

PERCEPTION OF ABSOLUTE SIZE IN A DISTORTED ROOM^{1 2}

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The purpose of the present investigation was to study the effect of the South Dakota modification of the Ames monocular distorted room on absolute size judgments.

Raymond (2), in his experiment with quantitative measures of distortion and errors of perceptual judgments in the distorted room, found the distortion produced significant effects on the perception of area.

METHODS

Subjects

Twenty college students, seven female and thirteen male, were used as subjects for this experiment.

Apparatus

The apparatus consisted of a South Dakota modification of an Ames monocular distorted room (1). A line drawing of the apparatus is shown in Figure 1. This room was built on a basis of a 6 ft. by 6 ft. reference room. Each part of the distorted room forms the same visual angle at the nodal point of the eye at an observation point as would the same part of an ordinary room viewed from the same observation point. A stationary observation point was created by placing a chin rest at the front of the distorted room. The stimuli were presented in the two windows at the rear of the room.

Two sets of stimulus cards were also included in the apparatus. Four white squares, measuring 2 in., 2.75 in., 3.25 in., and 4.0 in. were each mounted on 18 in. by 24 in. black cardboard backgrounds. Two complete sets of stimulus cards were made. On the set used for a control study the white squares were mounted exactly in the center of the black backgrounds. On the experimental set of stimulus cards, the white square was mounted in such a position that it would appear to be in the center of the window of the distorted room when it was presented.

Procedure

Each subject was first tested under a control condition before being placed in the experimental situation.

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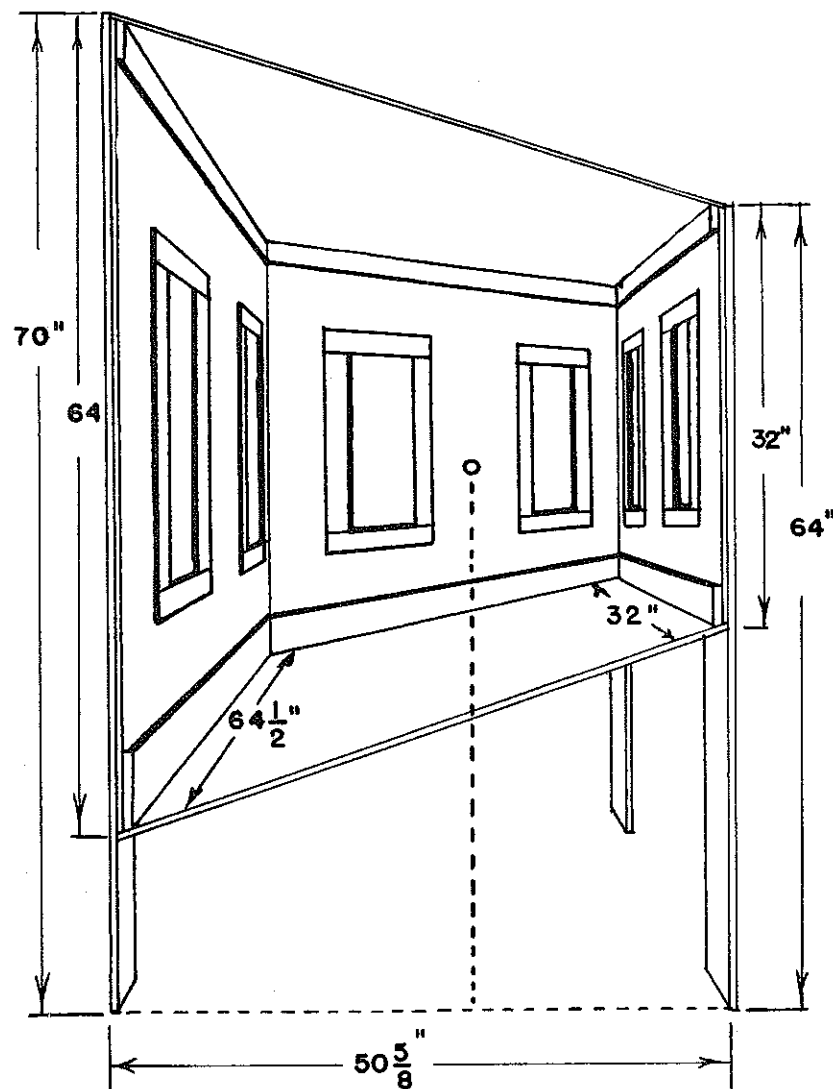


Figure 1. South Dakota Modification of the Ames Distorted Room.

The control condition resembled the experimental condition as much as possible. In both the experimental and control conditions the subject was seated and placed his chin on a rest that was 44 in. from the floor. The distance from the subject's right eye to the stimulus was 57 inches. This distance was equal to the average of the distances between the win-

dows and the subject's right eye as the subject sighted into the distorted room. The stimulus cards were presented so that the center of the white square was 10 degrees to the left of the subject's eye. This formed the same angle as that formed by the subject's eye and the small window of the distorted room.

The cards were presented in randomized order and the subject was asked to make an absolute size judgment in inches. Prior to the presentation of the first stimulus card, a patch was placed over the subject's left eye.

Immediately after completing the size judgments in the control condition, the subject stepped into an adjoining room that contained the distorted room. With his left eye still covered, the subject was presented the four different stimuli in the two different windows interchangeably in a prearranged random order. Each subject made a total of eight size judgments in the experimental condition, four in the large window and four in the small window. Comparisons were made between the size judgments in the two windows of the distorted room and between these judgments and judgments in the control condition. The mean difference "t" test was used to ascertain the significance of judged size differences.

RESULTS

Size judgments of stimuli for individual subjects are shown in the top four graphs in Figure 2.

Size judgments for the 2 in. square did not differ significantly between the large and small windows of the distorted room. Most subjects estimated the size of the 2 in. square in the large window to be the same or slightly smaller than the same square presented in the small window.

Size judgments for the 2.75 in. square in the small window proved to be significantly larger than comparable judgments in the larger window at the 1 per cent confidence level. Similar differences were found in comparisons of the 3.25 in. square in the two windows.

The subjects consistently judged the 4.0 in. square to be smaller when presented in the large window. The difference in size judgments between the large and small window was found to be significant at the 1 per cent level.

The lower graph illustrates the mean judgments of the squares in the control condition and in the two windows of the distorted room. The differences of the mean judgments of the squares in the control condition and large window were found to be significant for the 2 in., 3.25 in., and the 4.0 in. square. The difference in mean judgments for the 2.75 in. square was not significant. No differences were found between judgments in the control and small window conditions. Also, absolute size judgments in the control condition did not deviate significantly from actual stimulus size.

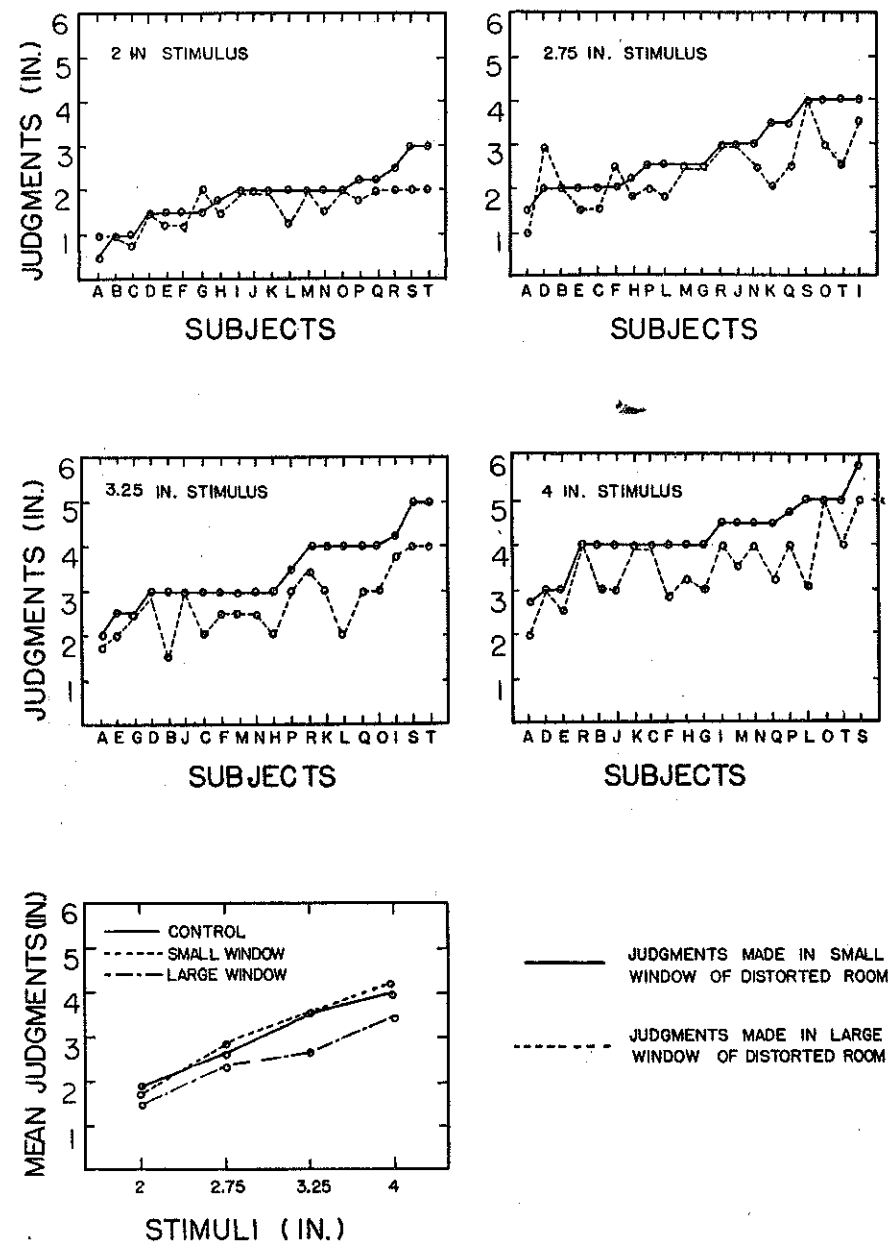


Figure 2. Size Judgment of Stimuli.

DISCUSSION

The subjects showed a definite tendency to judge the stimulus in the large window of the distorted room as being smaller than the same stimulus in the control condition and the small window of the distorted room. This held true particularly for the larger stimulus squares. The distortion effect of the room was not as apparent when judgments were made on the two inch stimulus square. This lack of distortion on smaller sizes had previously been noted by Raymond (3).

These clear cut differences in size judgments indicate that the distorted room has a definite effect on absolute size judgments. This effect can not be ascribed to the distance difference existing between the subject's eye and the large and small window of the distorted room. Raymond (3) previously determined that the difference in distance existing between the large and small window had no effect on judgments.

SUMMARY

Twenty subjects made absolute size judgments in a control situation and in the South Dakota modification of the Ames monocular distorted room.

1. Significant differences in judgment were found using the 2.75 in. square, the 3.25 in. square, and the 4.0 in. square.
2. No significant differences in judgments were found using the 2 in. square.
3. Subjects tended to judge stimulus presented in the large window as being smaller than stimulus presented in the small window of the distorted room and in the control condition.
4. In the control condition, absolute stimulus judgments corresponded very closely to actual values.

BIBLIOGRAPHY

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3. Raymond, R., (personal communication).