explanations based on other theoretical processes.

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NOTES

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2. All t tests are two-tailed.

Hand preference as a factor in the perception of lines displaced from the vertical

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Two experiments were conducted to establish hand preference as a factor in the finding that line orientation influences apparent length of a line. In one experiment, left- and right-handed Ss reproduced by drawing the lengths of stimulus lines displaced from the vertical. In a second experiment, left- and right-handed Ss perceptually compared the displaced lines by the method of adjustment. Data from the second experiment show that hand preference is related to line-length estimation; the first experiment yielded similar conclusions only when interpreted on the basis of motor and cultural phenomena.

Studies on the effect of the orientation of a line on its apparent length have established that lines tilted left of vertical appear longer than lines tilted right of vertical. Although this has been demonstrated to be a reliable finding (Pollock & Chapanis, 1952; Underwood, 1966), no explanations have been offered for it.

Since no mention was made of the hand preference of Ss in the above studies, it can be assumed that the majority were right-handed. As it seems logical to expect a general predisposition of right handers towards the right, it is possible that they perceived left-tilted lines as resisting their natural inclination and, therefore, as extending further away from them than right-tilted lines. If this hypothesis is true, hand preference constitutes a bias precisely in the direction of the findings and should be just the opposite when left handers are used.

The purpose of the following experiments was to test this hypothesis of hand preference as a factor related to the judgment of apparent length of lines displaced to either side of vertical.

EXPERIMENT 1

Method

Slightly varying Underwood's (1966) design, eight principle stimulus lines were used: 1-, 2-, 3-, and 4-in. lengths, all 1/8 in. wide, displaced 45 deg to the left of vertical *(left stimuli)*, and four lines of the same dimensions, displaced 45 deg to the right of vertical *(right stimuli)*; each line was shown on a standard sheet of white paper. Each of the four lengths was presented three times, for a total of 12 left and 12 right stimuli which were presented in random order.

The Ss were required to reproduce the lengths of the stimuli by drawing horizontal lines on standard sheets of white paper, one reproduction on each sheet. Ss, tested individually, sat at a table placed 10 ft from and directly in front of the stimulus display. Ss were cautioned to remain seated erectly and stationary so that their line of regard would be on an even level with and perpendicular to the stimulus display. The experiment was conducted in a medium-bright, matte-finished, phosphorescent lighted room.

Results were assessed in terms of mean constant error, measured to the nearest 1/16 in. Mean constant error was defined as the average of all deviations of the reproduced lengths from the four lengths of the stimulus lines.

Male and female undergraduates volunteered to serve as Ss, 26 left-handed and 29 right-handed. Handedness of Ss was self-designated.

Results

Table 1 indicates that the left-handed group tended to reproduce shorter lengths for the left stimuli than for the right stimuli, while the opposite tendency was noted in the right-handed group. Although these tendencies were as predicted by the hypothesis, the differences in reproduced lengths were not significant. However, when the two groups were subdivided with respect to sex, confirmatory data did obtain for left-handed females ($t = 2.84 > 2.22$ at .05). Further computations disclosed no other effects or significant differences.

EXPERIMENT 2

Method

The task of Ss was to judge equality between standard and variable stimuli according to the method of adjustment. Standard stimuli consisted of 5-, 8-, and 10-cm lines, all 3 mm wide, drawn diagonally on 8½-in. squares of white cardboard, one line on each square. By rotating the squares 90 deg, each diagonal line could be presented four times, for a total of 12 right and 12 left standard stimuli, presented randomly.

Table 1
Positive Mean Constant Errors (1/16 in.) for Right Stimuli (RS) and Left Stimuli (LS) Reproduced by Right- (RG) and Left- (LG) Groups and Left-Handed Females (LF)

	RS	LS
LG	3.89	3.29
RG	6.15	7.63
LF (N = 11)	4.22	2.60

The apparatus for the presentations of the variable stimuli consisted of a cardboard panel (25-in. base and 9 in. high), in the center of which was a window, i.e., a 6 x ¾ in. horizontal slit. Behind the panel was mounted a sliding ruler, on the back of which was pasted a white paper surface marked with a 15 cm x 3 mm black line that appeared through the window. Thus, the length of the horizontal line that appeared through the window (i.e., the variable stimulus) could be read by E directly from the front of the ruler.

The E adjusted the length of the variable stimulus until it was judged by S as equal to the standard stimulus; ascending and descending trials were alternated. On alternate pairs of trials, the standard stimulus was located on either side of the variable stimulus, thus cancelling spatial error.

Results again were measured in terms of mean constant error, measured to the nearest millimeter.

Ss, selected, assigned, and tested as described in Experiment 1, were undergraduate males and females, 26 right-handed and 24 left-handed. (Different Ss served in each experiment.)

Results

Table 2 indicates that the left-handed group perceived the left stimuli as significantly shorter than the right stimuli, and that this trend is just the opposite of that for the right-handed group. It should also be noted that the left-handed group perceived the right stimuli as significantly longer than did the right-handed group ($t = 2.98 > 2.66$ at .01) and the left stimuli as significantly shorter than did the right-handed group ($t = 3.03 > 2.66$ at .01).

Table 2
Positive Mean Constant Errors (in Cm) for Right Stimuli (RS) and Left Stimuli (LS) Perceived by Right- (RG) and Left- (LG) Handed Groups

	RS	LS	t
LG	1.04	.61	$2.81 > 2.80$ at .01
RG	.75	1.09	$2.82 > 2.78$ at .01

DISCUSSION

No doubt differences in methodological procedures account for the fact that only left-handed females yielded data favorable to the hypothesis in Experiment 1, while such data obtained for both major groups in Experiment 2. In Experiment 1, Ss were required to reproduce the perceived stimuli, whereas Ss in Experiment 2 made perceptual comparisons; apparently, the motor task of drawing contaminated the perceptual task in Experiment 1. In short, variations in the data between the two experiments accrued from the different tasks of Ss in each experiment, thus reflecting the well established finding that perception is a function of activity (Kilpatrick, 1961; Wapner & Werner, 1965).

Yet this contamination occurred only among the males of Experiment 1. This might be explained by evidence that right vs left bodily inclinations and activities are, in part, culturally rooted (Buytendyk, 1959); that is, it seems that as a consequence of our cultural expectations of greater motor talent in males than in females, males explicitly strove for motor accuracy in reproducing the lengths of stimuli.

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