Factors affecting children's alternation and choice behaviors¹

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Following 0, 3, 6, 12, or 24 exposures to a red or a green light, 6-, 7-, and 8-year-old children were required on each of 31 trials to choose either the familiarized or a nonfamiliarized light by pushing a button which activated the chosen light. Response duration (RD) on each trial was either 1 or 11 sec for all Ss. Frequency of choice of the nonfamiliarized stimulus was increased by familiarization but did not vary as a function of amount of familiarization. Both alternation and latency varied with age and RD, but not with amount of familiarization.

This study was an investigation of children's alternation and choice behaviors as functions of amount of familiarization, age, and response duration (RD). Glanzer's (1953) stimulus satiation model suggests that, in a two choice situation, increasing amounts of familiarization to one stimulus ought to decrease the frequency of response alternation and increase the frequency of choice of the nonfamiliarized stimulus (NS). Age was included to determine if previous results (e.g., Weir, 1964) could be replicated. Studies (Iwahara & Sugimura, 1959, Experiment 2, Experiment 3) in which stimulus duration (STD) and RD appear to be confounded have resulted in a significant STD effect. However, when these variables have not been confounded (e.g., Croll, 1966), a significant STD effect has not been obtained. Another purpose of this study was to investigate the effects of RD independent of those of STD.

METHOD

Subjects

The Ss were 120 children attending kindergarten, first, and second grades at Austin School, Vermillion, South Dakota.²

Apparatus

The apparatus consisted of a stimulus panel and a response panel. The stimulus panel, visible through a viewing aperture, contained three light apertures arranged horizontally. The middle aperture was used only for familiarization and could be illuminated by a red, a green, or a white light. The two outside apertures, used only during choice trials, could be illuminated either by a red or a green light. The response panel consisted of two response buttons, one in front of and below each of the two outside apertures. A hand pad was equidistant (6 in.) from these two buttons.

Design

Twenty-four Ss were assigned to each of five amount of familiarization groups. In addition to 0, 3, 6, 12, or 24 presentations of the familiarization light, Ss in Groups 0, 3, 6, 12, and 24 were given 24, 21, 18, 12, or 0 presentations, respectively, of a white light prior to presentations of the familiarization stimulus (FS). Thus each S was administered a total of 24 stimulus presentations during the familiarization phase. Within each of these major groups, Ss were subdivided into three age groups: 6-, 7-, and 8-year-olds. Within each of the 15 amount of familiarization-age subgroups, half of the Ss were assigned to subgroups presented the red light as the FS, while the remaining Ss were familiarized on the green light. For half of the Ss in each of the resulting 30 subgroups, the red light appeared in the right aperture during choice trials and the green light appeared in the left aperture. For the remaining Ss in these subgroups, the spatial positions of the red and

green lights were reversed. The 31 choice trials included 16 trials on which S was required to depress the chosen button for 1 sec and 15 trials on which he was required to depress the chosen button for 11 sec. The sequence of long and short RDs was randomly determined for each S, with the restriction that the last response was always 1 sec in duration. STD and intertrial interval were always 14 and 2 sec, respectively, during both familiarization and choice trials.

Procedure

Each S was brought individually to a dimly illuminated room and seated in front of the apparatus. For the familiarization phase, S was instructed to lean his head against the viewing aperture and watch the lights.

Following the familiarization phase, S was instructed to keep his preferred hand on the hand pad except when responding. The S was told which button turned on the red light and which turned on the green light. He was then instructed that when he heard a buzzer he was to choose a light, push the button activating that light, and hold the button down until a bell rang.

RESULTS

First trial choice data was analyzed only for groups which had been familiarized on one of the two stimuli (Groups 3, 6, 12, and 24). χ^2 analyses indicated that on the first trial significantly more Ss chose the NS than the FS ($\chi^2 = 13.50$; $df = 1$; $p < .005$), but that the number of choices did not vary significantly with amount of familiarization ($\chi^2 = 3.63$; $df = 3$; $p > .5$).

A three factor analysis of variance on choice of the NS over trials indicated no significant main effects for age, trial blocks, or amount of familiarization, and no interactions.

The total number of alternations for each S following responses of each duration was analyzed using a three factor analysis of variance. Significant main effects were age ($F = 3.61$; $df = 2,105$; $p < .05$) and RD ($F = 4.83$; $df = 1,105$; $p < .05$). The main effect for amount of familiarization and all interactions were nonsignificant. The 6-, 7-, and 8-year-old Ss alternated on 77%, 90%, and 80% of the trials, respectively. An analysis using Scheffé's method of post hoc comparisons indicated that the 7-year-olds alternated significantly more than did the 6- or 8-year-olds, and the 8-year-olds alternated more than did the 6-year-olds. Alternation occurred more frequently following responses of long duration (84%) than following responses of short duration (81%).

Latency was measured from the onset of the buzzer to the onset of the chosen light. The analysis of the mean response latency of each S on trials following responses of each duration was identical to that used for the alternation data. The only significant effects in this analysis were age ($F = 3.90$; $df = 2,105$; $p < .05$) and RD ($F = 6.23$; $df = 1,105$; $p < .05$). Response latency decreased with age and increased with increases in RD.

DISCUSSION

Glanzer's (1953) stimulus satiation model suggests that, in a two choice situation, increasing amounts of familiarization to one stimulus ought to decrease the frequency of response alternation and increase the frequency of choice of the NS. Although familiarization as such increased choices of the NS on the first choice trial in the present study, amount of familiarization was not effective variable in influencing choice of the NS over all trials and did not affect latency of response or frequency of alternation. These findings were somewhat surprising in view of the fact that amount of familiarization

has been shown to be a variable which affects choices of a nonfamiliarized toy over trials (Endsley & Kessel, 1968), response speed (Miller, 1966), and observing time (Cantor & Cantor, 1966). The ineffectiveness of amount of familiarization in this study may have been due to the strong alternation tendencies of these Ss. The average amount of alternation over all trials was 82%. It should be noted that the latency measure used here differed substantially from that used in most previous studies.

The present study confirms the findings of previous studies that alternation is an age related response pattern (e.g., Weir, 1964).

The significant effect of RD on alternation and latency in the present study suggests that response characteristics may be important in determining children's alternation tendencies. It is possible that Ss experienced the longer RD as an aversive state of affairs or that the longer RD resulted in an accumulation of a greater amount of some inhibitory factor.

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NOTES

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