above two questions are based, in part, on doubts of the wisdom of presenting the same order of stereograms to all subjects. This could easily lead to confounding of results with order effects (Lindquist, 1953). A better procedure would be to randomize slide presentations for each subject.

3. Will the differential patterns as reported generalize to other modes of measurement; will there also be a differential pattern of thresholds which might reflect prejudice?

The above question represents an attempt to quantify the results as reported in the above study. If the phenomenon is "real" it should be possible to obtain some more precise measure of it. The above questions can be restated in a more concise form:

> Is it possible to obtain a quantitative measure discriminating persons rated as high in anti-Negro prejudice from those rated as low in anti-Negro prejudice in a stereoscopic situation when the perceptual stimuli consist of racially dissimilar photographs, and when a modified Method of Limits is used to vary illumination levels while exposure time is held constant?

This question constituted the core problem of this research.

METHOD

Subjects

The subjects were sampled from a pool of six sections of students enrolled in Introductory Psychology classes at Michigan State University. These students were mostly freshmen or sophomores. The total number in the pool was 176.

Apparatus

The apparatus used was an Engel stereoscope, which has provisions for the incremental manipulation of illumination levels for each eye independently of the other eye. In order to equate for size of picture, distance from camera, uniformity of lighting, etc., it was decided to select student identification cards and enlarge them to provide stereograms. In order to safeguard against recognition of familiar faces by experimental subjects,* only those identification cards which were over five years old were selected; the presumption was that those students depicted are no longer in attendance. No photographs were recognized by subjects during the experiment. All photographs were of males.

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*Engel (1958) reports that, in a few cases, pictures which were recognized tended to dominate the visual field, and the characteristics of the so-called "binocular face" were mainly or wholly those of the person recognized.

Research Design

Six sections of Psychology 151 (176 students) were administered a modified Adorno Ethnocentricism (E) scale, with sub-scales including the Negro (N) scale. (Adorno, et al., 1950, p. 142). This scale is included as Appendix A of this paper. The highest 25 and the lowest 25 scores on the N scale constituted the high prejudice (HP) and low prejudice (LP) groups, respectively. The distribution of these scores is included as Appendix B of this paper.

After a lapse of time, about four weeks, subjects were individually contacted to participate in "an experiment on vision." Appendix C provides an indication of the outcome of this process. Only 22 LP subjects were run for various reasons, and the first 22 HP subjects run were taken as the experimental group.

In the experimental situation each subject was given a brief familiarization procedure with the stereoscope, involving focusing for maximum fusion. Subjects were then presented with racially dissimilar stereograms, one in each stereoscope frame, such that, for example, frame number 1 of the stereoscope would have a picture of a Negro, while frame number 2 would have a picture of a white person. Frame 1 would initially be at maximal illumination, while frame 2 would be at sub-threshold values. Thus, at the start, subjects saw only one stereogram, say number 1, although they were viewing binocularly. The presentation just described,

in which the first picture seen was that of a Negro, was called a "Negro-to-white" (N-W) presentation. Exposure time was held constant at two seconds, which Pettigrew, Allport, and Barnett (1958) found optimal for the encouragement of fusion. The method used was essentially that of Ittelson and Seidenburg (1962).* Frame number 2, which was originally at sub-threshold values on the first presentation, was given an increment of illumination on the second presentation. After the second (two-second) presentation, the illumination was then extinguished and another increment of illumination was added. In ten steps or presentations illumination was equal (and maximal) in both frames. Then the following procedure occurred: Frame number 1 was slightly decreased in illumination on the eleventh presentation, while frame number 2 was held constant at maximal illumination. Frame number 1 was thus decreased stepwise for ten presentations until illumination was at sub-threshold level in that frame. It will be noted that, by the twentieth presentation, the subject is now viewing an entirely different face than he was on the first presentation.

Illumometer readings are presented in Appendix D.

Instructions to Subjects

Instructions to subjects were as follows:

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*Report of which reached the author subsequent to completion of the experiment. Ittelson and Seidenburg's method differed slightly in that they did not extinguish illumination between presentations (pp. 249-250).

> I am now going to show you some pictures, one at a time. When I give the signal, look into the eyepiece, using both eyes and keeping your head stationary. As soon as the light goes off, describe the first picture that you see. As I show the picture to you again and again, the picture may or may not seem to change. After each showing I will ask you if there was change, and if so, of what kind. If there was no change, please say "no change" at once, as soon as the light goes out. Between showings, please rest your eyes by closing them. Are there any questions regarding the procedure?

No difficulty was encountered by any of the subjects in mastering this simple perceptual task and complying with the instructions.

Criteria of Change

The subject's reports were recorded as nearly verbatim as possible. These reports were later analyzed for criteria of types of change in accord with the following list:*

1.	Non-related change.	Change NOT related to characteristics of the person viewed. Remarks such as "Picture blurry," or "Out of focus."
2.	Incidental change.	Change related to minor characteristics of the person viewed, e.g., "Ear looked different," or "Tie changed."
3.	Global change.	Change related to global or Gestalt characteristics of person viewed, e.g., "Fuller face," or "He's thinner now."

*The experimenter is indebted to Davis (1959) and H. H. Toch (personal communication) for assistance in establishing the criteria for categories.

4. "Segregation" change. Change related to rivalry or superimposition effects, e.g., "I see a white man at first but he fades into a Negro," or "It's white on the one side but Negro on the other."

5. Fusion change. Change related to fusion of two faces, e.g., "He looks Mexican (or Puerto Rican) now." Also a change in total facial character without reference to race.

6. Complete Dominance. Change related to either a suppression of one face before the end of the series of presentations, or at the end of the series.

The level of illumination differential at which any of the above changes occurred was noted in an appropriate place on the prepared form which was used to record the subject's verbal comments. Interjudge reliability computed on ten randomly selected protocols is presented in Appendix E.

Methodological Safeguards

1. To minimize the danger of subjects' associating the previous testing with the experimental situation, the E scale was NOT administered by the experimenter.*

2. A time lapse of about four weeks was permitted between administration of tests and contacting of subjects in the hope that this would also increase the chances of the two situations being kept separate.**

3. A "cover story" was given the subjects as explanation for the recruitment by the experimenter. The innocuous story was designed to minimize the chance of refusal to

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* Thanks are in order to Dr. D. M. Johnson, for suggesting this procedure, and to D. H. Mills and A. Singer for kindly administering the E scale.

** The effectiveness of these safeguards are hinted at by the fact that only one subject asked the E if the experimental situation had anything to do with the previous testing.

participate by the subjects due to anxiety-arousal centering on the emotionally charged word, "prejudice."

4. It was assumed that eye dominance would be present in most subjects, and since eye dominance apparently cannot be trained or changed by training (Toch, 1960), an additional control was provided by randomizing for each subject the fully illuminated frame of the stereoscope to be presented to each eye, and the race of the person which would be initially viewed. The random orders were different for each subject to randomize out systematic errors (Lindquist, 1953).

5. Inasmuch as the attitude of the E was assumed on a priori grounds to have a biasing effect on the data should he be aware of the group-identity of any individual subject, the experiment was run "blind;" subjects classed as HP or LP were unknown to the E until the experiment was concluded.*

Experimental Hypotheses

It was hypothesized that the means of the HP and LP groups would differ with respect to the point at which the second picture completely dominated the first field. It was possible to muster evidence in support of an hypothesis of either depressed or elevated thresholds for the HP as compared with the LP group.

1. Evidence for elevated HP thresholds. The correlation of conservatism, mental rigidity, and emotional investment in maintaining the status quo in the prejudiced person have been pointed out by Adorno, et al. (1950), and Rokeach (1948). In the general context of person perception, Ittelson and Slack (in Tagiuri and Petrullo, 1958) state:

> In general, it can be said that we have an emotional investment in the stability (italics added) of certain properties of things such that when our expectancies are violated we feel anxious (p. 216).

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*For service above and beyond the call of duty, acknowledgment is here made to the author's wife, who assisted in the randomization of subjects process.

Consideration of the above could lead to the inference that the HP group would tend to "hang on" to what is perceived, especially when that which is perceived is in the process of changing.

2. Evidence for depressed HP thresholds. There seems to be some evidence regarding the depression of HP thresholds. Allport and Kramer (1946) speak in terms of the increased sensitivity of the HP to minority groups, due to the relatively large concern of the HP with racial classification as a means of mobilizing energy to deal with "the enemy" as soon as he is perceived (p. 17).

In addition, Pettigrew, Allport, and Barnett (1958) found that the HP experience less fusion and consequently more rivalry when compared to the LP group(s). This finding, it was felt, if general, would tend to depress the thresholds for the HP. This is due to the fact that fusion, more common in the LP group, postpones the time at which suppression (or dominance) occurs, if indeed it occurs at all (Cf. with Ittelson and Seidenburg, 1962, in which the same face was reported "to the bitter end" in 62 per cent of the cases).

It may be noted in passing that the experimental procedure is designed to encourage fusional effects. The two-second exposure time, the method of altering illumination, the selection of uniformly photographed stereograms, etc., all act to decrease the chance of rivalry phenomena.

3. Resolution of the evidence. In view of the conflicting evidence leading to an equivocal prediction of thresholds in this experimental situation, it was decided to make a two-tailed test of the hypothesis, merely hypothesizing that there should be a difference, but not specifying the direction of the difference. This is formally stated as:

Hypothesis #1: There will be a quantitative difference in threshold points of complete dominance of the second field of the HP and the LP groups.

It was felt that a possibility existed for finding a difference within the threshold reports of the HP person, which would cancel out when averaged. This difference would be that the presentation W-N (white-to-Negro) would be held longer and resist disturbance by intrusions of the Negro picture. Conversely, on the N-W presentations, the image of the Negro would be readily given up for that of a white person, with the consequent lowering

of thresholds. It was not felt that this would be the case for the LP person, due to his relatively small concern with racial classifications (Allport and Kramer, 1946, p. 17).

A general hypothesis was formulated, from which two testable hypotheses were deduced:

General Hypothesis: Thresholds for the HP group would be elevated on W-N series, and depressed on N-W series.

Hypothesis #2: The above effect would be seen when the two types of presentations (W-N, N-W) for the HP were compared to each other.

Hypothesis #3: The above effect would be seen when the two types of presentations for the HP were compared to the two types of presentations for the LP group.

Based largely on the findings of the Pettigrew, Allport, and Barnett study (1958), it was also hypothesized:

Hypothesis #4: The HP will experience more rivalry and less fusion than will the LP group.

Rationale for the Use of the Stereoscope

The use of the stereoscopic, rather than the tachistoscopic, method of arriving at thresholds seems exceptionally well suited to work of this nature. When the tachistoscopic method is used, the problem of accuracy of report is always present. Did the subject actually "see" the stimulus presented to him, or was he interpreting an ambiguous stimulus? This question occurs to a lesser extent in the stereoscopic method, since the subject is given time to form a stable percept; also, the subject is usually unaware of the stimulus conditions. Since the stereoscopic presentation of different

stimuli to each eye involves a choice (albeit an unconscious one) on the part of the subject as to what he will "see," the implications of what is reported are noteworthy in terms of the contribution of the perceiver. In the tachistoscopic method, one is never quite sure what is "seen" and what is interpreted by the subject; in the stereoscopic method there are two images objectively "there," and the resolution of this perceptual situation may throw light on individual differences in handling conflicting and/or conflictual material.

RESULTS

Table 1 presents an overview of threshold differences between the HP and LP groups for all criteria of change. It will be noted that there were no statistically significant differences found between the HP and LP groups. The mean difference between the groups on change number 5, fusion-related changes, just failed to reach the .05 level of significance. All tests were two-tailed, independent t-tests.

Results Pertaining to Hypothesis #1

Hypothesis #1 stated that there would be a quantitative difference in threshold points of complete dominance of the second field between the HP and the LP groups. Change number 6, Table 1, shows that the results of a t-test comparing these two means failed to reach the .05 level of significance.

Results Pertaining to Hypothesis #2

Hypothesis #2 stated that thresholds for the HP would be elevated on W-N series and depressed on N-W series of presentations, when means of these two series for the HP were compared to each other. Part 1, Table 7, shows that these means did indeed differ well beyond the .01 level of significance, but in the direction opposite to that predicted by

the experimental hypothesis.*

Results Pertaining to Hypothesis #3

Hypothesis #3 stated that the thresholds for the HP would be elevated on the W-N series when compared with the LP group, and depressed on the N-W series when compared with the LP group. Table 1, change 6 (W to N) and change 6 (N to W) shows that this was not the case; although the HP were slightly higher than the LP with respect to threshold point of complete dominance of the second field on the W to N series, they were also higher on the N to W series, contrary to what was hypothesized. Hypothesis #3 failed to receive support at the .05 level of significance.

Results Pertaining to Hypothesis #4

Hypothesis #4 stated that the HP would experience less fusion and more rivalry than the LP group. The results reflecting this hypothesis are shown in Tables 2 and 3. It will be noted that, when the number of subjects reporting fusion and rivalry are compared across both groups, there is no difference between the groups (chi-square = 0). When the number of reports of fusion and of rivalry are considered, the picture changes somewhat. While there seems to be no

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*This test was an independent, two-tailed t-test, which was applied because the matched t-test was inappropriate for this data. This was due to the fact that randomization of presentations for each subject did not result in an equal number of W-N and N-W presentations. It should be noted, however, that the independent t-test in this case is biased on the conservative side.

difference between the groups in terms of fusion reports (HP = 22, LP = 24), there does seem to be a strong trend for the HP to have more rivalry reports than the LP (HP = 52, LP = 37). Since not all subjects reported rivalry and/or fusion, a chi-square test is inappropriate to test these findings.

Incidental Findings

Table 4 shows the number of subjects reporting minor intrusions in the first field by groups. A chi-square analysis between HP and LP subjects reporting such intrusions failed to reach the .05 level of significance.

Table 5 shows the number of subjects reporting global (Gestalt-like) changes of the first field by groups. A chi-square test failed to reach the .05 level of significance for this analysis.

Table 6 shows the number of subjects reporting fusion versus the number reporting rivalry, summed across both groups. A chi-square test failed to reach the .05 level of significance for this analysis.

Part 2 of Table 7 shows a comparison of means for the LP group with respect to point of complete dominance by the second field as a function of W-N and N-W series; this is the same comparison as in Part 1 of Table 7, this time performed with the LP group. It will be seen that there was a significant difference between the means of the LP group at the .05 level of significance.

Table 8 shows the dominance effects of the second field as a function of order of presentation. The means of the first two and last two reports for the HP and the LP groups were compared by means and a chi-square test. This failed to reach the .05 level of significance.

Table 9 shows the rank order of the stereogram means. Although a moderate degree of correlation existed between the two groups (rho = .40), this correlation was not significant at the .05 level.

Table 1.--Points of Change Reported by Groups and Results of Significance Tests

Change	$\bar{X}_{HP}$	$\bar{X}_{LP}$	Results*
1	6.0	5.1	n.s.
2	5.0	5.0	n.s.
3	7.1	6.3	n.s.
4	7.8	6.8	n.s.
5	10.3	7.7	t=1.92, n.s.(.05 p .06)
6 (overall)	15.2	14.6	n.s.
6 (W to N)	13.9	13.4	n.s.
6 (N to W)	16.2	15.5	n.s.

*All tests two-tailed, independent t-tests.

Table 2.--Number of Subjects Reporting Fusion by Group Membership

	Fusion	No Fusion
HI P	13	9
LO P	13	9
	26	18

$X^2 = 0$, n.s.

Table 3.--Number of Supjects Reporting Rivalry by Group Membership

	Rivalry	No Rivalry
HI P	17	5
LO P	17	5
	34	10

$X^2 = 0$, n.s.

Table 4.--Number of Subjects Reporting Minor Intrusions (Change 1)

	Obtained	Not Obtained
HI P	13	9
LO P	11	11
	24	20

$X^2 = .366$, n.s.

Table 5.--Number of Subjects Reporting Global Change (Change 3)

	Obtained	Not Obtained
HI P	21	1
LO P	18	4
	39	5

$X^2 = 2.03$, n.s.

Table 6.--Number of Subjects Reporting Fusion Vs. Number of Subjects Reporting Rivalry, Both Groups Included

	Obtained	Not Obtained
Fusion	26	18
Rivalry	34	10
	60	28

$X^2 = 3.35$, n.s.

Table 7.--Comparisons of Means of Thresholds of Complete Dominance by the Second Field as a Function of W to N or N to W Presentation

1.	For HP group:	W. to N vs. N to W, respectively, 13.9 vs. 16.2; t = 2.674, p less than .01, two-tailed.
2.	For LP group:	W to N vs. N to W, respectively, 13.4 vs. 15.5; t = 1.963, p = .05, two-tailed.
3.	For HP vs. LP group, W to N vs. N to W averaged for each group:	HP = 15.0, LP = 14.4; t = 1.714, p = .08, two-tailed.

Table 8.--Dominance Effects of the Second Field as a Function of Order of Presentation

$\bar{X}$s of Slides	HP	LP
$\bar{X}_{1 + 2}$	16.0	14.6
$\bar{X}_{4 + 5}$	13.9	14.2

Chi-Square = .20, n.s.

Table 9.--Rank Order of Stereogram Means for HP and LP Groups

Stereogram (Slides)	Ranks HP	LP
C	1	1
A	2	3
E	3	4
B	4	5
D	5	2

Note: Slides Presented in order of decreasing thresholds.
Rho = .40, n.s.

DISCUSSION

Ittelson and Seidenburg (1962) pointed out that the Engel Effect can be broken down by the use of widely disparate stimulus material (pp. 253-254). The results of the present study tend to confirm their assertion. With respect to change number 6 (the point at which the second field completely dominates the first), there was a question as to whether or not change number 6 occurred in only 14 per cent of the cases in the present study. The "average" subject, irrespective of group to which he belonged, reported change number 6 at step 15, or at a point at which the luminosity of the second field was 4.27 candles/foot^2 compared with the luminosity of the first field of .65 candles/foot^2. This is five steps before the end of the series, on the average, a point at which field number 1 still has a good deal of illumination. The present experiment also showed that for <u>both</u> groups, the thresholds are <u>lower</u> on the W-N presentations, the "average" subject reporting change number 6 at step 13.6, a point at which the luminosity of the second field is 4.27 candles/foot^2 and the luminosity of the first field is about 1.38 candles/foot^2.

All of the above evidence seems to point in one direction; that the Negro stereogram slides are dominant in the perceptual

situation; not only are they "held on to" longer, but they are seen more quickly (in the W-N series). This finding appears in both the LP and the HP groups, yet the means of the W-N and N-W presentations, when averaged for the HP, do not statistically differ from the means of the W-N and N-W presentations for the LP group, when these grand means are compared.

This explanation that the Negro stereogram slides were perceptually dominant seems most parsimonious; the fact that both groups had lower thresholds on the W-N presentations (Table 1) seems to further support the explanation.

The present study found no statistically significant differences between the HP and the LP groups when comparing the means of thresholds of point of complete dominance by the second field. This may be explained by questioning the original assumption that these groups should be different with respect to threshold reports. It may be that in this particular situation threshold reports of point of complete dominance are similar for both groups due to physiological processes, rather than attitudinal or motivational processes.

In terms of the rather negative findings the author is forced to conclude that there appears to be no difference between the two groups in terms of the experimental hypotheses. This is not meant to exclude the possibility of finding meaningful, statistically significant perceptual correlates of prejudice. A difference in experimental design might well result in different findings.

In terms of trends in the data, there appears to be some material for further investigation. These trends were:

1. That although both the HP and the LP groups had about the same number of fusion reports, the HP had more rivalry reports than the LP group (HP = 52, LP = 37). This might be interpreted as partial and tentative support of the Pettigrew, Allport, and Barnett (1958) findings with respect to fusion and rivalry.

2. When fusion was reported, it tended to be at higher thresholds for the HP than for the LP group (see Table 1); this may have been part of a larger finding, that is,

3. Threshold reports were consistently lower for the LP group, across every criteria of change except change number 2 (see Table 1). This finding may possibly be interpreted as due to the greater "need" for the HP to be sure before they make a report of experience. This may also tie in with Adorno, et al. (1950), with respect to the relative inflexibility of the ethnocentric personality, with the concomitant resistance to change. It will be recalled that this was considered as one piece of evidence for elevated thresholds in the HP group with respect to change number 6.

4. Individualized response styles seemed apparent; these cut across membership within the HP or LP group. The present study produced some eight major response styles of subjects, ranging from those subjects who reported "no change" up to the point of complete dominance by the second field, i.e.,

change number 6, through those who reported many intrusions, minor and/or major, along the way, finally resulting in the change number 6 report. This individual response style may be correlated with physiological or psychological differences, including:

a. Physical properties of the stimulus. In the present study, perceptual dominance of the Negro stereogram would be included in this category.

b. Response set. Subjects who understood the instructions as suggestive of rather definite changes to occur would tend to perceive change more readily than those subjects who did not place this emphasis on the instructions. Also included in this class would be those subjects who are more "suggestible" than others, assuming an adequate measure of such "suggestibility" could be obtained.

c. Past experience. Into this category would fall such variables as:

   1) Previous familiarity with similar stimuli.

   2) Degree of ambiguity of the stimulus for the individual subject; here the past experience of the subject with the real objects of the percept would be called into play.

One final point: it could be that the instrument used originally to assess prejudice was faulty or subject to various distortions by subjects wishing to give socially desirable answers, with the consequence that there were no "real" HP or LP groups in the experiment. The author does not feel that this could be a major cause of the findings; Appendix B shows that though the distribution of prejudice scores was positively skewed there was a large range in the scores obtained, the two groups being quite discrepant on these scores. The mean HP prejudice score was 46.4, just short of two

standard deviations (s.d.) above the grand mean of prejudice scores, while the mean LP prejudice score was .4, more than one s.d. below the grand mean.

Conclusions

It is possible to state some conclusions based on results obtained in this study as follows:

1. In sequences of stereoscopic presentations up to and including five stereogram-pair presentations, order effects are not a serious biasing factor, provided care is taken to insure the naivete of the subjects and to prevent them from guessing the purpose(s) of the experiment.

2. Threshold points of complete dominance by the second field in this situation for both HP and LP groups were not shown to be demonstrably different using the Engel stereoscope and a modified Method of Limits, when the stereograms were dissimilar, opposite-race (white and Negro) pairs.

3. There was not significantly more rivalry than fusion for the HP when compared to the LP group, when numbers of subjects obtaining each were compared, but in terms of absolute number of such reports, the HP obtained more rivalry than the LP group.

APPENDIX A

PERCEPTION OF SITUATIONS

Name_____Age_____Sex_____Telephone #__

This is an inventory to see how people respond to their impressions in certain situations. THIS IS NOT A TEST. THERE ARE NO CORRECT OR INCORRECT ANSWERS. Since each person sees things a little differently, each person will answer differently.

IT IS IMPORTANT THAT YOU ANSWER WITH YOUR FIRST IMPRESSION AFTER READING EACH STATEMENT. DO NOT "MULL OVER" THESE STATEMENTS, BUT ANSWER THEM AS RAPIDLY AS YOU CAN. DO NOT LOOK BACK OVER PREVIOUS ANSWERS. DO NOT OMIT ANY QUESTIONS. IF IN DOUBT, ANSWER TO THE BEST OF YOUR ABILITY.

On this sheet, opposite the statement number, put a "0" (Zero) if you completely DISAGREE with the statement. Put a "1" if you agree with the statement about 10% of the time, a "2" if you agree with the statement about 20% of the time, and so on, up to a "10" if you completely AGREE with the statement (i.e., 100% of the time). IF YOU HAVE ANY QUESTIONS ABOUT HOW TO SCORE YOUR ANSWERS, ASK THEM NOW.

___1. Certain religious sects which refuse to salute the flag should be forced to conform to such a patriotic act, or else be abolished.

___2. Most Negroes would become overbearing and disagreeable if not kept in their place.

___3. "Beatniks" prove that when people of their type have too much freedom they just take advantage and cause trouble.

___4. The people who raise all the talk about putting Negroes on the same level as the whites are mostly racial agitators trying to stir up conflicts.

___5. I can hardly imagine myself marrying a Jew.

___6. There is nothing about Negroes I like or admire.

GO RIGHT ON TO THE NEXT PAGE

PERCEPTION OF SITUATIONS

___7. Now that the U.N. has been set up, America must be sure that she loses none of her independence and complete power as a sovereign nation.

___8. Negro musicians may sometimes be as good as white musicians, but it is a mistake to have mixed Negro-white bands.

___9. The best guarantee for our national security is for America to have the biggest and best military force in the world, equipped with more and better atomic and hydrogen weapons than our opponents.

___10. The worst danger to real Americanism in the past 50 years has come from foreign ideas and agitators.

___11. Negroes have their rights, but it is best to keep them in their own districts and schools to prevent too much contact with the whites.

___12. There may be a few exceptions, but in general Negroes are pretty much alike.

___13. The trouble with letting Jews move into a nice neighborhood is that they gradually give it a typical Jewish atmosphere.

___14. America may not be perfect, but the American Way has brought us about as close as human beings can get to the perfect society.

___15. It would be a mistake ever to have Negroes for foremen and leaders over whites.

___16. Although I respect some of their qualities, I would never have any Negroes as friends.

___17. It is only natural and right for each person to think that his family is better than any other.

___18. The Caucasian race is superior in every way to all other races.

___19. Puerto Ricans are all right in their place, but they carry it too far when they dress lavishly and go around with white girls.

___20. Manual labor and unskilled jobs seem to fit the Negro mentality and ability better than more skilled or responsible work.

APPENDIX B

FREQUENCY DISTRIBUTION OF SCORES ON THE N SCALE

Scores	Frequency
90-99	0
80-89	1
70-79	2
60-69	0
50-59	4
40-49	11
30-39	17
20-29	25
10-19	47
0- 9	69

$\overline{X}$ = 17.8; s.d. = 15.9; variance = 252.8

$\overline{X}_{HP}$ = 46.4; $\overline{X}_{LP}$ = .4

APPENDIX C

SUBJECTS ORIGINALLY SELECTED FOR PARTICIPATION IN EXPERIMENT WHO DID NOT ACTUALLY DO SO, AND REASONS FOR EACH

Subject #	Group	Reason for Non-Participation
7	LP	Refused to co-operate.
9	LP	Broke five consecutive appointments.
11	LP	Failed to follow experimental instructions.
39	LP	Severe astigmatism in right eye.
47	HP	Vision in one eye only.
48	LP	Ill, dropped out of school.
49	LP	Left school, reasons unknown.

Subjects dropped were replaced with other subjects having identical, or nearly identical scores; when more than one subject was in the same score-class, selection was per a table of random numbers.

APPENDIX D

CONVERSION OF VOLTMETER SETTINGS TO CANDLES/SQ. FT. (MACBETH ILLUMINOMETER)

Step	Illumination Levels in Volt Settings		Luminosity Levels in Candles/Sq. Ft.		Difference in Candles/Sq.Ft.
	Frame 1	Frame 2	Frame 1	Frame 2	
1	20	120	0	-4.27	-4.27
2	30	120	.01	-4.27	-4.26
3	40	120	.06	-4.27	-4.21
4	50	120	.16	-4.27	-4.11
5	60	120	.34	-4.27	-3.93
6	70	120	.65	-4.27	-3.62
7	80	120	1.10	-4.27	-3.17
8	90	120	1.66	-4.27	-2.61
9	100	120	2.46	-4.27	-1.81
10	110	120	3.46	-4.27	-0.81
11	120	110	4.27	-3.46	+0.81
12	120	100	4.27	-2.46	+1.81
13	120	90	4.27	-1.66	+2.61
14	120	80	4.27	-1.10	+3.17
15	120	70	4.27	- .65	+3.62
16	120	60	4.27	- .34	+3.93
17	120	50	4.27	- .16	+4.11
18	120	40	4.27	- .06	+4.21
19	120	30	4.27	- .01	+4.26
20	120	20	4.27	-0	+4.27

APPENDIX E

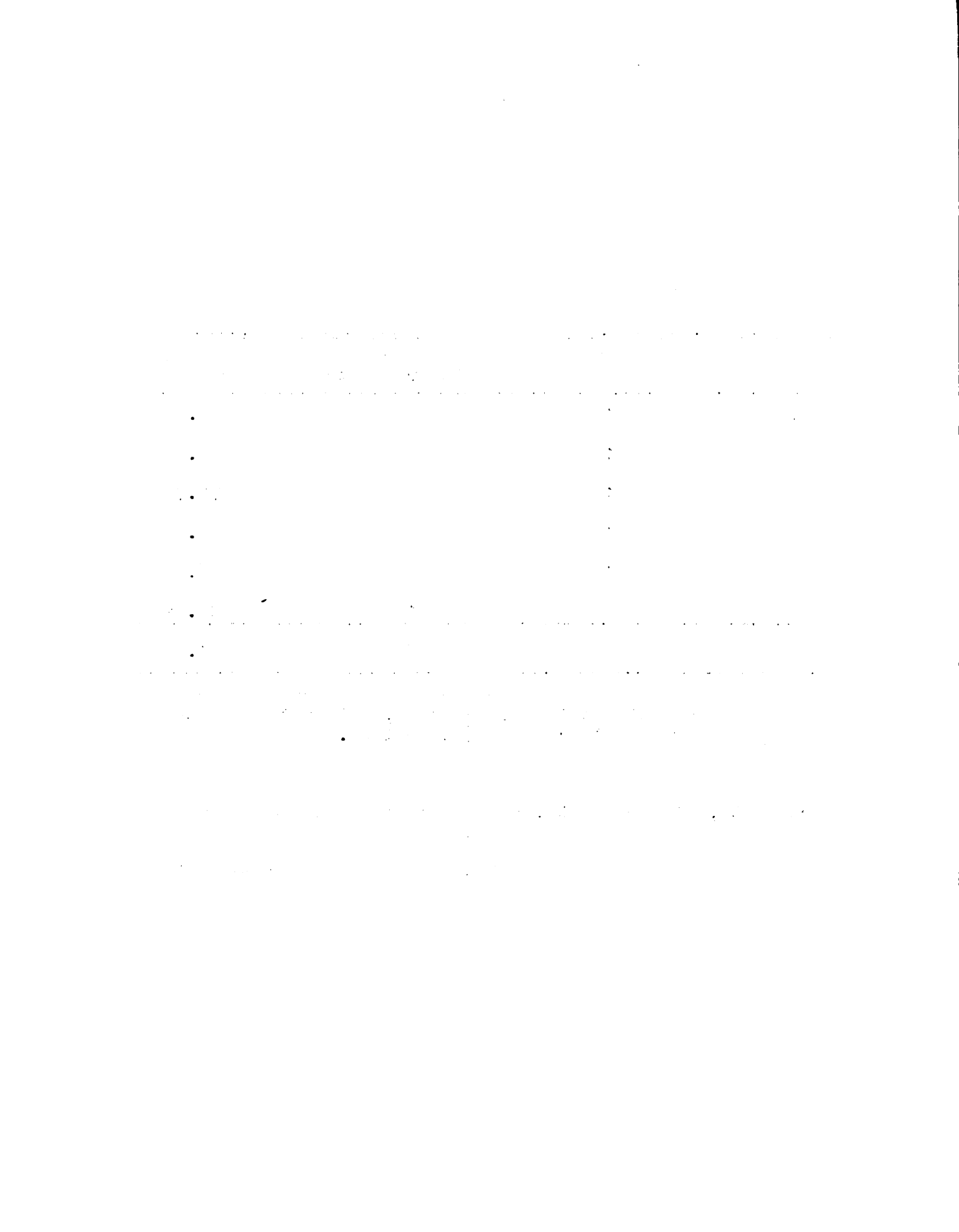
INTERJUDGE AGREEMENT ON SCORING PROTOCOLS

Change #	Number of Agreements	Number of Disagreements	Per Cent Agreements
1	19	3	86.3
2	19	3	86.3
3	16	6	72.7
4	13	9	59.0
5	19	3	86.3
6	9	13	40.9*
Total	95	37	71.9

*Lack of agreement centered primarily about doubts as to whether Complete Dominance occurred, rather than as to the point at which it occurred (see below).

Agreements, Disagreements, and Number of Disputed Occurrences
Change 6

Number of Agreements	Disputed	Disagreements
9	8	5



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