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ABSTRACT

The Starkweather Target Game is designed to measure preschool children's willingness to try difficult tasks independent of ability. The game consists of a box-shaped target which responds, when the target is hit by a rolled ball, somewhat like a jack-in-a-box. When the bull's eye is hit, the lid opens and a surprise picture appears. After being seen by the child, another picture replaces it. The game is appropriate for children between three and six years; older children have an understanding of competition and success in hitting the target is their only goal. Materials include the target; 21 surprise pictures; a rubber ball; a cloth strip on which black lines at two foot intervals show the distance at which the target may be placed; and two small markers, one marked "easy" and one marked "hard" indicating the target distances between which the child chooses as he plays the game. During the game, the child shows his willingness to try difficult tasks, making a total of 20 choices between the easy and hard. The score is calculated from the number of balls the child uses and the number of times he chooses the difficult in relation to the number of successes he experiences. The game is adjusted for the ability of each child on the basis of a pretest. Statistical data is included in the report. (RC)

STARKWEATHER TARGET GAME

FOR PRESCHOOL CHILDREN*

developed by
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The Starkweather Target Game is designed to measure preschool children's willingness to try difficult tasks, and to measure this characteristic independent of ability. The game consists of a box-shaped target which responds somewhat like a jack-in-a-box. When a bull's eye at the front of the target is hit, the lid opens and a "surprise" picture appears. The picture can be removed; and when it has been seen by the child, it is replaced by another picture. Early exploratory work indicated that for preschool children, the target had to be one with a built-in surprise. Only when confronted with this type of target were the children motivated to play the game in a way which revealed their willingness to try difficult tasks.

The target game is appropriate for children ranging in age from approximately three to six years. It is not suitable for use with older children. Children in the first and second grades have an understanding of competition, and success in hitting the target is their goal. They do not need the motivation of the surprise pictures. Beyond this, the skill with which these older children play the game makes an adjustment for ability virtually impossible. Several second grade children, who were avid bowlers, were able to roll a curved ball and hit the target at 40 feet!

The Instrument

The Starkweather Target Game (Figures 1 and 2) consists of the following materials: the target; 21 surprise pictures; a 3-inch rubber ball; a cloth strip on which black lines at 2-foot intervals show the distances at which the target may be placed; and two small markers, one blue with the letter "E" painted on it and the other red with the letter "H" painted on it, which are used to indicate the target distances between which the child chooses as he plays the game.

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Five levels of difficulty (target distances) are offered to each child. These are indicated by the cloth strip which is placed along the target range so that the nearest target distance is one, two, or three feet from the child depending upon his ability. The place where the child sits on the floor while playing the game is indicated by a large square marked with masking tape. (Young children who could not understand that they were to remain behind a line when rolling the ball to the target, were able to understand that they must remain in the square while playing the game.)

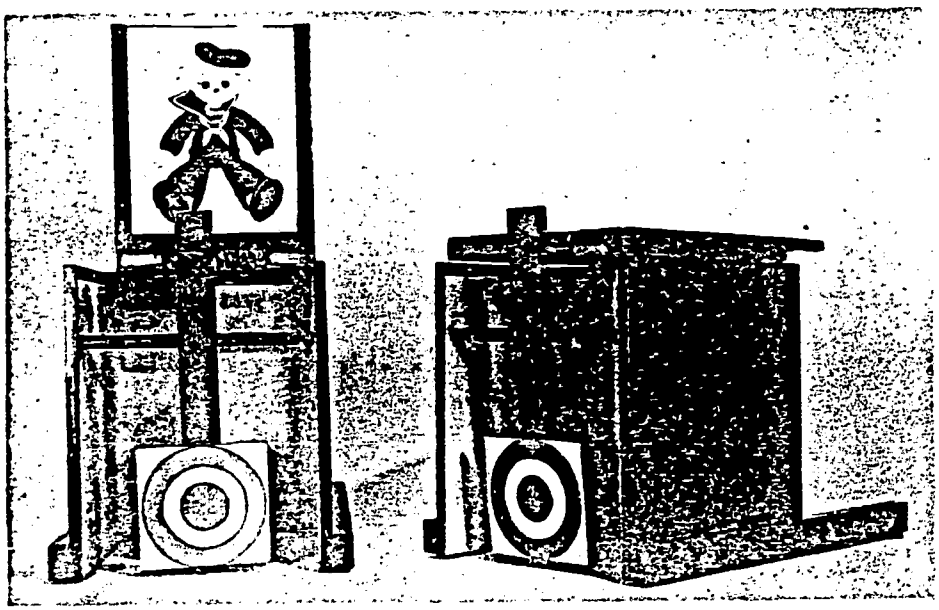

Figure 1. The target, open and closed.

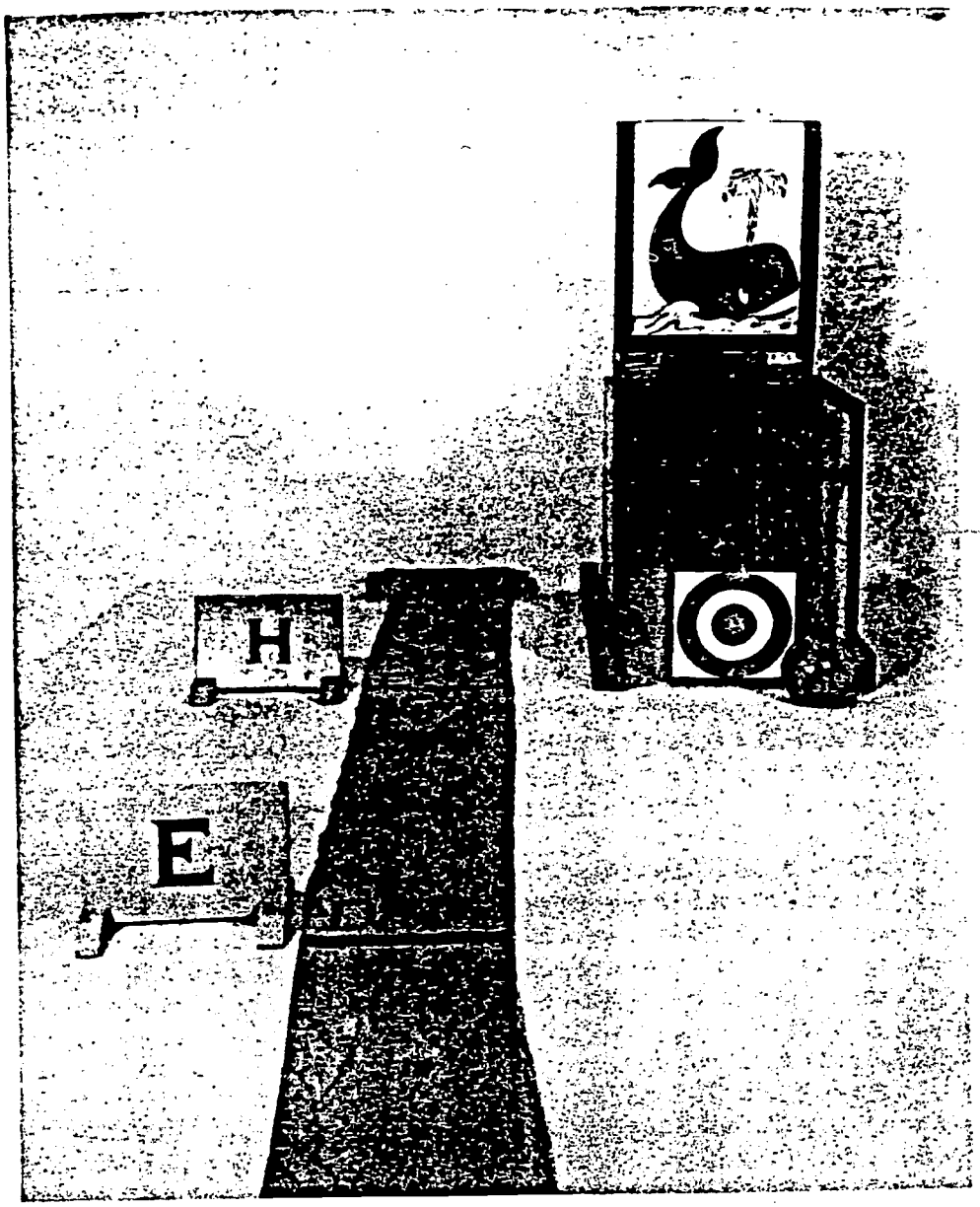

Figure 2. Materials used in the target game.

Pretest

The ability of each child is determined in a pretest, and the difficulty of the game is then adjusted so that the mid-point in the target range is a distance at which the child has approximately a 50 percent chance of success. In the pretest, the child rolls the ball twice to each of five target distances: 1-foot, 3-feet, 5-feet, 7-feet, and 9-feet. The number of successes obtained in the pretest determines the child's ability group and dictates the target distances which will be used for him in the actual game.

Ability Group	Successes in Pretest	Target Distances in feet
I : High	6 or more	3 - 5 - 7 - 9 - 11
II : Medium	4 or 5	2 - 4 - 6 - 8 - 10
III : Low	2 or 3	1 - 3 - 5 - 7 - 9

Administration

During the game, the child shows his willingness to try difficult tasks as he chooses between relatively easy and relatively difficult distances for the target. As the game begins, the child is seated in the square marked on the floor, and the cloth strip along the target range is moved, if necessary, so that the nearest target distance is the recommended distance for the child's ability group. The experimenter then places the two markers at target distances A and B, which are the two nearest the child. Then, holding the target off the floor, she asks the child to choose where the target should be placed. "This is the easy place (indicating the E-marker) and this is the hard place (indicating the H-marker). Where shall I put the box (target)--at the easy place or at the hard place?" (The easy and the hard are always presented in this order.) The target is then placed at the distance selected by the child and he is given two chances to hit it. The experimenter always accepts the child's choice of the easy or the hard and then comments in a simple and direct manner about his success or failure. "Good, you hit it," or "Oh, you missed. Try again." If the child misses on both attempts to hit the target, the experimenter indicates in her comment that the child will again choose between target distances. "Now you can choose again. This is the easy place and this is the hard place. Where shall I put the box -- at the easy place or at the hard place?"

During the game, the child makes a total of 20 choices between the easy and the hard. Each target distance is paired with every other target distance in the manner of a paired-comparisons test. The order of presentation is planned so that no one level of difficulty appears

in two successive pairs, and also is planned so that the child becomes familiar with the game by starting with the easier target distances. The order of presentation is shown on the score sheet. "A" represents the easiest level of difficulty or the nearest target distance, and "E" represents the hardest level of difficulty or the farthest target distance.

Each child's performance is recorded in terms of the target distances he chooses (A or B, C or D, etc), the number of balls he uses (1 or 2), and whether or not he succeeds in hitting the target (0 or 1). The performance of Child F-595 is illustrated on the score sheet. She first chose the nearest target distance (A), and she succeeded in hitting the target on her first try. She then chose the farther distance (B). She succeeded in hitting the target, but she used two balls in the process.

Scoring

The scoring of the target game takes into consideration the skill with which the child actually plays the game, and thus, provides an additional adjustment for ability. The score (B+D-S) is calculated from the number of balls the child uses (B) and the number of times he chooses the difficult (D) in relation to the number of successes (S) he experiences while playing the game.

Target game data and derived scores for several children are presented in Table I. The logic of the scoring method can be seen when these data are compared. For example, Child M-670 and Child F-598 chose the difficult target the same number of times (8) and succeeded in hitting the target the same number of times (15); but a difference in the ability of the two children is indicated by the number of balls used by each in obtaining these successes. Child M-670, whose score for the target game was 24, used more balls and demonstrated greater willingness to try the difficult than did Child F-598, whose score for the game was 20.

The final adjustment for ability, which is provided by the scoring of the target game, gives added strength to the game as an instrument which can be used to measure young children's willingness to try difficult tasks.

Evaluation of the Target Game

The target game is adjusted for the ability of each child on the basis of a pretest. This adjustment has been re-evaluated in terms of the skill demonstrated during the game by a group of 52 children. An ability score, the distance in feet at which each child actually had a 50 percent chance of success, was calculated; and a comparison of these scores, using the Kruskal-Wallis one-way analysis of variance, indicated

TABLE I

TARGET GAME DATA AND DERIVED SCORES

Child	Number of Balls	Number of Difficult	Number of Successes	Score B+D-S
M-670	31	08	15	24
F-598	27	08	15	20
M-708	27	13	16	24
F-679	27	04	16	15
F-595	30	06	13	23
F-064	30	06	17	19

that the abilities of the children in the three groups were significantly different. Median ability scores were 5.96' for Group I, 4.40' for Group II, and 3.76' for Group III. ($H = 11.675$; $p < .01$). When the children's abilities were expressed in terms of the target range, rather than in feet, the scores for the three groups were approximately the same, indicating that a reliable adjustment for ability had been made. The median adjusted ability score for each of the three groups placed the point of 50 percent success between the second and third target distances. The median adjusted ability scores were 2.48 for Group I, 2.20 for Group II, and 2.38 for Group III. ($H = 0.983$; n.s.).

The target game was developed as an instrument which could be used to measure preschool children's willingness to try difficult tasks, and to measure this characteristic independent of ability. Statistical evidence that the target game met this criterion was obtained by correlating the children's target game scores (B+D-S) with their ability scores (the distance in feet at which they had a 50 percent chance of success). A Spearman rank order correlation coefficient of +0.115 (n.s.) indicated that the target game successfully measured the children's willingness to try difficult tasks independent of their ability.

The internal consistency of the target game was demonstrated by means of a split-half correlation (Spearman-Brown formula). A coefficient of +0.876 ($p < .01$) indicated that the instrument was reliable.

Further analysis indicated sex and age differences in the expected direction. Boys were more skillful than girls, (Mann-Whitney $U = 245$; $p < .05$); and older children were more skillful than younger children, (Kruskal-Wallis analysis of variance, $H = 9.315$; $p < .01$).

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STARKWEATHER TARGET GAME

FOR PRESCHOOL CHILDREN

Name Child F-595 Sex F Number 595

Date 4-3-65 Birthdate 2-23-61 Age 4:1

Testing Place Stillwater

SCORE: B+D-S
23

	# Balls	Success		# Balls	Success
1. (A) - B	1	1	6. (A) - C	1	1
A - (B)	2	1	(A) - C	1	1
2. (C) - D	2	0	7. B - (E)	2	1
(C) - D	1	1	(B) - E	2	0
3. A - (E)	2	0	8. (A) - D	1	1
(A) - E	1	1	(A) - D	1	1
4. B - (C)	2	1	9. (C) - E	1	1
(B) - C	1	1	C - (E)	2	0
5. D - (E)	2	0	10. (B) - D	2	0
(D) - E	2	0	(B) - D	1	1

Pretest: 4

Group: II

Balls: 30

Difficult: 6

Successes: 13