Children's probability learning as a function of the cross-sex effect[1]

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To assess the effects of the sex of E and S on the performance of S in a complex task employing social reinforcement, 6-yr.-old boys and girls were presented a probability learning task in which the sex of the reinforcing agent was varied. The general results indicated that when E was a male, girls made more correct responses than boys, while boys made more correct responses than girls, when E was a female.

In a recent review of the literature on social reinforcement with children, Stevenson (1965) has pointed out that one of the most consistent findings in this research has been the effects of the interaction between sex of E and S on S's performance. In general, the results concerning this interaction have shown that male Es are more effective sources of social reinforcement for female Ss than for male Ss, while female Es are more effective for male Ss than for female Ss.

Although a number of studies have demonstrated the cross-sex effect with children ranging in age from 3 to 8 yr. (e.g., Gewirtz & Baer, 1958; Stevenson, 1961; Stevenson & Knight, 1962), only simple operant tasks, having no solution or goal, have been employed. The purpose of the present study was to investigate the generality of the cross-sex effect in more complex tasks. Since probability learning tasks have been viewed as problem-solving tasks, which become increasingly difficult with increasing age (Weir, 1964), the present study employed such a task with the E as an active participant, taking turns with S in a hide-and-seek game.

Method

The Ss were 32 boys and 32 girls selected from children attending first grade classes in a Nashville elementary school. The Ss were from middle-class homes, and their mean CA was 6 yr. 4 mos. A male and female graduate student served as Es, and an equal number of boys and girls was assigned randomly to each E.

The apparatus was a light blue, rectangular game table, which has been described in detail elsewhere (Stevenson & Odom, 1964). A window shade ran lengthwise over the midline of the table and was lowered at the end of each trial to conceal the activity of E and S. Three boxes were mounted on both long sides of the table top. The rear of each box was open and flush with the table's edge. The top of each box was hinged and could be opened to reveal the inside of the box. The E and S each began the game with 10 plastic trinkets. The E had access to additional trinkets in the event that his supply was depleted.

The E escorted S to the experimental room and introduced him to a second adult (R), who recorded the responses of S and prompted S in the procedure of the game. (The R was always the same sex as E.) After taking a chair across the table from S, E said that they would take turns hiding and seeking trinkets and that at the end of the game the person with the most trinkets would be the winner. The E then began the game by pulling the shade down, hiding a trinket, raising the shade, and telling S to open the lid of the box he thought the trinket was in. Following S's choice, E said that it was S's turn to hide a trinket. If S found one of E's trinkets, E said, "Good, you won," and when E found one of S's trinkets, E said, "You lost." Reinforcing statements were not offered by E when trinkets were not found. This procedure was continued until each participant had 48 hiding and 48 seeking trials. When the task was completed, S was allowed to keep the trinket of his choice.

The E hid trinkets in only one of his three boxes and S was randomly reinforced for 66% of his responses to that box. The S was never reinforced for choosing either of the other boxes. The to-be-reinforced box was varied at random for different Ss with each of the three boxes being correct for an approximately equal number of Ss. The reinforcement schedule was constructed so that the sequence of reinforcement would not be the same for all Ss and so that no more than four consecutive correct responses would be reinforced. The E's seeking responses were determined by a prearranged random schedule, with the restriction that each of S's boxes be chosen with equal frequency.

Results

A 2 (Sex of E) by 2 (Sex of S) by 8 (Blocks of Trials) analysis of variance was performed on the number of correct responses, i.e., all responses made to the reinforced box. The only significant main effect was Trials ($F = 15.88$, $df = 7/420$, $p < .001$), reflecting an increase in the number of correct responses from the first to the last block of six trials for the combined sex of E-sex of S groups.

The significant Sex of E by Sex of S interaction ($F = 5.70$, $df = 1/60$, $p < .02$) was due to the fact that boys made more correct responses ($M = 27.50$) than girls ($M = 20.75$) when E was a female, and girls made more correct responses ($M = 24.82$) than boys ($M = 21.38$) when E was a male. The Sex of E by Sex of S by Trials interaction ($F = 2.08$, $df = 7/420$, $p < .044$) indicated that the increase in number of correct responses from the first to the last block of trials differed for the groups.

When E was a female, the mean increase in correct responses from the first to the last block of trials was 1.50 for boys and .75 for girls, but when E was a male, the mean increase was 2.12 for girls and 1.00 for boys. None of the other interactions was significant.

Discussion

The results of the present study demonstrate that young children's performance in certain kinds of complex learning tasks can be affected by sex of E and sex of S variables. Since the E's primary role in most studies of probability learning in children is that of providing instructions, the E as an active participant and/or a source of social reinforcement may be essential in determining the cross-sex effect in this kind of task. Nevertheless, these findings emphasize the potential importance of controlling for such variables in research that involves complex as well as simple learning. Control of such variables is not only important regarding research with children but also research with adults, since a recent study using adults as Ss has demonstrated the cross-sex effect (Stevenson & Allen, 1964).

Aside from methodological considerations, the cross-sex effect is of theoretical interest, and explanations for the phenomenon have been derived from Freudian Oedipal theory by Gewirtz & Baer (1958) and from social learning theory by Stevenson (1961, 1965). Both interpretations focus on the reinforcing value that the adult has for the child. It seems likely that the cross-sex effect found in the present study was a result of S's being more strongly reinforced for choosing the correct box when E was of the opposite sex than when E was of the same sex. Further research is needed in order to assess the characteristics of such reinforcement.

References

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Note

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