The effect of rate of presentation on free looking time

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Two experiments investigated the effect of a pre-test series of pictures, presented at a fixed rate, upon Ss subsequent free looking time. The results indicated that high fixed rates of presentation (3 sec./presentation) reduced "natural" looking times, and low fixed rates of presentation (15 or 60 sec./presentation) increased natural looking times. The results were interpreted within an adaptation level theory framework. Accordingly, the fixed rate serves as an anchor which influences Ss "natural" looking time. Evidence was also found suggesting that a simple imitation interpretation is questionable.

A growing number of studies make use of the dependent variable of free looking time, i.e., the time S looks at a stimulus when he can look at it for as long as he likes (Berlyne, 1957, 1958a, 1958b; Berlyne & Lawrence, 1964; Cantor, Cantor, & Ditricks, 1963; Christiansen, 1961; Haywood, 1961, 1962; Haywood & Hunt, 1963; Leckart & Bakan, 1965; Zamansky, 1956, 1958). In such studies the design may call for demonstration, practice, or familiarization pre-test series where stimuli are presented at a fixed rate by E. For example, in studies of the effect of familiarity of pictures on looking time, familiarity is induced by showing certain pictures at a fixed rate of speed prior to testing (Cantor & Cantor, 1964a, 1964b; McReynolds, 1963). A problem arises concerning the possible relationship between the time spent looking at the pre-test stimuli (determined by E) and the time spent looking at test stimuli (determined by S). It is possible that free looking time during test periods may be significantly dependent upon presentation rates during the pre-test series. This study investigated the effect of different rates of pre-test stimulus presentation on the measure of free looking time.

EXPERIMENT I

Method

Subjects. The Ss were 27 males and 25 females selected from the introductory psychology course at Michigan State University.

Apparatus. The stimuli consisted of 92 miscellaneous photographs selected from national magazines. These were mounted on 3 in. x 5 in. unruled white cards and enclosed in clear plastic. The photographs were placed face down in a three-sided wooden box from which S could easily remove one picture at a time. A cardboard box was provided for discarding viewed pictures.

The time S spent viewing each picture was recorded semiautomatically with an Esterline-Angus event recorder. Each time S selected a photograph, E pressed

a button, producing a pen mark on the moving tape. Looking time was obtained by measuring the distance between pen marks. Neither E's control button nor the recorder could be seen or heard by S.

Procedure. There were three parts to the experiment. In Parts I and III the procedure was identical for all Ss. In Part I the S sat at a table and looked at 16 of the 92 photographs, one at a time. S was instructed to look at each photograph for as long as he liked. He was told he would not be asked to remember any of the pictures or anything about them. Each S viewed a different series of 16 pictures.

In Part II the Ss were divided into three groups. Group A (N=17) looked at 60 photographs for 3 sec. each. Group B (N=17) viewed 3 photographs for 60 sec. each. Group C (N=18) remained seated at the experimental table for 180 sec. but did not view any pictures. A 500 cps tone signaled S to look at the next stimulus. Thus, Group A experienced a "high" presentation rate (3 sec./presentation), and Group B experienced a "low" presentation rate (60 sec./presentation). Group C was the control.

Part III was identical to Part I except that none of the 16 pictures was previously seen. Thus, two measures of free looking time were taken on different sets of 16 photographs each; one before and one after the controlled rate of presentation. The stimuli were randomly ordered at the beginning of the experiment and a different consecutive set of 32 was selected for each S.

Initially S was informed that he would be given further instructions when he was finished looking at the pictures. In this second task Ss were asked to rate the stimuli on a 3-point complexity scale. No use was made of these ratings; their purpose was to give S closure on the experimental task.

Results

For each S the total time spent looking at the pictures in Parts I and III was computed. The mean looking time per picture for the three groups is presented in Fig. 1. The Rate by Trial Block interaction is significant, $F=22.86$, $df=2/46$, $p<.01$. Looking time increased in the group receiving the low presentation rate (60 sec./presentation), and decreased in the group receiving the high presentation rate (3 sec./presentation); $t=4.61$ and 3.49 , $df=16$, respectively, $p's<.01$. No significant change was found in the control group.

The difference between groups is also significant $F=8.34$, $df=2/46$, $p<.01$. This is partly due to the experimental treatment. The initial difference in looking

times between the three groups is not significant, $F=3.03$, $df=2/49$.

A further result is the significant Rate by Sex interaction, $F=4.97$, $df=2/46$, $p<.05$. In the low rate group the females looked longer than the males (10.7 vs. 6.9 sec./stimulus), whereas in the high rate and control groups males looked longer than females (6.1 vs. 5.3, and 6.2 vs. 4.5 sec./stimulus, respectively). Similar differences were present before the administration of the experimental treatment, suggesting the possibility that the interaction was due to sampling rather than the experimental treatment.

EXPERIMENT 2

In Experiment 1 the total time for fixed rate presentation (Part II) was held constant at 3 min. and the time spent looking at each stimulus presentation was varied. However, the total number of pictures viewed (3 or 60) was not controlled. Experiment 2 investigated the possibility of differential effects of rate and number of pictures. In addition to keeping total looking time constant, while varying the rate of presentation, the number of pictures viewed was held constant.

Subjects. The Ss were 26 males and 22 females selected from psychology classes at Michigan State University.

Apparatus. The stimuli were 45 color slides of landscapes, single objects, and arrays of objects photographed by E. Based on previously reported data (Leckart & Bakan, 1965) the stimuli were divided into three sets of 15 each so that approximately equal free looking times for each set were expected.

The stimuli were projected on a white wall by a Kodak Carousel 800 projector placed 13 ft. from the wall. S sat in a chair placed 12 ft. from and facing the wall. Controlled presentation rate was provided by two Hunter timers connected to the projector's changing mechanism. During the free looking period S was provided with a hand button which changed the stimulus. Looking times were recorded with a stopwatch kept out of S's view.

Procedure. In Part I all Ss looked at the first set of 15 pictures. The instructions were the same as in Experiment 1, except for modification required by changing the apparatus from manual to automatic stimulus presentation.

In Part II, the Ss were divided into three groups of 16 each. Groups I and II viewed the second set of stimuli at a controlled rate. The total looking time for each picture was 15 sec. Group I saw each stimulus on 5 different occasions for 3 sec. each. Group II saw each

Fig. 1.

stimulus on a single occasion for 15 sec. Thus, looking time for each picture was controlled, but the rate of presentation was varied (either 3 or 15 sec. per presentation). The control group remained seated for 7-1/2 min. without viewing any pictures.

In Part III all Ss viewed the third set of stimuli. The procedure was identical to Part I. Immediately after Part III, the rating task utilized in Experiment 1 was administered.

For each S the stimuli in each set were presented in a different random order.

Results

The mean looking times before (Part I) and after (Part III) the controlled presentation are presented in Table 1. The Rate by Trial Block interaction is significant, $F=12.11$, $df=2/42$, $p<.01$. Looking time increased in the group receiving the low presentation rate (15 sec./presentation) and decreased in the group receiving the high presentation rate (3 sec./presentation). Individual tests reveal these changes to be significant: $t=3.36$, $df=15$, $p<.01$, and $t=2.39$, $df=15$, $p<.05$, respectively. No significant change was found in the control group.

The main effect of rate and the Rate by Sex interaction were not significant, supporting the notion that the significance of these differences in Experiment 1 were due to sampling.

Discussion

The effect of rate of presentation can be interpreted in a number of ways. The S might interpret the pre-test rate of presentation as an example of what he should do in the free looking situation. There is evidence that looking time is subject to experimenter or social influences (Martin, 1964, and Walters, Bowen, & Parke, 1964). However, the extent of changes is not what one would expect from such a simple imitation hypothesis. In Experiment 1, the 30 sec. pre-test model results in looking times of less than 10 sec., and the 3 sec. model results in looking times of about 5 sec., with the pre-post

Table 1. Mean Looking Time Per Picture Before (Part I) and After (Part III) E Controlled Rate of Presentation

Controlled Rate of Presentation	Before (Part I)	After (Part III)
High (3 sec./presentation)	7.1	6.1
Low (15 sec./presentation)	7.2	10.3
Control	4.9	7.6

changes in either case being less than 2 sec. Experiment 2 yields analogous results; looking times of 10 and 6 sec. with pre-test models of 15 and 3 sec., and pre-post changes of 3 and 1 sec. respectively.

It appears likely that rather than serving as a model for imitation, the rate of presentation in the fixed rate condition serves as an anchor which influences the "natural" looking time of Ss either way. This "natural" looking time is conceived of as analogous to an adaptation-level which it is known can be moved up or down by introduction of an extreme anchor stimulus (Helson, 1947).

The data of this experiment may be relevant to McReynolds' (1956) theory of perceptualization rate. Perceptualization rate is defined as the rate at which new percepts are obtained and assimilated into perceptual systems. McReynolds hypothesized that "in general perceptualization tends to remain at, or return to a medial rate, except that after a period in which it has been markedly low it will tend to be high, and after a period in which it has been markedly high it will tend to be low." If it is assumed that the fixed presentation rates are in fact serving to increase or decrease perceptualization rate, McReynolds' theory would predict an increase in looking time following the high rate of presentation, and a decrease in looking time following the low rate of presentation. The results of this study are in a direction opposite to this prediction.

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