Effects of Negative Comments Upon Size Judgments of Schizophrenics

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Abstract

Groups of schizophrenic patients and control subjects participated in a size judgment experiment. Available perceptual and affective cues were varied in the five experimental conditions presented. Results indicated that variation of available visual cues had no effect on size judgments. Normal and reactive-chronic schizophrenic Ss evidenced increased size judgments in response to critical comments as to their performance of the judgment task, while process-chronic schizophrenic Ss did not alter previously established judgment levels.

This study was conducted while the author was a psychology trainee at the Veterans Administration Hospital, Palo Alto, Calif.

Introduction

Several theorists have postulated relationships between schizophrenic symptoms and perceptual abnormalities (Arieti[1]; Bruner[2]; Cameron[3]; Freud[4]; McReynolds[5]; Rodnick and Garmezy[6]). The fact that many schizophrenics are described as being in poor reality contact has led several of the above theorists to predict that these patients will be less accurate than normals in judging measurable attributes of a physical stimulus. Despite extensive theoretical support for such predictions, results of studies attempting to test these hypotheses have been surprisingly inconsistent. Several investigators report that schizophrenics do not differ significantly from normals on size judgment tasks (Leibowitz and Pishkin[7]; Pishkin, et al.[8]). Other investigators report evidence of overconstancy in schizophrenics (Harvey and Salzman[9]; Maes[10]; Perez[11]; Sanders and Pacht[12]) while additional research indicates that schizophrenics evidence underconstancy of size judgments (Crooks[13]; Hamilton[14]; Wecko-wicz[15]).

Raush[16] has reported a relationship between schizophrenic subclassification, visual cues and size judgments. The results of his investigation indicate that all subjects evidence overconstancy during normal visual conditions, while paranoid Ss evidence reduced constancy under minimal cue conditions. Thus, reduction of available cue conditions appears to differentially

affect the size judgments of sub-groups of schizophrenic *Ss*, and may partially account for the discrepant results reviewed above. Silverman[17] has suggested that many of the present contradictory research reports have resulted from a failure on the part of investigators to carefully group schizophrenic patients along reliable, well defined diagnostic sub-categories, e.g., paranoid—non-paranoid, process-reactive.

A second source of influence upon perceptual measures which has often not been effectively determined and controlled is the effects of the social demand characteristics of the experimental situation. Indeed, Cameron[18] has suggested that the severe social disarticulation apparent in many schizophrenics may create particular difficulties for the patient in dealing with situations or stimuli which have social significance. Reis-man[19] has reported that reactive schizophrenics are motivated to avoid threatening negative social reinforcement, whereas process schizophrenics are not. He concluded that the need to avoid social censure is characteristic of reactive patients rather than of schizophrenics considered as a group.

Silverman[17] has utilized the construct of perceptual "scanning" (Gardner, et al.[20]) to attempt to account for apparent inconsistencies in the performance of schizophrenic Ss on perceptual tasks. He suggests that minimal scanning (size underestimation) of disturbing ideational input, and normal scanning of "neutral" sensory inputs is characteristic of process-chronic schizophrenics, while reactive-chronic Ss appear to remain responsive to both ideational and sensory aspects of the environment. However, under "extraordinary" stress conditions, Silverman postulates that all schizophrenic Ss will evidence ideational gating.

Several hypotheses were derived from the investigations reviewed in the preceding section:

(1) Reactive-chronic schizophrenic and normal Ss will evidence increased size judgments under reduced cue conditions, while process-chronic Ss will evidence a decrease in sige judgments, as compared to judgments made during maximal cue conditions.

(2) Social censure (criticism of per formance) will result in decrements in performance of a size judgment task for process-chronic and reactive-chronic Ss, relative to normals. This will be especially marked among reactive chronic Ss.

METHOD

Apparatus

The apparatus consisted of two light boxes, one presenting the standard and the other the variable stimulus. The boxes were 32 inches in length and nine inches square at each end; both were coated with natural varnish. Each was situated upon 36-inch-high tables, and placed in front of a 52-inch-square black cardboard background. The standard light box was placed directly in front of the subject *(S)*, approximately 12 feet across the room. The variable light box was situated approximately 18 inches from the S, and 45° to the right of the standard source. Two 10-watt concentrated arc lamps (Sylvania ClO-DC) were situated in the rear of the light boxes to provide light of uniform brightness for the standard and variable stimuli.

Size judgments were determined by having the Ss compare two circles of light. Standard stimuli were fixed circles of light (three cm., four cm., six cm. in diameter) presented in random series within each experimental condition. The standard stimuli were projected on to an eight-inch-square milk glass screen mounted on the front of the standard box. The diameter of the standard was varied by means of a series of black cards, with circles of appropriate

diameter cut in the center, placed in front of the standard glass screen. The variable stimulus was also projected on to an eight-inch-square milk glass screen mounted on the end of the variable light box. The size of the variable stimulus could be varied from 1-15 cm. in diameter.

Subjects were able to control the size of the variable stimulus by turning a crank mounted on the side of the variable light box. The crank was connected to a spiral track upon which was mounted a metal square with a circle cut in the center. Turning the crank moved the metal square either toward or away from the light source; this in turn either increased or decreased the diameter of the circle of light projected on to the screen of the variable light box. By turning the crank away from himself, the S would move the metal disc closer to the light source and increase the diameter of the circle projected on the screen of the variable box. Turning the crank toward the S had the opposite effect. The starting point diameter of the variable stimulus was randomly varied between each size estimation trial in order to counteract possible reliance upon kinesthetic cues in making size judgments.

Subjects were in-patients, or ward attendants at the Veterans Administration Hospital, Palo Alto, Calif. All Ss were tested for both binocular and monocular visual acuity, and had at the minimum 20/25 vision, corrected or uncorrected. Those Ss whose vision had been corrected were required to wear their glasses throughout the procedure.

Subjects were categorized into three groups of 10 Ss each:

Group I—process-chronic schizophrenics

Group II—reactive-chronic schizophrenics

Group III—normals

Subjects in Groups I and II were selected according to the following criteria:

(a) Most recent chart diagnosis.

(b) Social history data derived from hospital files and a brief interview conducted by the experimenter.

(c) Scores on the Phillips prognostic scale, as independently completed by an assistant based on interview material (score of 15 was the cut-off point between process and reactives).

(d) Total years hospitalization (minimum three years).

Group III Ss were selected on the basis of sex (all males) with no history of psychiatric hospitalization or neurological disorder.

Schizophrenic Ss observed or reported to be currently exhibiting paranoid delusions, by the ward staff or during the two pre-test interviews conducted by the experimenter and his assistant, were not included in the experimental groups. This restriction was adopted to control for the possible interaction between the process-reactive dimension and paranoid symptomatology suggested by Silverman.[17] No acutely disturbed Ss were included in the experiment. Most Ss exhibited apparent symptomatic remission of overt psychotic behavior.

Procedure

The S was led into a darkened room approximately 12 feet wide by 15 feet deep. Black cloth was draped over the window shades to effectively shut out external light. The S was seated behind two wooden reduction screens 20 x 24 inches high. Each screen had a central viewing tunnel. The tunnel extending toward the standard stimulus was 13 inches long and 1/2 inch in diameter; the tunnel toward the comparison stimulus was seven inches long and two and one-half inches in diameter. In each instance when looking through the tunnel, the S was able to see an area of approximately

12 inches in diameter. The circles appeared in the center of this area.

Each S made six size comparisons for each of five conditions:

Condition 1: The room was dark except for the light emitted by the two viewing screens. The S's view was restricted by the reduction screens.

Condition 2: The room remained dark. The reduction screens were removed and Ss viewed the comparison and stimuli mo-nocularly.

Condition 3: The room lights were turned on (four overhead fluorescent bulbs, Ken Rad F 40 CW, situated in two fixtures). Ss continued monocular viewing of stimuli.

Condition 4: Room lights were turned on and there was no restriction of view.

Condition 5: The room was dark except for the light emitted by the two viewing screens. The S's view was restricted by the reduction screens. Size estimates were followed by the following sequence of comments voiced by the examiner:

(1) Please try to be as accurate as possible.
(2) That's awful!
(3) I wish that you would at least try to cooperate!
(4) You're really fouling up the experiment!
(5) Can you really see the light?
(6) You're way off!

Stress was presented during minimal cue conditions in order to maximize opportunity for alteration of size judgments. Instructions presented to Ss emphasized a naive attitude. Each S was initially encouraged to turn the crank several times in both directions and to observe its effect upon the diameter of the comparison stimulus. The reduction screens were then fixed in place on tables immediately in front and on the side of the S. A standard stimulus, five cm. in diameter, was presented and each S was permitted to attempt five practice size estimates.

The following instructions were then read to each S; "We are conducting a size judgment study. A number of different circles of light will be presented on the screen directly in front of you, and your job is to try to match each circle with a circle of the same size on the screen to your right, by turning the crank. Some of your judgments will be made while viewing the circles of light through these tubes; other estimates will be made with one, and then both eyes open. We will also turn the lights on and off at various points in the procedure. These changes have nothing to do with your performance. Remember when I signal 'ready,' you view the stimulus in front of you and then try to make the circle to your right the same size. Please try to be as accurate as possible in making your judgments. Any questions?"

Order of presentation of conditions was randomized. The three standard stimuli were presented twice during each of the five conditions, thus Ss participated in a total of 30 size judgments. Upon completion of the constancy task, Ss were interviewed as to their reactions to the experimental procedure. The purpose and rationale for the critical comments presented during Condition 5 was then explained and discussed.

Results

Group averages were calculated for the following S variables: age, education, length of hospitalization and tranquillizing medication dosage.

The average age of S groups was as follows:

Group I (mean 39.6 years, S.D. = 5.2 years)

Group III (mean 44.9 years, S.D. = 6.1 years)

Group III (mean 44.2 years, S.D. = 6.7 years)

Education levels were:

Group I (10.7 years, S.D. = 4.4 years) Group II (12.1 years, S.D. = 3.6 years)

Group III (12.6 years, S.D. = 4.1 years)

Daily tranquillizing medication dosage, in Thorazine equivalents, were as follows: Group 1 (456 mgm., S.D. = 41.6) Group II (477 mgm., S.D. = 51.7)*

All Ss had been started on medication a minimum of 10 days before testing. Average total years of hospitalization were: Group I (6.8 years) Group II (5.3 years)

Individual size estimates were read off an indicator located on the side of the variable stimulus box. Thus, the data was obtained and treated in terms of the diameter of each size estimate. Group size estimates are presented in Table I.

TABLE I

GROUP SIZE ESTIMATES: STANDARD STIMULI COMBINED
AVERAGE DIAMETER 4.33 CM.
CONDITIONS

Groups	1		2		3		4		5	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
I	5.23	.87	5.21	.61	5.33	.76	5.43	.71	5.37	1.12
II	5.50	.91	5.47	.83	4.98	.83	5.38	.93	6.78	1.23
III	5.76	.53	5.62	.45	5.41	.47	5.29	.62	6.14	.71

All groups evidenced overconstancy of size estimates. This finding is in accordance with previous research[21,22] findings which indicate a tendency for overconstancy to occur in the laboratory. Raush[16] had determined two aspects of the procedure utilized here which have been demonstrated to result in overconstancy: (1) the standard was the far object and the variable the near object and (2) the 90° angle of disparity between the standard and variable sources.

Experimental conditions introduced the stress variable at only one level of visual cue conditions, i.e., minimal cue conditions. Stress was combined with minimal cue conditions in order to facilitate its effect upon size judgments. It was anticipated that stress would affect response bias more clearly than it would actual visual perception. However, introduction of the stress condition at only one level of the four

* Thorazine equivalents calculated in accordance with ratios estimated by Leo Hollister, M.D., V.A. Hospital, Palo Alto, Calif.

visual cue conditions resulted in a confounded design.

Separate analyses were performed on the data in order to separate the effects of visual cue and stress-no stress conditions. A three factor analysis of variance (Groups x Stimuli x Conditions) with repeated measures on one factor was conducted on the data obtained during Conditions 1-4. Results of this analysis yielded a significant effect of stimuli ($F = 7.61$; $df = 2/81$, $P<.01$).

A second three factor analysis of variance (Groups x Stimuli x Conditions) with repeated measures on one factor, was conducted on the data obtained during Conditions 1 and 5. Results of this analysis indicated a significant Stimulus effect ($F = 6.38$, $df = 2/81$, $P<.01$), a significant Group effect ($F = 3.47$, $df = 2/81$, $P<.05$).

The Turkey procedure was utilized to further test differences between size estimates under stress and no-stress, minimal cue conditions. Comparison of Conditions 1 and 5 indicated that Group II Ss significantly increased size estimates (.05 level) during Condition 5 (stress). Analysis of Group size estimates during Condition 5 indicated a significant difference between Group I and Group II size judgments (.05 level).

Discussion

Results indicate that all Ss evidenced overestimation of standard stimuli during each of the five experimental conditions. It was anticipated, on the basis of previous research (Rausch[16]), that differences between the size judgments of normal and schizophrenic *Ss* would be maximized during minimal cue conditions.

However, the experimental results do not support this prediction. There were no significant differences between size judgments of normal, reactive-chronic and process-chronic schizophrenic Ss during affectively neutral, varied cue Conditions 1-4.

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This finding may be partially explained by the fact that the distance between Ss and standard stimulus was relatively short (12 feet). Weckowicz[15] has demonstrated that distance of the judged stimuli is very important, i.e., the greater the distance, the greater the difficulty of size judgment and the greater likelihood that size constancy mechanisms will fail. Thus greater distances between Ss and judged stimuli may well have elicited differences in constancy judgments between schizophrenic and control Ss.

A second factor which may account for the lack of differentiation between S groups, is related to the level of tranquilliz-ing medication received by schizophrenic Ss. Such medication was not available at the time of Raush's[16] study.

All schizophrenic Ss participating in this investigation were in a state of apparent symptomatic remission, i.e., they were not overtly hallucinating or delusional. All were in adequate contact, at least to the extent that they were able to follow instructions and perform the task at hand. Nevertheless, two reactive-chronic Ss had to be eliminated from further participation when stress-condition comments elicited justifiably angry but paranoid quality replies. Perhaps Ss suffering from more active psychotic processes, with perceptual distur-bances would evidence significantly deviant size judgments under reduced cue conditions.

A second prediction, that both process and reactive schizophrenic Ss would evidence reduced size estimates of the standard stimuli during Condition 5, was also not confirmed. Results indicated that process-chronic Ss did not alter the level of their size judgments in response to the stress condition. Normal Ss evidenced increased (non-significant) estimation of the diameter of the standard stimuli during Condition 5. while reactive-chronic Ss significantly increased the dimensions of their size judgments during the stress procedure.

These findings appear to support those researchers (Rodnick and Garmezy[6]; Reis-man[19]; Zahn[23]) who conclude that the need to avoid social censure specifically characterizes reactives rather than schizophrenics in general.

The fact that differences between stress and no-stress conditions were obtained under minimal cue conditions, where most visual cues of distance were removed, indicates an effect of stress upon response bias, rather than a fact about the visual perception of schizophrenics.

Indeed Eriksen and Price[24] have indicated that size-constancy measures obtained with traditional psychophysical procedures confound response bias and sensory sensitivity. Clark[25] has demonstrated that facilitating and inhibiting instructional sets affect the location of the psychiatric patient's criterion, and thus his response bias, but not his sensory sensitivity. Thus the increased size judgments evidenced by Group II (reactive) Ss in this experiment appear to reflect a difference in attitude toward the subjective costs and values of possible decision outcomes, rather than changes in sensory sensitivity.

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