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PROBLEM

In connection with studies of human beings upon the span of visual perception, it was observed that some individuals reported immediately following presentation of stimulus pattern but that other individuals reported only after a longer interval of time. Such temporal differences among subjects, made possible in part by the instructions which included no reference to a *time limit* for verbal reports, suggested the possible operation of an uncontrolled factor. It further suggested that perhaps the accuracy of reports is related to the duration between stimulus and report. Our problem has to do with determining the accuracy of reports under two different sets of temporal conditions. In the one case, degree of accuracy is determined for a very short time interval between presentation of pattern and verbal report. In the other case, degree of accuracy is determined for a longer period. The results are compared in order to determine the effect of differences in the two stimulus-report periods upon span of perception.

METHOD

A Whipple tachistoscope was used to present the pattern. Each pattern consisted of a heavy, light-gray cardboard with five-millimeter holes punched in it. The card rested against a dark ground so that the holes were perceived as dark round objects upon a light gray ground.

The holes per card varied in number from five to thirteen and were arranged in random orders. Each number occurred in 10 different patterns, making a total of 90 cards. All cards were presented in chance order. The subjects were asked to observe each pattern with the specific intention of reporting the number

SUMMARY AND CONCLUSION

Span of visual perception was studied under two sets of temporal conditions. In the one case, presentations of patterns were made after instructions to deliberate before reporting. In the other case, more rapid reports were obtained through the instructions to report at an auditory signal coming approximately two seconds after presentation of pattern. This method of reducing the stimulus-report interval decreased accuracy of report. This decrease may be due either to an interruption of the neural basis of the perceptual process before its completion—a disturbance analogous to retroactive inhibition, or to the instruction to report at a signal.

CLAIRVOYANCE, TELEPATHY AND CHANCE

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We report here upon results of studies in which methods of "clairvoyance," "telepathy" and chance determination were used. Zener cards, secured from Dr. J. B. Rhine, were combined in packs of 25 cards—5 each of circle, cross, star, rectangle, and wavy line patterns. Dr. Rhine kindly sent us a mimeographed set of directions by which we were guided in our testing. We were interested in relating scores, which we obtained using clairvoyant and telepathic methods with human beings, with scores obtained using chance methods with dice and shuffling.

CLAIRVOYANCE

In the "clairvoyant" series, the subjects were briefly told of the nature of clairvoyance and methods of studying it. They were then shown the diagrams on the Zener cards and were asked to name one on each experimental trial. The subjects were furnished with a sheet of paper with 25 spaces. The cards were then shuffled and placed face down one at a time by the experimenter upon a sloping surface (reading stand) in clear view of the subjects.

problem was to compare results, obtained from intelligent human beings, with results secured from chance roll of a die or chance shuffling of cards.

RESULTS

The subjects for the clairvoyant series also served here. 110 persons went through 6 lists (660 packs) making a total of 16,500 trials. Five high and five low scorers went through 6 additional lists (60 packs) giving a grand total of 18,000 trials (720 packs). In the chance series, the 720 packs were checked against two times by throwing dice giving a total of 36,000 chance trials. The other chance method—shuffling and matching cards against original telepathic judgments—gave 83,750 trials.

The results are shown graphically in Fig. 2. The distributions are essentially alike; the same holds for the mean values. Chance methods gave scores as high as those for telepathy. High and low scorers in the telepathic series did not continue consistently to give high and low scores in the retesting series.

Our data show that scores gotten from a die or from a shuffled pack of cards (when matched against a set of "telepathic" judgments earlier given by human beings) may be as correct as scores obtained from human beings concentrating "telepathically" upon geometrical patterns of the Zener sort. A die, rolling by "chance," is as telepathic as an intelligent human being when "telepathy" is measured by number of correct hits in a series of 25 trials.

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The scientific significance of certain perceptual spatial patterns seems not to have been generally recognized by psychologists. The unscientific air of parlor magic and unreality as is revealed in the usual discussion of illusions has obscured clarity of vision.

Psychology can definitely advance its scientific status by drop-

ping the usual treatment of illusions, in which they are regarded as being peculiarly different from other perceptual patterns in terms of which they must of necessity be scientifically regarded. All perceived spatial patterns are cut from common cloth; what holds in particular applies in general. Spatially ambiguous patterns are scientifically significant in part because they reveal in a most striking manner the nature of the psychological changes which occur during functional development. They reveal the emergence of new properties in an environmental object, the sudden appearance of describable characteristics in a thing in the absence of intentional seeking, the actual discovery in an old or familiar object of some feature quite different from other features and which when discovered may be repeatedly observed. The changes which occur in illusions represent a cross-section of the processes involved in functional development. During development every normal individual makes many thousands of discoveries concerning the objects of his environment. New properties are added to old objects and old properties come to characterize new patterns. Psychological growth implies discovery and discovery may be unintentional—as is clearly revealed in illusions. Every individual adds daily to the diversified patterns of his life in the same way that he suddenly observes something different in illusory patterns.

There is but one scientific road to follow here. Naïve philosophical thinking which has masqueraded so long in scientific guise must be discarded. With it will necessarily go all attendant notions of unreality together with the common-sense confusion of the categories of psychology with those of physics. Perception cannot be scientifically expected to reveal "reality" during one moment and "unreality" during another moment. Perceptual reality is always of one order. Psychology can then drop all gross confusions due to linking reality with physics—or using "really" synonymously with "physically."

There can accordingly be no place in a *scientific psychology* for general treatment of illusions as advanced by various psychologists of whom we mention in particular Woodworth, Pillsbury and Dashiell. Woodworth (1) states that an "illusion is a false perception. Something is not really there . . . the stimulus