The Effects of Vicarious Reinforcement on
Type A and Type B Children in a Competitive Situation

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(ABSTRACT)

Observing another child receive reinforcement has been shown by past researchers to produce two different types of effects: 1) facilitative, or 2) debilitative when children coact in a more competitive situation. Since Type A children have been found to engage in more comparison processes and are more competitive, the purpose of the present study was to empirically determine if Type A and Type B children's responses would differ in situations where they coacted with an intermediate status child who received or did not receive reinforcement. Fourth grade children were designated as Type A, Type B, or intermediate status by their teachers via the Matthews Youth Test for Health. Performance, affective behaviors, and written and verbal self-reports about the experimental situation were the dependent measures. Generally, it was found that reinforcement had non-specific facilitative effects on the performance of a dyad, and a mild facilitative effect for vicarious reinforcement was observed. Observing reinforcement was found to negatively effect children's enjoyment of the task, however. Type A children did not respond differentially than Type B children to observing versus not observing another child receive reinforcement, although Type A children's performances were more variable than Type B children's regardless of the situation. These results are discussed in terms of their implications for understanding vicarious reinforcement processes, and Type A behavior in children.

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Introduction

Vicarious reinforcement principles are used to explain change in behavior that is demonstrated by individuals who observe others receive reinforcement for that same behavior. Under the principles of vicarious reinforcement, similar change in behavior is predicted to occur for the individual directly reinforced and those individuals observing the delivery of reinforcement (Bandura, 1971, Bandura, Ross, & Ross, 1963). This effect would seem to be particularly useful for those interested in changing the behavior of several individuals at the same time, especially when it is difficult to deliver reinforcement to these persons individually. Such situations naturally occur both in the classroom and in the family unit. According to the principles of vicarious reinforcement, a teacher or parent delivering contingent reinforcement to one child may expect to effect similar behavior change in other children observing the contingency.

The effects of vicarious reinforcement have been demonstrated by numerous researchers (e.g., Bandura, Ross, & Ross, 1963, Braun, 1972, Marston, 1966). The typical paradigm involves arranging an environment where all individuals will have equal opportunity to produce a particular response. One individual then serves as a model and is reinforced for emitting the response, while another individual merely observes this contingency. The observer is then given the opportunity to perform the response. This paradigm evolved from an early investigation by Miller and Dollard (1941) that demonstrated the effects of reinforcing models on observers' behaviors, and was later termed vicarious reinforcement by Lewis and Duncan (1958).

More recently, Kazdin (1979) reviewed the importance of clearly specifying the behaviors, consequences and contingencies for producing the vicarious reinforcement effect in applied settings. He suggested that a vicarious reinforcement effect is more likely to be found: when several models are reinforced, when discrimination of appropriate responding by observing children is possible, in situations where rewarded imitative behavior may be observed, and when models possess charactersitics of high status, prestige, and competence. Kazdin's (1979) review also indicated that vicarious reinforcement may produce responding by the observing child at a level higher than, equal to, or slightly lower than the level of the directly reinforced peer. Furthermore, without subsequent intermittent direct reinforcement, the vicarious reinforcement effect may not persist (Weisberg & Clements, 1977).

Other researchers have found that the vicarious reinforcement effect is not consistently produced, however. For example, Sechrest (1963) reported contradictory results in an experimental setting using children as subjects. He found that the puzzle-solving behavior of children observing others receive reinforcement changed in a direction opposite to the puzzle-solving behavior of individuals who were directly reinforced, either positively or negatively. Likewise, Christy (1975) failed to demonstrate vicarious reinforcement effects for attentive behavior in children, and while Kazdin (1973) demonstrated vicarious reinforcement effects for attentive behavior, he failed to do so for inattentive behavior. In addition, Sharpley (1982) did not find a vicarious reinforcement effect on a task involving reproduction of the letters of the alphabet when coactors were not allowed to talk with each other. Finally, several researchers (Christy, 1975, Aaron & Bostow, 1978) have found that not all children demonstrate the vicarious reinforcement response when observing another child receive direct reinforcement.

These studies suggest that vicarious reinforcement at times may produce an effect which is opposite of what is usually expected by theorists such as Bandura (1971). That is, observing another child being reinforced for a behavior may initially result in an increase in that behavior in the observer, but over time the net result may be a decrease in the behavior. The debilitating effects of observing another receive reinforcement have been shown for normal as well as severely disturbed children (Ollendick, Shapiro, & Barrett, 1982). They also have been demonstrated with a variety of reinforcers (such as teacher attention, verbal praise, and food), and with a variety of behaviors (such as attending to task, in-seat behavior, and puzzle-solving performance).

In order to further examine this unexpected effect, Ollendick and his colleagues (Ollendick, Dailey, & Shapiro, 1983, Ollendick & Shapiro, 1984, Ollendick, Shapiro, & Barrett, 1982) used a paradigm which consistently produced debilitating effects on the performance of individuals who observed another receive reinforcement. In this paradigm, two children were seated adjacently and both were given a simple task to perform. One child was randomly chosen to receive direct reinforcement for performing, while the second child observed the first child being reinforced and did not receive direct reinforcement during the experimental session. This paradigm is an altered version of the typical vicarious reinforcement paradigm in specifying that both children perform the desired response in the situation at the same time, rather than consecutively. Importantly, other studies that also demonstrated the negative effects of observing another receive reinforcement likewise used procedures in which the individuals had the opportunity to respond contemporaneously in the same situation.

In fact, Bandura (1971) distinguished between vicarious reinforcement, where observers do not have the opportunity to respond in the same situation contemporaneously with models, and "implicit reinforcement." He describes implicit reinforcement to occur in situations where both children have the opportunity to respond contemporaneously. One child is then explicitly reinforced, while the observing child is implicitly rewarded or punished. This "implicit reinforcement" situation is thus what actually occured in most studies which demonstrated a debilitating effect on performance of observing another child receive reinforcement.

The usual result of using such a paradigm was for the observing child initially to increase his/her performance as though being vicariously reinforced. After several trials, however, the performance of the observing child was seen to decrease, often to performance levels below that of control children who neither observed nor directly received reinforcement. It was also shown that intermittent delivery of reinforcement to the observing child in later trials resulted in an increase in performance (Ollendick et al., 1983). That is, reversal of the negative effects of observing another receive reinforcement was accomplished by intermittently reinforcing the observing child. Sex differences for the debilitating effect were absent in these results, although age differences were apparent (Ollendick & Shapiro, 1984). The performance of older children (third to sixth graders) who observed another receive reinforcement was more adversely affected than that of younger children (first to second graders). In addition, younger children who observed reinforcement displayed more affective responses as their performance decreased than did the older children. A sex by age interaction for affective responding was also present. Affective responding increased with age in girls, and decreased with age in boys. Finally, history of reinforcement was also shown to effect these results (Ollendick et al., 1983). When children participated in three sessions of this experimental situation over a two or three day period, the performance of the observing child initially increased then declined in the first session, rebounded up to the level of the directly reinforced child in the second session, then returned to significantly lower levels by the third session.

To summarize, observing another child receive reinforcement has been found to produce two different types of effects. A vicarious reinforcement effect is what was most typically found. That is, the observing child's behavior increased to levels similar to the level of the directly reinforced model and was maintained at that level by either continued observation of a reinforced model, or by intermittent direct reinforcement. Other researchers have found, however, that this facilitating reinforcement effect was not consistently produced. Rather, observing another child receive reinforcement for similar behavior in the same situation actually had a debilitating effect on the behavior of the observing child.

The effects of observing another child receive reinforcement have been been explained in two ways. Kazdin (1973, 1979) and Gewirtz (1971) both suggested that reinforcement of the target child served as a discriminative stimulus for the observing child. Such a stimulus was thought to provide a cue that similar performance might likewise be followed by reinforcement for the observing child. This explanation did not fully explain the debilitating effects of observing another receive reinforcement that were found by researchers such as Ollendick and his colleagues, however. To fully account for these findings, Ollendick and Shapiro (1984), as well as Sechrest (1963) took a different view and suggested that in effect the non-reinforced child was being "implicitly punished" for performing, thus resulting in the observed performance decrement over time. That is, although the non-reinforced child observed another receive reinforcement for performing, the direct consequence for this child was non-reinforcement for performance similar to that of the directly reinforced child. Thus, in not receiving an available reinforcer for behavior which was reinforced in another child, the observing child was being implicitly punished.

The evoking of an implicit punishment explanation for the negative effect on behavior of observing another receive reinforcement is related to adopting the view that the situation in these experiments is inherently competitive. That is, the model and observer may be viewed as competing for the limited resource of praise and attention from the experimenter. When only the model receives this reinforcer, the other child is then punished repeatedly for competing for this reinforcer by not receiving the reinforcer. When intermittent reinforcement does occur, the observing child then becomes intermittently reinforced for competing. Indeed, in describing the paradoxical effects of vicarious reinforcement, Sechrest (1963) concludes that these "effects would be more likely to be found in situations in which the observer and the model are engaged in some sort of competitive or quasi-competitive task" (p. 200). Likewise, Ollendick et al.'s (1983) findings of a renewed effort put forth by the observing child in the second session of the experimental situation fits nicely with the implicit punishment hypothesis, and with the view that the children are indeed competing with each other.

In line with Mischel's (1968) formulation of behavior being the result of a person-environment interaction, one might also expect that children who bring a competitive strategy into the situation would also behave as though this were a more highly competitive situation. This strategy may be adopted by children who have experienced such a situation in their immediate learning history, as in the Ollendick et al. (1983) study. Although experience with the competitive situation in the first session produced increased efforts to perform in the subsequent session, the net effect by the third session was further decrement in performance. This pattern resembles that seen within one session for children who observed another receive reinforcement: an initial burst in performance, followed by a performance decrease below the level of control children who neither received nor observed reinforcement.

A competitive strategy is also purported to be a relatively stable characteristic of Type A children (Matthews & Angulo, 1980). In adults, the Type A behavior pattern is a set of behaviors that were originally observed in cardiac patients (Friedman & Rosenman, 1974). This pattern has since been delineated as a predictor of coronary-proneness, particulary by Jenkins (1971, 1976), the Framingham Heart Study group (Haynes, Levine, Scotch, Feinleb, & Kannel, 1978), and Rosenman (1978). Although not considered a trait, the essential characteristics of Type A children and adults include competitive achievement striving, aggressiveness, easily aroused hostility, and a sense of time urgency (Matthews, 1982).

The Type A behavior pattern can be measured in both children (Matthews & Angulo, 1980) and adolescents (Siegel, 1982). In a measure of Type A behavior using teacher ratings of children designed by Matthews and Angulo (1980), two orthogonal factors were found: competitiveness and impatience-aggression. This measure, the Matthews Youth Test for Health (MYTH), was shown to be internally consistent and reliable (Matthews & Angulo, 1980). The MYTH has also been found to be relatively stable over a one-year period (Matthews & Avis, in press), and highly stable over a three-month period (Murray & Bruhn, 1983). Finally, Murray and Bruhn (1983) found that teachers' Type A scores as measured by the Jenkins' Activity Survey were unrelated to the teachers' MYTH ratings of their students. This finding suggests that teachers were able to reliably rate their students on the MYTH, regardless of their own Type A classification.

The Type A behavior pattern as measured by the MYTH has been related to several other behaviors in children. For example, Matthews and Volkin (1981) found that Type A children performing tasks with ambiguous performance criteria made greater efforts to excel, similar to the efforts to excel of Type A adults in such situations. In addition, both Type A children and adults in an uncontrollable situation initially made vigorous attempts to assert control over the situation (Matthews, 1979). Type A children were also found to compare their performance against a superior coactor regardless of the absence or presence of an explicit performance standard, while Type B children only compared to a superior coactor in the absence of an explicit performance standard (Matthews & Siegel, 1983). Thus, both Type A and Type B children engaged in comparison processes when explicit performance standards were present, but only Type A children did so when no performance standards were present. In addition, Type A children were seen to aggress against a Bobo doll earlier than Type B children, and they were seen to be more impatient as well (Matthews & Angulo, 1980). Finally, Type

A boys were found to respond to challenge with a greater increase in systolic blood pressure than Type B boys (Lundberg, 1983).

How Type A children would respond to observing a coactor being reinforced for performing the same behavior over a series of trials as in the Ollendick et al. (1983, 1984) studies is an empirical question. As described previously, this situation appears to be an inherently competitive one, and one would expect Type A children's competitive, achievement orientation to lead to at least initally high levels of performance. In line with the findings of Matthews and Volkin (1981), this initial effort to excel should be significantly higher for Type A than Type B children.

The situation is also uncontrollable, in that no matter how well individuals perform, reinforcement is always delivered to a pre-designated individual. Hence, the findings of Matthews (1979) suggest that Type A children will also persist in their efforts to assert control over the situation. This control may be evidenced by the Type A children displaying more prolonged initial high levels of performance than the Type B children. It may also be evidenced in displays of hostility and aggression by the Type A children, which were seen to be characteristic of them by Matthews (1980).

In addition, Type A children in later trials of the experimental situation would be expected to respond with greater strength to the implicitly punishing aspects of the situation. This response could include more aggressive (Matthews & Angulo, Carver & Glass, 1978) and comparison (Matthews & Siegel, 1983) behaviors directed towards the reinforced coactor, and may include more requests for attention and reinforcement from the experimenter as well. If present to a high degree, these behaviors could interfere with task performance, resulting in a greater decline in performance from earlier trials than would be seen in Type B children, who might exhibit less of these performance-interfering affective behaviors. Although Ollendick and Shapiro (1984) failed to find such a relationship between affective responding and performance, this relationship may have been masked by the effects of grade level and sex, as well as by having Type A and Type B children randomly scattered across observing and directly reinforced conditions.

Finally, although boys are generally thought to be more competitive than girls, these effects should not be expected to differ between the sexes, based on earlier findings (Ollendick & Shapiro, 1984).

In summary, it is hypothesized that Type A and Type B children should respond differently to a modified vicarious reinforcement situation. Type A children observing others receive reinforcement would be predicted to show greater intial performance bursts, greater subsequent performance declines, and more affective responding in later trials than

Type B children observing others receive reinforcement.

Further, it is predicted that Type A and Type B children who observe others receive reinforcement would show greater initial performance bursts, greater subsequent performance declines, and greater affective responding in later trials than control Type A and Type B children who neither observe nor directly receive reinforcement. Finally, directly reinforced children who are intermediate in their Type A-B status would be predicted to show consistently higher performance and lower affective responding across trials than intermediate status children who neither observe nor receive reinforcement.

Method

Subjects

One-hundred and ten children, attending fourth grade in a rural school in southwestern Virginia, served as subjects (56 girls and 54 boys). The Matthews Youth Test for Health (MYTH) was completed by teachers of these children in order to classify the children according to the Type A-B typology. Within each sex, the children who were scored by their teachers in the highest and lowest quartiles on the MYTH were classified as Type A and Type B children, respectively, while the middle two quartiles were considered as intermediate children. This resulted in twenty-seven Type A children, twenty-eight Type B children, and fifty-five intermediate children. Mean MYTH ratings for this sample of children are reported in Table 1, and are seen to be quite similar to MYTH ratings of Type A and Type B children who served as subjects in the previous studies of Matthews and her colleagues.

It is important to note that only the overall MYTH score, and not the competitiveness and impatience-aggression factor scores, were used to designate children as Type A, Type B, or intermediate status. In that the two orthogonal factors contribute to the MYTH rating, the overall MYTH scores do not fall on a uniform continuum, but are compsed of two separate continua.

Children were assigned randomly to same-sex dyads, with the constraint that one child in each dyad was either a Type A or Type B child, while the other child in the dyad was an intermediate child.

Within each sex, seven dyads consisting of a Type A child and an intermediate child were assigned randomly to the experimental condition, while the remaining seven dyads were assigned to the control condition. The same assignment procedure was followed for the dyads consisting of Type B and intermediate children. Because of the limited size of the school, however, only six dyads consisting of a Type A boy and an intermediate boy were available for this study. This resulted in twenty-seven same-sex dyads (13 male and 14 female) in the experimental condition, thirteen consisting of one Type A child, and fourteen consisting of one Type B child. In the control condition, there were twenty-eight same-sex dyads (14 male and 14 female), fourteen consisting of one Type A child, and fourteen consisting of one Type B child. In the experimental condition, the classified children were designated to observe direct social reinforcement of the coactor, while intermediate children were designated to receive direct social reinforcement for performance on the task. Neither intermediate nor classified children received reinforcement in the control condition.

Although estimates of intellectual ability were not obtained, only children who had successfully passed previous grade levels and who currently were receiving average grades ("C" or above) served as subjects.

Experimenters and Task

One undergraduate female and one graduate female served as experimenters; both were trained on experimental procedures prior to initiation of the study. In addition, a trained undergraduate female served as reliability judge for the scoring of dependent measures described more fully below.

The experimental task consisted of an extension of the Coding subtest of the Wechsler Intelligence Scale for Children. Ten pages of 120 digit-symbol substitutions were collated and arranged in an experimental packet. At the bottom of each page, "STOP HERE" was printed. The objective of the task was to complete as many digit-symbol substitutions as possible until instructed to stop by the experimenter. This task was used previously by Ollendick and his colleagues in similar investigations.

Procedure

Following experimental group assignment, children were alternately drawn from classrooms so that members from each class were seen at comparable times throughout the duration of the project. Children were escorted to an experimental room, an adjacent classroom, by the experimenter. Interactions were limited to discussions of school-related activities (e.g., in-class and extra-curricular activities).

In the experimental room, children were seated adjacent to one another along one side of a worktable. The experimenter positioned herself on the other side, assuming a teacher role. Each group of children were given the following instructions:

> Today, we are going to be doing some activities together. Look at the top page of the papers before you. Do you see the divided boxes or squares up here? Each box has a number in the top part and a mark in the bottom part. Each number has its own special mark. Now look down here where the boxes have a number in the top part but the squares on the bottom are empty. You are to put in the empty squares the marks that should go there. (The experimenter then modeled the correct response for three sample items.) Here is a 3, the 3 has this mark; here is a 7, the 7 has this mark; and here is a 1, the 1 has this mark. Now you fill in the rest of these boxes up to this line (10 sample items were provided).

When the sample items had been completed successfully, the experimenter resumed instructions:

> When I tell you to start, I want each of you to

> fill in the remaining boxes. Begin up here and fill in as many squares as you can, one after the other, without skipping any. Keep working until I tell you to stop. When you finish this line, go on to the next one. Work as quickly as you can without making mistakes. Do you have any questions? Ready, begin.

Children were given two minutes in which to complete each page of the digit-symbol substitutions. Previous studies (Ollendick et al., 1983, Ollendick & Shapiro, 1984) have revealed that children at this grade level are not able to complete the number of substitutions on each page (trial) in the allotted time.

In the control condition, following performance on each of the first eight pages (trials), children were told:

> O.K. Time is up for that one. Now we are going to work on the next page. Please turn the page. Are you ready? Begin.

In the reinforcement condition, the intermediate child in each group was chosen to receive direct social reinforcement on each of the first eight pages (trials) of digit-symbol substitutions. The child classified as either Type A or Type B received no direct social reinforcement throughout these eight trials but observed the intermediate child receive reinforcement. Following performance on each of these trials, the experimenter said:

> O.K. Time is up for that one.

Then, looking directly at the intermediate child, she smiled and said:

> That's really good (child's name). You did very well on that page. That was good work. You really worked hard. Congratulations.

Then, addressing both children in the group, she said:

> Now we are going to work on the next page. Please turn the page. Are you ready? Begin.

This procedure continued for the first eight trials of the digit-symbol substitution task. The experimenter noted affective responses for each trial during the subsequent trial. Following the eighth trial, three open-ended questions were asked first of the Type A or Type B child, and subsequently of the intermediate child. The children were alternately asked to wait outside the experimental room so that each child had the opportunity to respond without his/her partner present. Subsequently, the children were brought back into the experimental room and a self-report measure was administered to both children simultaneously.

For the final two trials, children in both conditions were lavishly praised and congratulated for their performance. This strategy was used in order to reverse the detrimental effects potentially accrued as a result of the experimental manipulations. After both children had left the room at the end of the experimental session, the experimenter recorded her observations of affective responses on an audiotape of the session.

Dependent Measures

Several dependent measures were examined. The first, digit-symbol performance, was obtained by crediting the child one point for each square filled in correctly on the digit-symbol substitution task. Scores could range from 0 to 120 on each trial.

The second measure consisted of several categories of verbal and non-verbal affective responses, adopted from Pepitone (1972). The categories included: 1) attention to the coactor, 2) attention to the experimenter, 3) positive self-evaluations, 4) negative self-evaluations, 5) positive other-evaluations, 6) negative other-evaluations, 7) comparisons indicating self better, 8) comparisons indicating other better, and 9) physical expressions of anxiety or tension. These were recorded verbally on an audiotape by the experimenter for the Type A and Type B children following the experimental session. The affective responses were then scored on an occurrence/non-occurrence basis for each trial from the audiotape. These discrete responses were summed to form continuous variables across the eight trials. This resulted in total affective response scores that could range from 0 to 8 for each of the nine categories of affective responses.

The reliability judge also scored affective responses from the audiotapes of the experimental sessions for 25% of the Type A and Type B children, although reliability estimates of experimenters' observations were not obtained. Reliability for scoring the experimenters' observations of affective responses from the audiotapes was determined by totalling the number of agreements between the scorer and the reliability judge for the total scores for the nine categories for each child, and dividing the number of agreements by the total number of agreements and disagreements. The reliability estimate for overall affective response scoring was .82; reliability estimates ranged from .62 to 1.00 for the nine individual affective response categories.

The categories were defined and scored as follows. Attentional acts consisted of the child visually looking at the other child and his/her booklet, or visually looking at the experimenter. Attentional acts were only scored when they occurred during a given trial itself. That is, they were only scored if they occurred prior to the beginning of, or following the end of each two-minute trial. Self-evaluations included positive and negative statements about one's own performance. Other-evaluations included positive and negative statements about the coactor's performance. Comparisons included statements indicating that either oneself or one's coactor was performing better (e.g., "I'm beating him," "She's doing better than me."). Finally, physical expressions of anxiety or tension included such acts as heavy sighing, neck-rubbing, knuckle-cracking, stretching, hand- or foot-tapping, and shaking one's writing hand. Self- and other-evaluations, comparisons, and physical expressions of anxiety or tension were scored for a given trial when they occurred between the time the trial began and the time the subsequent trial began. Any number of categories could be scored for a given trial.

Following the eighth trial, each child was individually asked three open-ended questions by the experimenter while the other child waited outside of the experimental room. The Type A or Type B child was always interviewed before the intermediate child. First, the child was asked, "What do you think about what we are doing so far?" Responses were scored on an occurrence/non-occurrence basis for whether the child made a direct comparison between his/her own performance and the performance of his/her coactor. Second, the child was asked, "How well do you think you are doing so far?" Third, the child was asked, "How well do you think your partner is doing?" Responses to these latter two questions were scored on a three-point scale of "Not good," "O.K./good," or "Very good." Additionally, responses to these two questions were scored for whether the child indicated the same performance levels for him/herself and his/her coactor (no implied comparison of performance), or different performance levels (implied comparison of performance). Finally, also scored in response to questions two and three was the occurrence/non-occurrence of a direct comparison of performance by the child (e.g., "He beat me," "She's doing O.K., too," or "She's doing better than me"). The reliability judge also scored children's responses to the open-ended questions for 25% of the dyads. Reliability for scoring each of the five measures derived from the open-ended questions was determined by counting the number of agreements between the scorer and the reliability judge for each measure, and dividing this by the number of agreements and disagreements. Reliability estimates for scoring whether an overt comparison was made in response to "How well do you think you're doing so far" was 1.00. Reliability estimates of 1.00 were also obtained for scoring the childrens' ratings of their own and of their coactors' performances. The reliability estimate for scoring implied comparisons of performance was 1.00, while the reliability estimate for scoring direct comparisons of performance was .88.

A self-report measure was also administered to both children together following the eighth trial. It consisted of a series of five-point Likert scales on which the children were asked to indicate: 1) How much they enjoyed the task, 2) How much they would like to do the task again, 3) How much they enjoyed working with the other child, 4) How much they would like the other child to be their friend,

5) How fairly they felt they were being treated, 6) How much they felt like they were competing, and 7) How much they liked the experimenter. Scores on each question could range from 1 to 5.

Results

Children classified as either Type A or Type B were divided into those who observed another receive direct social reinforcement (experimental condition) and those who did not observe another receive direct social reinforcement (control condition). Intermediate children were divided into those who received direct social reinforcement in the presence of a Type A or Type B coactor, and those who did not receive direct social reinforcement in the presence of a Type A or Type B coactor. Type A, Type B, and intermediate children varied across sex of subject.

Digit-symbol Performance

A sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) X trials (eight trials) repeated measures analysis of variance (ANOVA) was computed on the number of correct digit-symbol substitutions for Type A and Type B children. This ANOVA was performed in order to determine whether Type A and Type B children responded differentially to observing or not observing another child receive direct social reinforcement.

A summary table of this analysis may be found in Table 2. The main effect of sex was significant ($p=.01$), indicating that Type A and Type B girls performed better than Type A and Type B boys overall (girls $\underline{M}=65.2$, boys

M=57.5). Additionally, the trials X classification interaction was marginally significant ($p=.06$). The means for the Type A and Type B children for the eight trials are presented graphically in Figure 1. Subsequent analyses indicated several interesting findings and are summarized in Table 3. Both Type A and Type B children performed significantly better on trial eight than they did on trial one ($p=.0001$, and $p=.0001$, respectively). In addition, Type A children evidenced a significant increase in performance between trials one and two ($p=.0001$), and a significant decrease in performance between trials six and seven ($p=.02$). Type B children also evidenced a significant increase in performance between trials one and two ($p=.0001$), as well as a significant increase between trials three and four ($p=.05$). Finally, on no trials did the Type A children perform significantly better than the Type B children ($p>.05$), although Type A children performed marginally better on trials two and six than Type B children ($p=.10$ and $p=.11$, respectively).

The main effects of condition ($p=.10$), and of classification ($p=.26$) were not significant, nor was the condition X classification interaction ($p=.63$). These results indicate that children observing another receive reinforcement performed no better than children who did not observe another receive reinforcement, and that Type A and Type B children did not perform significantly differently overall. Furthermore, Type A and Type B children did not respond differentially to observing and not observing another receive social reinforcement on their digit-symbol performances. Finally, the interactions of trials X sex and trials X condition were not significant ($p>.05$).

A repeated measures ANOVA collapsed across sex was computed as differential digit-symbol performance of boys and girls was not found to occur across conditions, classifications, or trials. This ANOVA was undertaken to increase the power of the analysis. This resulted in a 2 X 2 X 8 (condition X classification X trials) repeated measures ANOVA. The interaction of trials X classification was significant ($p=.05$). The subsequent analyses for this interaction were discussed previously. The main effects of condition, and of classification, and the condition X classification interaction were again found to be not significant ($p>.05$). Also, the trials X condition interaction, and the trials X condition X classification interaction were not significant ($p>.05$). Thus, these findings would appear to be relatively robust for this sample of children.

A sex of subject (male, female) X condition (experimental, control) X classification (intermediate working with Type A, intermediate working with Type B) X trials (eight trials) repeated measures ANOVA was then computed on the number of correct digit-symbol substitutions completed by intermediate children. The results of this analysis are summarized in Table 4. This ANOVA was performed in order to compare the performance of intermediate children either receiving or not receiving direct social reinforcement in the presence of Type A or Type B children.

The trials main effect was significant ($p>.05$), however no other main effects nor interactions were significant. These include the main effects of sex ($p=.18$), condition ($p=.26$), and classification ($p=.92$), and the interactions of sex X condition ($p=.75$), sex X classification ($p=.75$), and condition X classification ($p=.71$). The non-significant condition main effect indicates that intermediate children receiving direct social reinforcement did not achieve higher digit-symbol performance scores than intermediate children not receiving direct social reinforcement. The non-significant classification main effect indicates that intermediate children did not perform differently when working in the presence of Type A or Type B children. Additionally, all interactions with trials were not significant, including trials X sex ($p=.69$), trials X condition, ($p=.28$), and trials X classification ($p=.47$).

Type A, Type B, and intermediate children were then combined in a sex (male, female) X condition (experimental, control) X classification (Type A and intermediate working with Type A, Type B and intermediate working with Type B) X trials (eight trials) repeated measures ANOVA. This ANOVA was performed in order to test whether children working in the presence of social reinforcement (experimental condition) performed differently on the digit-symbol substitution task than children working in the absence of social reinforcement (control condition). It also tests whether children working in dyads composed of one Type A child perform differently than children working in dyads composed of one Type B child. Note that the experimental condition does not differentiate between children who directly receive social reinforcement and children who observe another receive social reinforcement. Furthermore, both the experimental and control conditions are composed of Type A, Type B, and intermediate children.

The results of this analysis are summarized in Table 5. A significant main effect was found for sex ($p=.005$), indicating that over all conditions girls achieved higher digit-symbol performance scores than boys (girls $\underline{M}=65.4$, boys $\underline{M}=59.6$). The condition main effect itself was also significant ($p=.05$). This indicates that children working in the presence of social reinforcement (experimental condition) achieved higher digit-symbol substitution scores than children in the control condition who worked in the absence of social reinforcement (experimental $\underline{M}=64.7$, control $\underline{M}=60.6$). The main effect of classification, and the condition X classification interaction were not significant, however ($p>.05$). No interactions with trials approached significance, including trials X sex ($p=.16$), trials X condition ($p=.45$), and trials X classification ($p=.36$).

In order to compare this study's results with those of

Ollendick and Shapiro (1984), a sex (male, female) X condition (direct: receive direct social reinforcement, observe: observe social reinforcement, control: neither observe nor receive social reinforcement) X trials (eight trials) repeated measures ANOVA was computed. Note that this study's MYTH classifications are ignored in this analysis. That is, those children in the direct condition are only intermediate children, those in the observe condition are either Type A or Type B children, and those in the control condition are intermediate, Type A and Type B children.

The results of this analysis are summarized in Table 6. The main effect of sex was significant ($p=.009$), with girls outperforming boys (girls $M=65.4$, boys $M=59.6$). Neither the condition main effect ($p=.23$) nor the sex X condition interaction ($p=.80$) were significant, however. Finally, the trials X condition interaction was significant ($p=.05$), although no other interactions with the trials factor were significant ($p>.05$).

Since the trials X condition interaction was found to be significant, exploratory t-tests were conducted comparing direct to control, observe to control, and direct to observe conditions for the eight performance trials. The results of these tests are presented in Tables 7, 8, and 9, respectively, and the means for the three conditions are shown graphically in Figure 2. Although differences in performance between the observe and control conditions, and between the direct and observe conditions were not significant on any of the eight trials, differences in performance between the direct and control conditions were significant on a number of trials. On trial six and trial seven, children in the direct condition performed significantly better than children in the control condition (p=.01, and p=.05, respectively. Additionally, on trial three, trial five, and trial eight children in the direct condition performed marginally better than children in the control condition (p=.06, p=.06, and p=.06, respectively). These findings suggest that receiving direct social reinforcement did result in significantly better digit-symbol performance than receiving no social reinforcement on some trials.

Furthermore, these results show that observing reinforcement did increase digit-symbol performance to a level indistinguishable from direct reinforcement, although not to a level significantly better than receiving no social reinforcement. On all trials, however, children who observed reinforcement performed better than children who neither observed nor received social reinforcement. It is of interest to note that on trial two, the children who observed reinforcement performed better than the children who received direct reinforcement. On no other trials did the observing children perform better than the directly reinforced children. The higher performance of observing children on trial two, although not significant (p=.66), resembles the performance burst of observing children seen in the findings of Ollendick and his colleagues.

In summary, two sex X condition X classification X trials ANOVA'a were computed on digit-symbol performances; one for Type A and Type B children, and one for intermediate children. An additional condition X classification X trials ANOVA was computed for Type A and Type B children, as sex was not found to interact with any of the other factors in the initial ANOVA. A sex X condition X classification X trials ANOVA was then computed on all children's digit-symbol performance scores. Finally, a sex X condition X trials ANOVA was computed on all children ignoring MYTH classifications, in order to compare the results of this study with those of Ollendick and his colleagues.

In general, results indicate that girls performed significantly better on the digit-symbol substitution task than boys. Type A and Type B children did not perform significantly differently overall, however, the pattern of Type A childrens' performance was more variable, evidencing both significant performance bursts and declines. Direct social reinforcement was found to have a facilitating effect on performance in comparison to no reinforcement, however, observing social reinforcement only mildly facilitated performance and did not debilitate performance. Finally, the performance levels of dyads which worked in the presence of social reinforcement was significantly greater than the performance levels of dyads working in the absence of social reinforcement. The reinforcement did not have specific effects within the dyad, however.

Affective responses

Initially, a multivariate analysis of variance (MANOVA) on the nine affective response measures was considered. However, due to the low number of significant correlations between the affective response variables (only five correlations significant, $p<.05$), separate univariate sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) ANOVA's were computed for each of the variables. No analysis was conducted on positive evaluations of the coactor because these were not recorded for any child on any trial. In addition to the univariate analyses, an overall affective response score was computed by summing the nine affective response scores for each child, and a separate sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) ANOVA was computed on this overall score. Means and standard deviations for the affective response variables are presented in Table 10.

For attention to the coactor (ATCO), significant main effects were found for sex ($p=.001$) and condition ($p=.02$). Type A and Type B boys attended to their coactors significantly more than Type A and Type B girls (boys $M=1.70$, girls $M=.46$). Furthermore, significantly more children in the experimental condition attended to their coactors than in the control condition (experimental M=1.52, control M=.64), indicating that children observing a coactor receive reinforcement attended significantly more to that coactor than to a coactor not receiving reinforcement. This latter finding is qualified by a significant condition X classification interaction for ATCO (p=.02). A summary of the ATCO ANOVA is presented in Table 11.

Tests for simple effects for the condition X classification interaction for ATCO are presented in Table 12. These indicate that Type A children did not attend significantly more to their coactors in the experimental condition (Type A experimental M=1.15) than they did to their coactors in the control condition (Type A control M=1.14, p>.05). However, Type B children in the experimental condition did attend to their coactors significantly (p=.009) more than Type B children in the control condition (experimental Type B M=1.86, control Type B M=.14). In addition, Type B children in the control condition attended to their coactors significantly less than Type A children in either experimental or control conditions (p=.03, and p=.005, respectively). However, Type B children in the experimental condition did not attend to their coactors significantly more than Type A children in the experimental or control conditions (p=.36, and p=.30, respectively). These findings indicate that whether one's coactor received social reinforcement affected Type B's attention to that coactor more than it affected Type A's attention to that coactor.

Finally, the sex X condition interaction for ATCO was marginally significant ($p=.07$), indicating that Type B boys attended to their coactors slightly more than Type A boys (boys Type B $M=1.79$, boys Type A $M=1.62$), while Type A girls attended to their coactors slightly more than Type B girls (girls Type A $M=.57$, girls Type B $M=.36$).

Negative self-evaluations were found to occur significantly ($p=.05$) more for boys than girls (boys $M=.33$, girls $M=.00$). A summary of this ANOVA may be found in Table 13. Furthermore, boys displayed slightly more physical expressions of anxiety or tension than girls, although with marginal significance, (boys $M=1.52$, girls $M=.75$, $p=.07$). No other main effects nor interactions were found significant for negative self-evaluations or physical expressions of anxiety or tension. Finally, for attention to the experimenter, positive self-evaluations, negative coactor evaluations, and comparisons indicating either oneself or one's coactor better, no significant main effects nor interactions were found ($p>.05$).

In the ANOVA conducted on overall affective response scores, several interesting findings emerged. Boys exhibited significantly more ($p=.0003$) overall affective responding than girls (boys $M=5.93$, girls $M=2.43$). In addition, children in the experimental condition exhibited significantly more ($p=.02$) overall affective responding than children in the control condition (experimental M=5.22, control M=3.12). Finally, a marginally significant condition X classification interaction (p=.06) qualifies this latter result, indicating that Type B children in the experimental condition had the highest level of affective responding (Type B experimental M=6.21), while Type B children in the control condition had the lowest level of affective responding (Type B control M=2.36). Type A children in the experimental and control conditions had affective responding at similar, moderate levels (experimental M=4.15, control M=3.86).

In summary, separate sex X condition X classification ANOVA's were conducted on eight of the affective response variables. Additionally, overall affective resonding was tested in a separate sex X condition X classification ANOVA.

In general, these results indicate that for Type A and Type B children, boys attended to their coactors significantly more than girls, and that children in the experimental condition attended to their coactors significantly more than children in the control condition. It was also found that whether one's coactor received social reinforcement affected Type B children's attention to that coactor more than Type A children's attention to that coactor. Finally, boys displayed significantly more negative self-evaluations, slightly more physical displays of anxiety or tension, and significantly higher overall affective responding than girls.

Open-ended questions

Because children's ratings of their own performances and their coactors' performances were significantly related ($p=.0006$), these were analyzed in a sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) MANOVA. Two separate 2 X 2 X 2 MANOVA's were computed; one for Type A and Type B children who either observed or did not observe social reinforcement (see Table 14), and one for intermediate children who either received or did not receive social reinforcement in the presence of either Type A or Type B children (see Table 15).

For Type A and Type B children, no main effects nor interactions for ratings of one's own performance were found significant. This includes the main effects of sex ($p=.12$), condition ($p=.88$), and classification ($p=.23$), and the condition X classification interaction, ($p=.84$). Of particular interest, the non-significant classification main effect indicates that Type A children rated their own performance no better than Type B children (Type A $M=1.78$, Type B $M=1.54$), and that Type A and Type B children observing another receive social reinforcement rated their own performances similarly to those not observing another receive social reinforcement (experimental $M=1.67$, control $M=1.64$).

Differential ratings of the coactors' performances by

Type A and Type B children produced a marginally significant condition main effect (p=.07). That is, Type A and Type B children who observed others receive social reinforcement rated those children's performances higher than the performances of coactors who did not receive social reinforcement (experimental M=2.00, control M=1.46). The main effects for ratings of the coactors' performances for sex (p=.17), and classification (p=.89), and the condition X classification interaction (p=.70) were all not significant.

Intermediate children's ratings of their own performances revealed no significant main effects nor interactions. This includes the sex main effect (p=.82), the condition main effect (p=.82), and the classification main effect (p=.82), as well as the condition X classification interaction (p=.25). Of particular interest, the non-significant condition main effect indicates that intermediate children who received social reinforcement rated their own performances no better than the children who did not receive social reinforcement (experimental M=1.82, control M=1.86).

The intermediate children's ratings of their coactors' performances also revealed no significant main effects nor interactions. Included are the main effects of sex (p=.84), condition (p=.89), and classification (p=.59), as well as the condition X classification interaction (p=.25).

In order to determine if children's ratings of their own and their coactor's performances implied a comparison of their performances, chi-square analyses were conducted on effects of interest. Children in the experimental condition did not differ significantly from those in the control condition in implying and not implying comparisons, χ^2 =.001, p=.92, nor did Type A children differ from Type B children, χ^2 =.98, p=.32, nor intermediate children working with Type A versus Type B children, χ^2=.16, p=.69.

To determine whether children differed in making an overt comparison of performance in response to questions from the experimenter about their own and their coactors' performances, additional chi-square analyses were conducted on effects of interest. Children in the experimental condition made no more overt comparisons than did children in the control condition, χ^2=.016, p=.90. Type A children also did not differ significantly from Type B children in making overt comparisons, χ^2 =2.59, p=.11, nor did intermediate children working with Type A versus Type B children, χ^2=.15, p=.70 differ.

In summary, two sex X condition X classification MANOVA's were computed on children's ratings of their own and of their coactors' performances; one for Type A and Type B children, and one for intermediate children. Additionally, chi-square analyses of the occurrence/non-occurrence of implied and direct comparisons were performed on effects of interest, including experimental versus control, Type A versus Type B, and intermediate children working with Type A versus Type B children.

In general these results indicate that Type A and Type B children's ratings of their own performances, and intermediate children's ratings of their own and of their coactors' performances did not produce any significant main effects nor interactions in the analyses. However, Type A and Type B children who observed coactors receive social reinforcement rated those children's performances marginally higher than the performances of coactors who did not receive social reinforcement. No differences in making either implied or direct comparisons were found between Type A and Type B children, between the experimental and control conditions, nor between intermediate children working with Type A versus Type B children.

Self-report measure

Initially, two multivariate analyses of variance (MANOVA's) on the seven items of the self-report measure were considered for the Type A and Type B children, and for the intermediate children. However, due to the low number of significant correlations between the items (only five correlations significant, $p<.05$), separate univariate sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) ANOVA's were computed for each of the items. These ANOVA's were computed separately for the Type A and Type B children, and for the intermediate children. In addition, total scores for the children's self-report items were computed, and separate sex of subject (male, female) X condition (experimental, control) X classification (Type A, Type B) ANOVA's were computed for the Type A and Type B children, and for the intermediate children.

For intermediate children, significant main effects for sex ($p=.02$) and classification ($p=.03$) were found for their ratings of how much they wanted the other child to be their friend. A summary of this analysis is presented in Table 16. These results indicate that intermediate girls wanted the other child to be their friend more than intermediate boys (girls $\underline{M}=4.93$, boys $\underline{M}=4.59$), and that intermediate children wanted the Type A child to be their friend more than the Type B child (Type A $\underline{M}=4.93$, Type B $\underline{M}=4.61$). Intermediate girls also reported liking the experimenter (a female) significantly more ($p=.008$) than intermediate boys (girls $\underline{M}=4.96$, boys $\underline{M}=4.52$). Intermediate children working with a Type A child also reported liking the experimenter more than those working with a Type B child (Type A $\underline{M}=4.89$, Type B $\underline{M}=4.61$), although this result was only marginally significant ($p=.08$). Also marginally significant was the main effect for classification ($p=.06$) for intermediate children's ratings of how much they enjoyed the task, where intermediate children working with a Type A child enjoyed the task slightly more than those working with a Type B child (Type A $\underline{M}=4.33$, Type B $\underline{M}=3.82$).

In the analysis conducted for the Type A and Type B children, it was found that Type A and Type B children who observed another receive social reinforcement reported enjoying the task significantly less ($p=.03$) than those who did not observe another receive social reinforcement (experimental $\underline{M}=3.59$, control $\underline{M}=4.30$). A summary of this analysis is presented in Table 17. For the other self-report items, no other main effects nor interactions were found significant ($p>.05$).

Finally, in the ANOVA computed on the total scores for the self-report items for the intermediate children, no main effects nor interactions were significant ($p>.05$). Furthermore, no main effects nor interactions were found significant in the ANOVA computed on the Type A and Type B children's total scores for the self-report items.

In summary, separate sex X condition X classification ANOVA's were computed on each of the self-report items, alternately for the Type A and Type B children, and for the intermediate children. Additionally, total scores for the self-report measure were computed, and sex X condition X classification ANOVA's were computed on these scores separately for the Type A and Type B children, and for the intermediate children.

In general, these results indicate than intermediate girls wanted the other child to be their friend significantly more, and liked the experimenter significantly more than intermediate boys. In addition, intermediate children wanted the Type A coactor to be their friend significantly more than the Type B coactor. Finally, Type A and Type B children who observed their coactors receive social reinforcement enjoyed the task significantly less than those who did not observe their coactor receive social reinforcement.

Discussion

Overall, results of the present study lend partial support to previous findings of vicarious reinforcement which indicate that the delivery of social reinforcement may have facilitating effects on the performance of those receiving the reinforcement, and slightly facilitating effects on the performance of those observing the delivery of reinforcement to another. In addition, this study demonstrated that the performance of the dyad as a whole was facilitated when reinforcement was delivered to only one of the children within the dyad. However, individuals within the dyad who actually received social reinforcement did not perform significantly better than their non-reinforced peers. Thus, direct reinforcement did not have a specific facilitating effect on performance for children working in the presence of a peer, but it did have a generalized facilitating effect on the dyad's performance. Such findings lend mild support to Kazdin's (1973, 1979) view that observed reinforcement serves as a stimulus cue that similar performance may be followed by actual reinforcement for the observer.

The findings of Ollendick and his colleagues (1983, 1984) were not supported by the results of this study. Clearly, the performance of children who observed another receive social reinforcement was not debilitated in comparison to the performance of peers who did not observe another child receive social reinforcement. The implicit punishment hypothesis used by Ollendick and his colleagues to explain the debilitating effect on performance of observing reinforcement of a coactor assumes that social reinforcement has different effects on the two children within the dyad. That is, social reinforcement should significantly increase the performance of the directly reinforced child, while the observing peer's performance should initially increase and then decline. It is possible that because the performance of directly reinforced children was not significantly better overall than the performance of their non-reinforced peers, the observing children did not perform as though they were being implicitly punished as Ollendick et al. (1984) have suggested.

These findings suggest, then, that social reinforcement did not have differential effects on the performance of children who received reinforcement in comparison to those who observed the delivery of reinforcement to a coactor, a finding which fails to support the implicit punishment hypothesis used by Ollendick et al. (1983). Instead, it appears that the performance of coactors differed as a function of the presence or absence of social reinforcement in the experimental situation itself, providing support for Kazdin's (1973, 1979) hypothesis that the reinforcement serves as a discriminative stimulus for both children observing and receiving reinforcement.

The assignment of Type A, Type B, and intermediate children to particular experimental conditions also may have contributed to the fact that these findings fail to support the work of Ollendick and his colleagues (1983, 1984). Ignoring these assignments, a comparison of the performance of directly reinforced children, children who observed the reinforcement of a coactor, and control children who neither received nor observed reinforcement revealed that overall these children did not perform significantly differently from each other. However, both directly reinforced and observing children were found to perform somewhat better on all trials than control children. Furthermore, on trials six and seven, directly reinforced children performed significantly better than control children, and on trials three, four, and eight their performance was better with marginal significance. Thus, direct reinforcement was found to have some significant, albeit inconsistent effects in this analysis.

In addition, there was a non-significant trend indicating that directly reinforced children performed better than children observing reinforcement on all trials except trial two, where this trend was reversed. On no trials, however, did directly reinforced children perform significantly better than children who observed reinforcement, nor did the observing children perform significantly better than the control children on any trials. Thus, observing reinforcement had neither clearly facilitating nor inhibiting effects on performance.

In summary, although ignoring differential assignment of children to conditions, these particular results fail to support the hypothesis that observing reinforcement of a coactor produces debilitating effects on performance. Rather, observing reinforcement had a mildly facilitating effect on the performance of observing peers, and a clear facilitating effect on the performance of directly reinforced peers.

An additional reason these results may not have supported Ollendick et al.'s (1983) findings is that children were free to interact during the trials. Sharpley (1982) found such interaction to facilitate the vicarious reinforcement effect for coacting pairs. Unfortunately, it is not possible to compare the interaction levels of children who served as subjects for this study with the interaction levels of children in previous studies.

Also of interest was the question of whether Type A and Type B children performed differently as a function of observing and not observing another child receive social reinforcement. The findings of the present study show that the performance of Type A and Type B children was not differentially affected as such. Furthermore, Type A children did not perform significantly better overall than Type B children. However, when the significant sex difference which showed that girls performed better on the task than boys is dropped from the analysis, the performance of Type A children was found to vary across the trials in different pattern than the performance pattern of Type B children.

These findings suggest, then, that regardless of experimental condition, Type A children working in the presence of an intermediate coactor may perform in a different manner than Type B children, in that the Type A children exhibited both significant performance bursts and declines. These findings support the hypothesis that Type A children react differently in a competitive situation than Type B children. However, the competitiveness of the situation, as reflected by Type A and Type B children's performance levels on the task, was not found to be increased by the presence of social reinforcement. One might speculate that other factors which potentially alter the competitiveness of the situation would have differential effects on Type A and Type B children's performance levels. For example, having several children observe one child receive reinforcement, or explicit experimenter instructions to compete might produce a more competitive atmosphere and thus affect Type A and Type B children's performances differentially. Furthermore, use of the competitiveness factor of the MYTH ratings may have more accurately predicted performance in a competitive situation than the overall MYTH rating.

Finally, the findings of the present study show clear sex differences in performance, supporting the same findings of Ollendick and his colleagues. Type A and Type B girls consistently performed better on the digit-symbol substitution task than Type A and Type B boys. Intermediate boys and girls did not show significant performance differences. However, girls were found to perform significantly better than boys overall. Given Wechsler's (1949) documentaion of a similar sex difference for performance on a highly similar task, these findings are not surprising.

Children's behavioral responses during the experimental session, as well as their responses to open-ended questions and a self-report rating scale following the experimental session, provide some illumination regarding the processes which may have produced the performance results found in this study. Affective response results should be considered cautiously, however, as reliability was only obtained on the scoring of experimenters' reports of the behaviors, and not on the actual observations of the behaviors.

Girls, who were found to perform significantly better than boys on the digit-symbol substitution task, exhibited clear behavioral differences during the experimental session. They paid significantly less attention to their coactors, and made significantly fewer negative self-evaluations than boys. Such behaviors may have interfered with performance, thus contributing to the lower performance levels of boys. Girls also displayed somewhat fewer physical expressions of anxiety or tension, such as heavy sighing, neck-rubbing, foot- or pencil-tapping, etc.

Finally, boys displayed more behavioral responses overall than girls. Eaton and Keats (1982) also found higher motor activity levels in preschool boys, so these results are not surprising.

Girls and boys also differed somewhat in their responses to post-session questioning and the self-report measure. Intermediate girls reported liking the experimenter significantly more, and wanting the coactor to be their friend significantly more than did the boys. These results are not surprising given that the experimenter was always a female. However, girls' ratings of their own performances and their coactors' performances were not significantly different than the boys' ratings. Thus, although the girls performed significantly better, they neither rated their own performances higher nor their coactors' performances lower. In contrast, boys, who performed worse than girls, did exhibit more negative self-evaluations during the task. Taken together, the boys' self-evaluations more accurately reflected their performances than the girls' self- or coactor-evaluations.

Children in the experimental condition, who overall performed better than children in the control condition, also exhibited some behavioral differences during the experimental session, and differences in responses to post-session questioning. Both Type A and Type B children paid more attention during the experimental sesssion to their coactors who were being reinforced than they did to their coactors who received no reinforcement. The Type A and Type B children in the experimental condition also displayed more behavioral responding overall than those in the control condition. In addition, Type A and Type B children rated their coactors' performances somewhat higher when they had observed the coactors being reinforced than when they had not observed the coactors being reinforced. However, regardless of classification, children in the experimental condition made no more direct nor implied comparisons of performance than children in the control condition, nor did they rate the situation as more competitive. Taken together, these findings suggest that both the Type A and Type B children were aware that their coactors were receiving reinforcement, and that this differential reinforcement increased the attention they paid to the reinforced coactor. The evidence suggests, however, that increased attention by Type A or Type B children to a coactor who received reinforcement did not result in a concomitant increase in their use of comparison processes, nor a concomitant increases in their ratings of the competitiveness of the situation.

Finally, the Type A and Type B children who observed another child receive social reinforcement (experimental condition) reported enjoying the task significantly less than the Type A and Type B children who did not observe another child receive social reinforcement (control condition). Therefore, although observing another child receive social reinforcement significantly decreased enjoyment of the task for Type A and Type B children, observing reinforcement had mildly facilitating, rather than debilitating effects on performance. This combination of performance and self-report data thus lends partial support to the implicit punishment hypothesis. That is, children's affect, although not their performance, was adversely affected by observing a coactor receive social reinforcement.

Type A and Type B children were not found to perform differently overall from each other on the digit-symbol substitution task regardless of whether or not they observed another child receive social reinforcement. Type A children did show a significantly different pattern of performance across the eight trials than Type B children. The Type A children did not display different behaviors during the trials than the Type B children overall, however, nor did they respond differentially to post-session questioning overall.

These results show that overall, Type A children paid no more attention to their coactors, made no more direct or implied comparisons of performance, rated the situation as no more competitive, nor rated their own or their coactors' performances any differently than Type B children. These results, therefore, do not support the hypothesis that Type A children enegaged in any more comparison processes overall than Type B children. Furthermore, these results fail to support the finding of Matthews and Siegel (1983) which showed Type A children compared their performance against a superior coactor regardless of the absence or presence of an explicit performance standard. The variability in Type A's performance in comparison to the performance of Type B children cannot, therefore, be explained by concluding that comparison processes were responsible, nor can it be explained by concluding that Type A children felt that the situation was more competitive. This variability may have been due to Type A children attempting to assert more control over the experimental situation (Matthews, 1979), or alternately may reflect Type A children's efforts to excel in a situation with ambiguous performance criteria (Matthews & Volkin, 1981). Unfortunately, self-reports and observations of behaviors of the Type A children do not adequately test these possibilities.

Of particular interest is the finding that Type B children paid significantly more attention to coactors who received social reinforcement than to coactors who received no social reinforcement. Type A children, however, did not differ in the attention they paid to socially reinforced versus non-reinforced coactors. Further, the amount of attention paid to coactors by Type A children was less than that of Type B children observing coactors receive reinforcement, but significantly greater than that of Type B children not observing coactors receive reinforcement. These results fail to support the findings of Matthews and

Siegel (1983), who found that Type B children only compared their performance to that of a superior coactor in the <u>absence</u> of an explicit performance standard. Type A children's lack of differential attention to reinforced coactors may be explained by the finding of Matthews and Brunson (1974) which showed that Type A individuals allocate more attention to a task at hand and actively ignore task-irrelevant stimuli. It thus appears that although the performance of Type B children across the experimental and control conditions did not differ, their attention to a coactor was increased significantly when that coactor was being reinforced.

The use of teachers' overall MYTH ratings of children in this study replicates the MYTH rating assignment procedure used by Matthews and her colleagues. Since the MYTH ratings have been found to be comprised of two orthogonal factors, however, such an assignment procedure must be considered to have shortcomings for interpreting the results obtained in this study. For example, chiledren classified as Type A by their overall MYTH score may have been high on the impatience-aggression factor, high on the competitiveness factor, or moderate on both factors. Hence, the Type A construct is not unified, rather it is multi-dimensional. Thus, observations of behavior or performance differences between Type A and Type B children may not be explained adequately by the children's overall MYTH scores. Instead, the relative contributions of each of the factors to differences in observed for Type A and Type B children's performances and behaviors is an interesting and important area for further exploration.

In summary, direct reinforcement did not produce consistent, specific, facilitating effects on performance of children working in the presence of a coactor, although on some trials, directly reinforced children's performances were found to be significantly better than the performances of control children. Observing another child receive reinforcement did not produce debilitating effects on performance, rather the slightly facilitating effects found fail to support the major findings of Ollendick and his colleagues. However, these results provide only marginal support for a vicarious reinforcement interpretation in that observing children's performances were not significantly increased. In addition, children working in dyads in the presence of social reinforcement in the experimental situation did perform better overall than when working in the absence of social reinforcement.

Behavioral responses and post-session self-reports of children were also clearly affected by the experimental manipulation. Type A and Type B children paid more attention to reinforced coactors than non-reinforced coactors, rated the performances of reinforced coactors higher than that of non-reinforced coactors, and reported enjoying the task less when observing a coactor receive reinforcement. Thus, while observing another child receive reinforcement adversely affected enjoyment of the task, these findings provide mild support for a vicarious reinforcement interpretation that observing another child receive reinforcement has facilitating effects on performance, and produces increased attention to, and higher ratings of the performance of reinforced coactors.

Second, Type A children overall performed no better than Type B children, although the patterns of Type A and Type B children's performances were significantly different, with Type A children exhibiting both significant performance bursts and declines. The presence of social reinforcement was not found to increase the rated competitiveness of the situation for the Type A children, however. Behaviorally, increased attention to a reinforced coactor did not result in a concomitant increase in the use of comparison processes by either Type A or Type B children. However, the attention Type B children paid to their coactors was more greatly affected depending on whether that coactor was reinforced than was the attention paid to coactors by Type A children. Thus, although Type A children's performances were more variable than Type B children's, this result was not due to increased use of comparison processes by Type A children. In fact, Type B children's behaviors varied more as a function of the experimental manipulation, while Type A children's performances varied regardless of the experimental manipulation.

Finally, girls were found to perform better than boys overall. Behaviorally, girls also displayed less performance-interfering behaviors, such as attending to the coactor, negative self-evaluations, and physical expresssions of anxiety and tension. Boys' self-ratings of their performances were more accurate, however, than girls' ratings of performances. Finally, girls reported liking both the experimenter and their coactors more, probably an effect produced by the presence of a female experimenter.

There are at least four possible reasons the performance results of this study did not support the findings of Ollendick and his colleagues. First, the assignment of Type A, Type B, and intermediate children differentially to conditions may have resulted in dyadic combinations that did not produce the debilitating effects on performance of observing another receive reinforcement. Second, the present study was conducted within two weeks in a school which had just completed a two-week, intra-grade "math bee" competition. It is possible that the "rebound effect" found by Ollendick et al. (1983) contaminated the present results, causing observing children to make a more concerted effort to procure praise as they did in the second experimental session employed by Ollendick et al. (1983). It is also possible that within the experimental session, insufficient time elapsed to produce the potentially debilitaing effects of vicarious reinforcement for these dyads which were specifically composed of Type A and Type B observing children. Finally, the free interaction permitted during the trials may have actually facilitated the vicarious reinforcement effect, as suggested by Sharpley (1982).

Thus, the present study provided support for the hypothesis that vicarious reinforcement has mildly facilitating effects on performance, although it may adversely affect the enjoyment of a task for observing children. In addition, Type A children's performances were found to vary more regardless of the experimental manipulation, although Type B children's behaviors were found to vary more as a function of the experimental manipulation.

There are several implications of these results for those employing vicarious reinforcement procedures in applied settings. First, these procedures may be quite useful for changing the behaviors of several individuals at the same time when it is difficult to deliver reinforcement to all. This study did not show any debilitating effects on the performance of individuals observing reinforcement, although the slightly negative affective reaction may be of concern in applied settings where children's enjoyment of a task and their motivation to perform is considered important. In additon, it was observed that Type A and Type B children did not perform differently in response to observing reinforcement, although their responses to direct reinforcement were not tested by this study. Because Type A children's performances were more variable than Type B children's, however, teachers who rate children as more aggressive, impatient or competitive should be aware that these children's performances on tasks may vary regardless of environmental factors such as teacher praise and attention.

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Appendices

Table 1

Mean MYTH ratings of Type A and Type B boys and girls.

Sex	MYTH Rating	Type A M	Type A SD	Type B M	Type B SD
	Competitiveness	32.57	(3.88)	18.64	(5.31)
Girls	Impatience-Aggression	31.00	(4.87)	17.00	(3.92)
	Total	63.79	(5.01)	35.64	(6.45)
	Competitiveness	34.08	(5.09)	18.00	(5.07)
Boys	Impatience-Aggression	32.46	(5.71)	20.71	(5.62)
	Total	66.54	(5.99)	38.71	(7.69)

Table 2

Analysis of variance summary for Type A and Type B children's digit-symbol performance scores.

Source	MS	df	F	p
Sex (A)	6116.45	1	6.52	.01
Condition (B)	2595.50	1	2.77	.10
Classification (C)	1228.32	1	1.31	.26
A X B	9.10	1	<1.00	.92
A X C	1057.70	1	1.13	.29
B X C	220.42	1	<1.00	.63
A X B X C	4.32	1	<1.00	.95
Error Between	44108.44	47		
Trials (T)	616.76	7	23.73	<.0001
T X A	27.20	7	1.42	.23
T X B	31.90	7	1.32	.26
T X C	29.87	7	2.18	.06
T X A X B	33.77	7	<1.00	.53
T X A X C	32.56	7	1.61	.16
T X B X C	13.97	7	<1.00	.50
T X A X B X C	26.54	7	1.20	.33
Error Within	27.74	41		

Table 3

Selected t-tests on Type A and Type B children's digit-symbol performance scores.

		t	p
Type A			
Trial 1 versus Trial 8	+9.9	t(25)= 5.22	p=.0001
Trial 1 versus Trial 2	+6.6	t(25)= 5.46	p=.0001
Trial 6 versus Trial 7	-3.1	t(25)=-2.51	p=.02
Type B			
Trial 1 versus Trial 8	+11.1	t(26)= 6.79	p=.0001
Trial 1 versus Trial 2	+ 5.0	t(26)= 4.75	p=.0001
Trial 3 versus Trial 4	+ 1.9	t(26)= 2.05	p=.05
Type A versus Type B			
Trial 1		t(53)=1.32	p=.19
Trial 2		t(53)=1.68	p=.10
Trial 3		t(53)= .90	p=.37
Trial 4		t(53)= .68	p=.50
Trial 5		t(53)=1.12	p=.27
Trial 6		t(53)=1.60	p=.11
Trial 7		t(53)= .31	p=.75
Trial 8		t(53)= .59	p=.56

Table 4

Analysis of variance summary for intermediate children's digit-symbol performance scores.

Source	MS	df	F	p
Sex (A)	1693.29	1	1.88	.18
Condition (B)	1152.50	1	1.28	.26
Classification (C)	8.96	1	<1.00	.92
A X B	91.00	1	<1.00	.75
A X C	96.43	1	<1.00	.75
B X C	130.18	1	<1.00	.71
A X B X C	1139.83	1	1.26	.27
Error Between	901.32	47		
Trials (T)	1033.58	7	17.31	<.0001
T X A	10.79	7	<1.00	.69
T X B	44.05	7	1.32	.28
T X C	35.89	7	<1.00	.47
T X A X B	34.49	7	<1.00	.80
T X A X C	22.78	7	<1.00	.70
T X B X C	22.66	7	1.31	.27
T X A X B X C	29.60	7	1.16	.34
Error Within	31.90	41		

Table 5

Analysis of variance summary for all children's digit-symbol performance scores.

Source	MS	df	F	p
Sex (A)	7123.09	1	8.09	.005
Condition (B)	3603.54	1	4.09	.05
Classification (C)	723.52	1	<1.00	.37
A X B	78.82	1	<1.00	.77
A X C	896.43	1	1.02	.32
B X C	344.70	1	<1.00	.53
A X B X C	642.34	1	<1.00	.40
Error Between	880.95	102		
Trials (T)	1603.32	7	35.91	<.0001
T X A	26.68	7	1.56	.16
T X B	29.40	7	<1.00	.45
T X C	41.88	7	1.12	.36
T X A X B	60.13	7	1.33	.25
T X A X C	48.51	7	1.93	.07
T X B X C	21.97	7	1.17	.33
T X A X B X C	20.25	7	<1.00	.47
Error Within	29.41	96		

Table 6

Analysis of variance summary for all children's digit-symbol performance scores ignoring MYTH classifications.

Source	MS	df	F	p
Sex (A)	5795.54	1	7.18	.009
Condition (B)	1210.15	2	1.50	.23
A X B	179.97	2	<1.00	.80
Error Between	807.28	76		
Trials (T)	1292.93	7	38.42	<.0001
T X A	13.42	7	<1.00	.74
T X B	36.62	14	1.69	.05
T X A X B	26.99	14	1.25	.24
Error Within	21.66	532		

Table 7

t-tests comparing digit-symbol performance scores of children in direct versus control conditions for eight trials ignoring MYTH classifications.

	Direct		Control			
Trial	M	SD	M	SD	t(53)	p
Trial 1	56.6	(9.9)	53.7	(5.9)	1.32	.19
Trial 2	60.7	(10.6)	59.0	(7.4)	.71	.48
Trial 3	64.4	(10.8)	59.4	(7.9)	1.96	.06
Trial 4	65.0	(11.1)	61.3	(7.6)	1.45	.15
Trial 5	66.7	(11.4)	61.6	(8.4)	1.89	.06
Trial 6	70.0	(10.3)	63.4	(8.5)	2.62	.01
Trial 7	70.1	(12.7)	63.6	(11.6)	1.98	.05
Trial 8	70.4	(13.8)	64.2	(9.9)	1.92	.06

Table 8

t-test comparing digit-symbol performance scores of children in observe versus control conditions for eight trials ignoring MYTH classifications.

	Observe		Control			
Trial	M	SD	M	SD	t(53)	p
Trial 1	55.6	(11.8)	54.7	(5.9)	.78	.44
Trial 2	62.1	(12.5)	59.0	(7.4)	1.14	.26
Trial 3	63.4	(12.8)	59.4	(7.9)	1.39	.17
Trial 4	64.9	(13.7)	61.3	(7.6)	1.21	.23
Trial 5	65.7	(13.1)	61.6	(8.4)	1.39	.17
Trial 6	66.9	(13.7)	63.4	(8.5)	1.13	.26
Trial 7	65.3	(13.1)	63.6	(11.6)	.53	.60
Trial 8	66.9	(15.3)	64.2	(9.9)	.78	.44

Table 9

t-tests comparing digit-symbol performance scores of children in direct versus observe conditions for eight trials ignoring MYTH classifications.

	Direct		Observe			
Trial	M	SD	M	SD	t(52)	p
Trial 1	56.6	(9.9)	55.6	(11.8)	-0.31	.76
Trial 2	60.7	(10.6)	62.1	(12.5)	0.45	.66
Trial 3	64.4	(10.8)	63.4	(12.8)	-0.31	.76
Trial 4	65.0	(11.1)	64.9	(13.7)	-0.03	.97
Trial 5	66.7	(11.4)	65.7	(13.1)	-0.29	.77
Trial 6	70.0	(10.3)	66.9	(13.7)	-0.97	.34
Trial 7	70.1	(12.7)	65.3	(13.1)	-1.35	.18
Trial 8	70.4	(13.8)	66.9	(15.3)	-0.88	.38

Table 10

Mean affective response scores for Type A and Type B children.

Behavior	Type A M	Type A SD	Type B M	Type B SD	Combined M	Combined SD
Attention to Coactor	1.15	(1.35)	1.00	(1.81)	1.07	(1.59)
Attention to Experimenter	.63	(1.18)	1.18	(1.81)	.91	(1.54)
Positive Self-Evaluations	.48	(.75)	.54	(.88)	.51	(.81)
Negative Self-Evaluations	.04	(.19)	.29	(.85)	.16	(.63)
Positive Coactor-Evaluations	.00	(.00)	.00	(.00)	.00	(.00)
Negative Coactor-Evaluations	.04	(.19)	.04	(.19)	.04	(.19)
Comparison-Self Better	.19	(.40)	.29	(1.01)	.24	(.77)
Comparison-Coactor Better	.15	(.60)	.04	(.19)	.09	(.44)
Physical Displays of Anxiety or Tension	1.33	(1.57)	.93	(1.49)	1.13	(1.53)
All Behaviors	4.00		4.29		4.15	

Table 11

Analysis of variance summary for Type A and Type B children's attention to the coactor (ATCO).

Source	MS	df	F	p
Sex (A)	21.02	1	12.28	.001
Condition (B)	10.64	1	6.22	.02
Classification (C)	.38	1	<1.00	.64
A X B	6.10	1	3.56	.07
A X C	1.52	1	<1.00	.35
B X C	9.52	1	5.56	.02
A X B X C	5.26	1	3.07	.09
Error	1.71	47		

Table 12

t-tests comparing Type A and Type B children's attention to the coactor (ATCO) in experimental and control conditions.

	t	p
Type A		
Experimental versus Control	t(25)=- .02	p=.98
Type B		
Experimental versus Control	t(26)=-2.82	p=.009
Experimental		
Type A versus Type B	t(25)=- .93	p=.36
Control		
Type A versus Type B	t(26)= 3.06	p=.005
Experimental Type A		
versus Control Type B	t(25)=-2.34	p=.03
Experimental Type B		
versus Control Type A	t(26)=-1.06	p=.30

Table 13

Analysis of variance summary for Type A and Type B children's negative self-evaluations.

Source	MS	df	F	p
Sex (A)	1.42	1	3.88	.05
Condition (B)	.44	1	1.20	.28
Classification (C)	.86	1	2.35	.13
A X B	.44	1	1.20	.28
A X C	.86	1	2.35	.13
B X C	.16	1	<1.00	.51
A X B X C	.16	1	<1.00	.51
Error	.36	47		

Table 14

Multivariate analysis of variance summary for Type A and Type B children's ratings of their own and their coactors' performances.

Source		MS	df	F	p
Sex (A)	-SELRAT	1.36	1	2.47	.12
	-OTHRAT	2.18	1	1.91	.17
Condition (B)	-SELRAT	.01	1	<1.00	.88
	-OTHRAT	4.02	1	3.52	.07
Classification (C)	-SELRAT	.82	1	1.48	.23
	-OTHRAT	.02	1	<1.00	.89
A X B	-SELRAT	.18	1	<1.00	.58
	-OTHRAT	.02	1	<1.00	.89
A X C	-SELRAT	.02	1	<1.00	.84
	-OTHRAT	.90	1	<1.00	.38
B X C	-SELRAT	.02	1	<1.00	.84
	-OTHRAT	.18	1	<1.00	.70
A X B X C	-SELRAT	.02	1	<1.00	.84
	-OTHRAT	3.85	1	3.37	.07
Error	-SELRAT	.55	47		
	-OTHRAT	1.14	47		

Table 15

Multivariate analysis of variance summary of intermediate children's ratings of their own and their coactors' performances.

Source		MS	df	F	p
Sex (A)	-SELRAT	.03	1	<1.00	.82
	-OTHRAT	.02	1	<1.00	.84
Condition (B)	-SELRAT	.03	1	<1.00	.82
	-OTHRAT	.01	1	<1.00	.89
Classification (C)	-SELRAT	.02	1	<1.00	.82
	-OTHRAT	.18	1	<1.00	.59
A X B	-SELRAT	.88	1	2.66	.11
	-OTHRAT	.90	1	1.48	.23
A X C	-SELRAT	.86	1	2.66	.11
	-OTHRAT	.01	1	<1.00	.89
B X C	-SELRAT	.44	1	1.36	.25
	-OTHRAT	.82	1	1.34	.25
A X B X C	-SELRAT	.16	1	<1.00	.49
	-OTHRAT	.47	1	<1.00	.39
Error	-SELRAT	.32	47		
	-OTHRAT	.61	47		

Table 16

Analysis of variance summary of intermediate children's self-reports of how much they wanted their coactor to be their friend.

Source	MS	df	F	p
Sex (A)	1.52	1	6.02	.02
Condition (B)	.50	1	1.96	.17
Classification (C)	1.31	1	5.19	.03
A X B	.03	1	<1.00	.73
A X C	.38	1	1.50	.23
B X C	.08	1	<1.00	.86
A X B X C	.19	1	<1.00	.39
Error	.25	47		

Table 17

Analysis of variance summary for Type A and Type B children's self-reports of how much they enjoyed the task.

Source	MS	df	F	p
Sex (A)	.49	1	< 1.00	.54
Condition (B)	6.41	1	5.04	.03
Classification (C)	.43	1	< 1.00	.57
A X B	.43	1	< 1.00	.57
A X C	.76	1	< 1.00	.44
B X C	1.29	1	1.01	.32
A X B X C	.15	1	< 1.00	.73
Error	1.27	46		

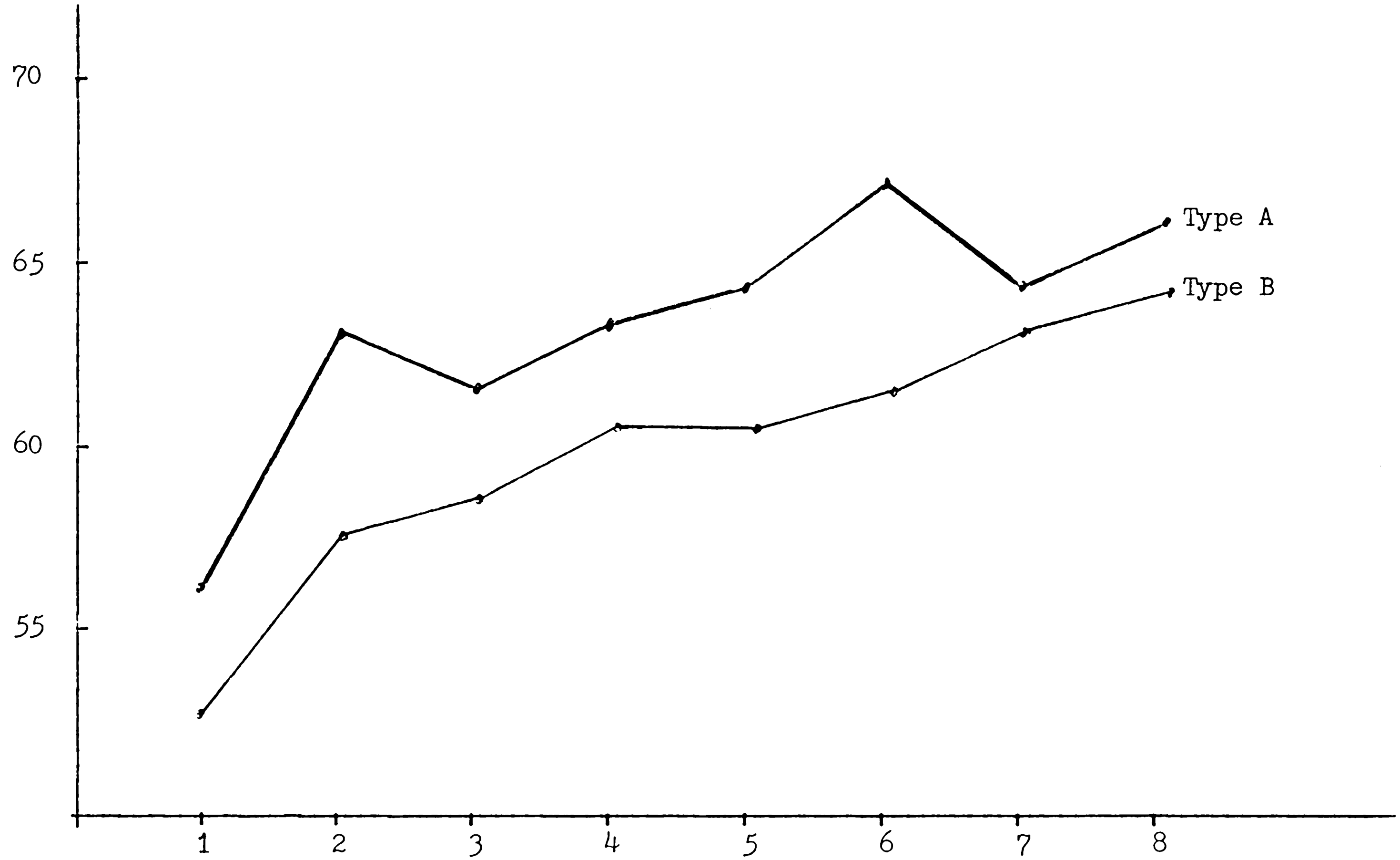

Figure 1. Mean digit-symbol performance across eight trials for Type A and Type B children.

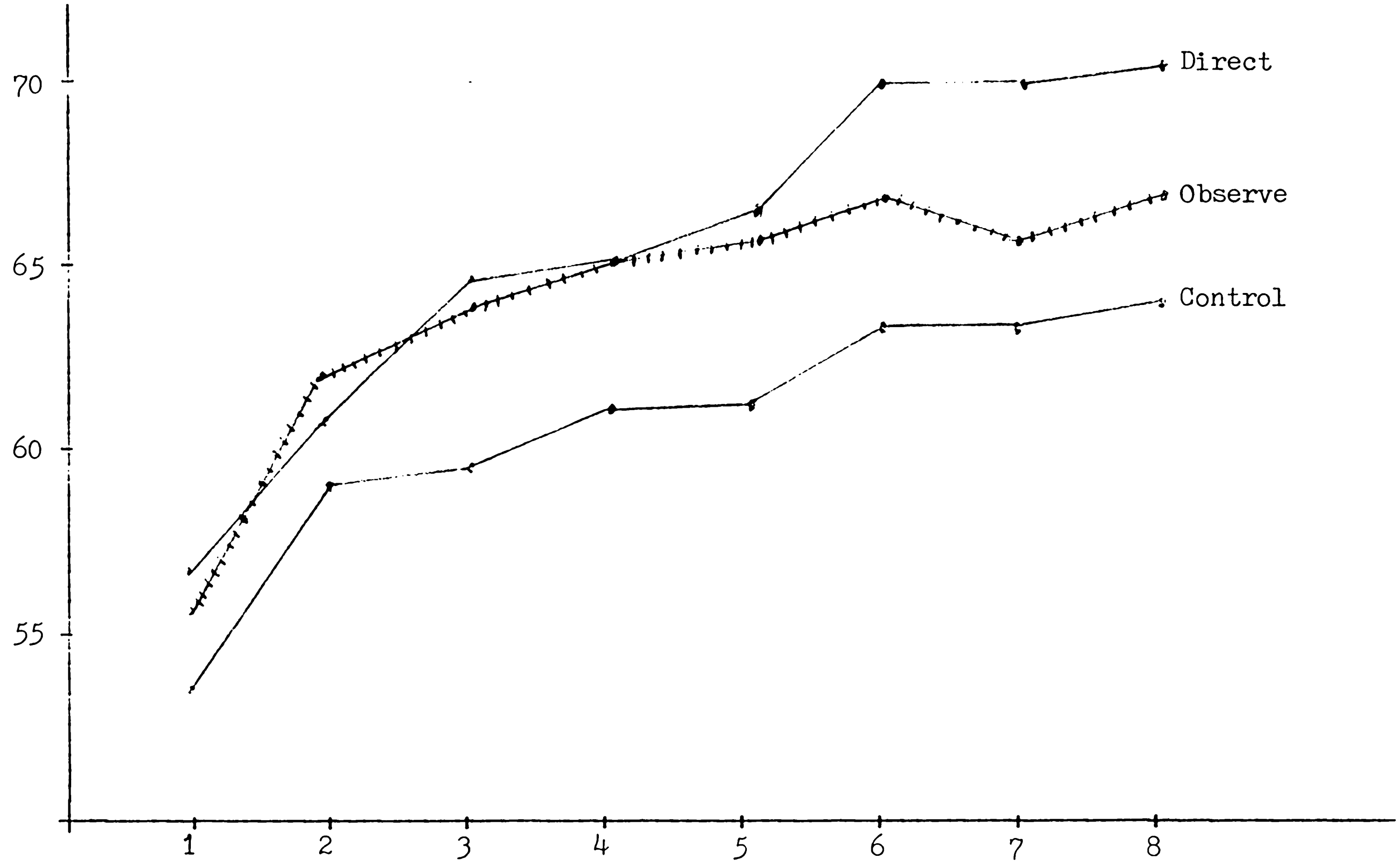

Figure 2. Mean digit-symbol performance across eight trials for children in direct, observe, and control conditions.

CHILD'S RATING SCALE

Please read the following statements below about the task you just finished, and indicate how much you agree with them by circling a number from 1 to 5. You may circle any number from 1 to 5 to indicate how you feel.

(1.) How much did you enjoy filling in the boxes using the key?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(2.) How much would you like to do this sort of thing again?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(3.) How much did you enjoy working with the other child doing the same thing?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(4.) How much would you like the other child to be your friend?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(5.) How much did you feel that you were being treated as fairly as the other child?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(6.) How much did you feel that you were competing with the other child?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

(7.) How much did you like the person who gave you the boxes to fill in?

1	2	3	4	5
not at all	a little	somewhat	quite a bit	very much

1	2	3	4	5
extremely uncharacteristic	uncharacteristic	neutral	uncharacteristic	extremely characteristic

11. This child is patient when working with children slower than he/she is.

    1 2 3 4 5

12. When working or playing, he/she tries to do better than other children.

    1 2 3 4 5

13. This child can sit still long.

    1 2 3 4 5

14. It is important to this child to win, rather than to have fun in games or schoolwork

    1 2 3 4 5

15. Other children look to this child for leadership.

    1 2 3 4 5

16. This child is competitive.

    1 2 3 4 5

17. This child tends to get into fights.

    1 2 3 4 5

18. How confident are you of the above ratings?

1	2	3	4	5
extremely unconfident	unconfident	neutral	confident	extremely confident

Thank you.

1	2	3	4	5	6
+	−	=	□	>	○

SAMPLE:

3	1	4	6	5	2	2	1	3	1	4	4	3	4	3

6	2	1	5	6	5	6	2	5	6	1	5	4	3	1

3	5	1	3	4	1	3	2	4	3	1	5	1	6	4

3	2	4	2	4	3	2	1	6	1	5	6	1	3	5

6	4	1	3	1	5	6	3	5	4	6	2	5	3	2

6	1	5	4	5	6	1	4	3	5	2	6	1	4	5

4	3	2	1	4	6	5	3	2	1	4	6	1	6	4

3	2	1	5	6	1	6	5	4	6	5	1	3	4	3

4	1	4	5	1	6

Name of child____ Age____________

Rater____

This rating scale is designed to assess various aspects of a child's behavior. Please mark how well the statement characterizes the child using the following scale:

1	2	3	4	5
extremely uncharacteristic	uncharacteristic	neutral	characteristic	extremely characteristic

1. **When this child plays games,** he/she is competitive.

   1 2 3 4 5

2. **This child works** quickly and energetically rather than slowly and **deliberately.**

   1 2 3 4 5

3. **When this child** has to wait for others, he/she becomes impatient.

   1 2 3 4 5

4. **This child** does things in a hurry.

   1 2 3 4 5

5. It **takes** a lot before this child gets angry at his/her peers.

   1 2 3 4 5

6. **This child** interrupts others.

   1 2 3 4 5

7. **This child** is a leader in various activities.

   1 2 3 4 5

8. **This child** gets irritated easily.

   1 2 3 4 5

9. **He/she seems** to perform better than usual when competing against others.

   1 2 3 4 5

10. **This child likes** to argue or debate.

    1 2 3 4 5

(PLEASE TURN OVER)

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