The effect of past experience on the distribution of visually induced motion

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Whether an object has been experienced as ordinarily mobile or stationary was found to have no bearing upon the allocation of visually perceived movement. Rather, the distribution of motion seemed to be influenced by the manner in which stimuli are expected to respond with regard to one another.

The purpose of this experiment was to determine how past experience affects the manner in which induced motion is assigned to two objects in the field. We employed stimuli which are ordinarily experienced as either stationary (e.g., a table) or functionally capable of moving (e.g., a sailboat). Such stimuli were paired under four conditions. In one condition, a normally mobile stimulus was used to induce motion in a stable one, while in another, a stable object induced movement in a mobile one. A greater degree of induced motion would obviously be expected in the latter case on the basis of past experience. As a control, both members of the pair were normally mobile in a third condition, and stable in a fourth.

Method

Stimuli. The stimuli consisted of luminously painted drawings of an army tank, a sailboat, a chair, and a table. The figures were laid out proportionately upon an 8 in. square backing. They were symmetrical, possessing no directional features.

Apparatus. The equipment has been fully described elsewhere (Broscole, 1967). It basically consisted of a frame, 60 in. high x 30 in. wide, upon which stimuli could be mounted. It was remotely driven back and forth along a set of tracks by a variable speed motor. It traveled 22 in. across space, 11 in. to the right and left of the objective median plane, at a rate of 20' of visual arc per sec. At the end of its 22 in. journey, the screen activated a relay reversing the motor, and, thereby, its direction of travel. The inducing stimuli were fastened to the screen.

The S controlled a target located directly in front of the screen at eye level. He was able to move it 30 in. to the right and left of the objective median plane by rotating a knob affixed to the shaft of a Selsyns synchronous motor. The position of the target and screen was automatically plotted on a Brush strip chart recorder.

Procedure. The experiment took place in total darkness with S positioned in a head and chin rest 10 ft. from the apparatus. It consisted of four conditions. In the first, S fixated the table figure (target) with

the boat located immediately above it in the objective median plane. He was instructed to adjust the target so that it appeared to be directly straight ahead, i.e., perpendicular to the midline of his body. He was then told that E could arbitrarily move both stimuli, either individually or in combination, in the same or opposite directions at any given time. The S's task was to adjust the target back to the subjective straight ahead whenever it appeared to move. Only the boat was set into motion, however. In half the cases it moved from true center to the right, back through center to the left, and back to center again for three such cycles or trials. In the remaining cases, its initial motion was to the left. The S's continuous adjustments indicated the extent to which the table was induced to move.

While the boat was induced to move by the table in the second condition, it was induced to move by the tank (a mobile stimulus) in the third. In the fourth condition, the chair was used to induce motion in the table. The four conditions were randomized differently for each S.

Subjects. Five males and five females participated in this study. Ranging in age from 17-21, their mean age was 18.5 years. They were undergraduates from C. W. Post College who were naive as to the purpose of this experiment.

Results and Discussion

The S's setting of the target was noted when the inducing stimulus was at its extreme left and right positions. The difference between these settings represented the range of motion induced in the target. A mean range was calculated for each S. Averaging across Ss, the target was induced to move 7.0, 7.4, 7.1, and 12.0 in. in Conditions 1-4, respectively. These differences were significant according to the Friedman two way analysis of variance ($X^2_3=12.8$, $df=3$, $p<.01$). The Wilcoxon test indicated, however, that while the fourth condition differed reliably from every other one (in each instance $T=0$, $p<.01$), the remainder were essentially the same.

It did not seem to matter, then, whether or not a given stimulus has been commonly associated with mobility in the past. The important parameter seems to be how the members of a given stimulus pair are usually experienced in relation to one another. Since tanks, tables, and boats make ludicrous couplings, the greatest amount of motion was carried by the inducing stimulus and the separate treatments

did not differ reliably. However, a chair and table tend to be grouped together. Displacing one relative to the other destroyed this unity. The S's adjustments represented an attempt to preserve their spatial proximity, as neither are functionally capable of moving. This instance, therefore, yielded the greatest amount of induced motion.

We may conclude that stimulus meaning does not

seem to affect the distribution of motion. The allocation of movement, however, appears to be contingent upon how objects are supposed to respond toward one another within a given situation. This matter, of course, must be explored somewhat further.

Reference

Broscole, L. Induced autokinesis. *Percept. & Psychophys.*, 1967, 2, 69-73.