

Interpersonal Problem Solving, Externalizing Behavior, and Social Competence in Preschoolers: A Knowledge-Performance Discrepancy?

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A modified interpersonal problem-solving paradigm was developed to discriminate between response access/production and response availability in preschoolers. Examination of the sequence of preschoolers' solutions to hypothetical interpersonal dilemmas revealed increased competence in response to directive probes, suggesting that children possessed knowledge about prosocial problem solving that was not reflected in their spontaneous behavior. Similar patterns emerged in nonsymptomatic youngsters and those with externalizing behavior problems, but the latter group showed overall deficits. Social problem-solving styles predicted teacher ratings of children's behavioral and social adjustment. Conceptual, methodological, and applied implications of the findings are discussed.

A considerable body of literature implicates peer competence in childhood as a strong predictor of concurrent and future behavioral and emotional adjustment (reviewed in Hops & Greenwood, 1988; Parker & Asher, 1987). Because of the potentially damaging long-term impact of disturbed peer relationships, researchers have attempted to identify early indicators and mediators of social difficulties. At the forefront of these efforts has been the development of social information-processing models of behavior, which delineate a series of steps that underlie typical social interactions (Dodge, 1986). The problem-solving stage of these models has received widespread empirical attention.

Pioneering work emphasized *quantitative* aspects of the interpersonal problem-solving process—that is, the number of solutions generated in response to social dilemmas (Shure

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& Spivack, 1980; Spivack & Shure, 1974). Research has linked the ability to produce alternative solutions with behavioral adjustment and peer acceptance/rejection in preschoolers (Arend, Gove, & Sroufe, 1979; Pettit, Dodge, & Brown, 1988; Shure & Spivack, 1980, 1982) and in school-age children (Asarnow & Callan, 1985; Dodge, Pettit, McClaskey, & Brown, 1986; Richard & Dodge, 1982; Rubin, Daniels-Beirness & Bream, 1984). However, attempted replications sometimes have yielded nonsignificant (Roopnarine, 1987; Rubin & Krasnor, 1986; Sharp, 1981; Spence, 1987; White & Blackham, 1985) or contradictory (Gouze, 1987) results. Thus, more recent efforts have stressed *qualitative* aspects of problem solving. In this vein, researchers have found that the content of social problem-solving strategies (e.g., aggressive, prosocial, avoidant) is associated in the predicted ways with social behavior and peer sociometric status (Asarnow & Callan, 1985; Asher, Renshaw, & Geraci, 1980; Deluty, 1981; Denham, Bouril, & Belouad, 1991, 1994; Gouze, 1987; Mott & Krane, 1994; Quiggle, Garber, Panak, & Dodge, 1992; see Kendall & Fischler, 1984; Meisel, 1989, for nonsignificant results).

These studies yield consistent evidence that impaired problem solving may undermine peer competence, particularly for children with externalizing behavior problems such as aggression and impulsivity. Yet important theoretical and practical questions remain as to the precise nature of problem-solving difficulties in socially maladjusted children. For example, children presumably progress through several steps during the problem-solving process, ranging from the retrieval or construction of possible solutions through the evaluation, selection, and enactment of behavioral responses. As researchers have pointed out, knowledge about socially competent solutions does not ensure their performance (Mize & Ladd, 1988). Rather, factors such as emotional arousal, impulsivity, self-efficacy cognitions, or outcome expectations may mediate between strategy availability and strategy access, selection, or enactment (Crick & Dodge, 1994; Denham et al., 1994; Folkman & Lazarus, 1988; Musun-Miller, 1993; Reid, 1991). Important differences may therefore emerge between "automatic" information processing, which may be influenced more strongly by such factors as immediate affective state or impulsivity, and "controlled" information processing, which may be more conscious and reflective in nature (Crick & Dodge, 1994). Consistent with this view, one study of nondelinquent and delinquent adolescents revealed improved problem-solving performance when task instructions targeted availability of knowledge about appropriate strategies rather than access of typical responses (Freedman, Rosenthal, Donahoe, Schlundt, & McFall, 1978).

Empirical studies of interpersonal problem solving in preschoolers have overlooked this conceptual distinction between response access/production and response availability. Assessment paradigms generally present a hypothetical social dilemma and elicit problem-solving strategies with probes such as: "What would you do/say?" The first strategy generated in response to these probes is believed to best match children's customary response style and, therefore, to be the strongest predictor of *in vivo* behavior (Mize & Cox, 1990). This study employed a supplementary prompting procedure (described later), designed explicitly to tap children's knowledge of appropriate social behavior under more reflective conditions.

Problem-solving competence was examined in a sample of preschoolers. Due to their general tendency toward increased impulsivity, preschoolers may be more susceptible to interference with the spontaneous retrieval and/or enactment of socially competent strategies. Additionally, a subsample of preschoolers with externalizing behavior problems was targeted; mediators such as negative affect, high self-efficacy for aggression, and impulsivity may pose particular challenges for these youngsters. The ecological validity of the assessment was maximized by using puppet enactment. This approach may encourage more spontaneous and realistic responses (both nonverbal and verbal) and may increase attention and motivation, particularly in young and impulsive children (Getz, Goldman, & Corsini, 1984; Mize & Cox, 1990; Mize & Ladd, 1988).

The objectives of this study were:

1. To develop a methodology that discriminates between spontaneous *access/production* of problem-solving strategies and *availability* of socially competent strategies in children's repertoires—It was predicted that all preschoolers would demonstrate increased knowledge about prosocial strategies following directive probes;
2. To examine the relative problem-solving competence of preschoolers with and without externalizing behavior problems—It was predicted that externalizers would exhibit less competent problem solving overall, and would continue to demonstrate greater deficits than a nonsymptomatic group, even after a series of directive probes; and
3. To determine the association between interpersonal problem solving as examined in the laboratory and children's social adjustment at school—It was predicted that decreased problem-solving competence would be associated with higher teacher ratings of externalizing behavior problems and aversive social behavior, and with lower teacher ratings of prosocial behavior.

METHOD

Overview of Procedures

This study is part of a larger longitudinal investigation of a community sample of preschoolers. Normally developing youngsters and those identified by teachers and/or parents to have behavioral or emotional difficulties were recruited from preschools and day-care centers. Cognitive, language, and social functioning were assessed during individual evaluation sessions. Teacher ratings were obtained by mail.¹

Participants

Thirty-two preschoolers participated in this study. Children ranged in age from 42 to 78 months ($M = 53$, $SD = 9.3$). Mental processing composite (MPC) scores on the Kaufman Assessment Battery for Children (which has a mean of 100) ranged from 81 to 132 ($M = 108$, $SD = 13.3$). Expressive language scores on the Reynell Developmental Language Scales ranged from 33 to 68 months ($M = 48$; $SD = 8.9$). The ethnic distribution was 63% Caucasian, 9% Latino, 6% African American, 3% Asian American, and 19% of mixed ethnicity.

Teacher Measures

Child Behavior Checklist—Teacher Report Form (CBCL-TRF; Achenbach & Edelbrock, 1983). Teachers were asked to rate the degree or frequency of occurrence of 118 problem behaviors on a scale of 0 (*Not at all* or *Never true*) to 2 (*Very much* or *Always true*). Factor analyses of this scale have yielded broad-band externalizing (e.g., “argues a lot,” “temper tantrums or hot temper”) and internalizing (e.g., “nervous, highstrung, or tense,” “unhappy, sad, or depressed”) dimensions. Children were categorized into two groups based on the broad-band syndromes. Those who scored 1.5 standard deviations or more above the mean on the externalizing dimension (T scores of 65 or higher) were designated as an externalizing group, whereas those who scored below 65 on both the externalizing and internalizing dimensions were designated as a nonsymptomatic group. According to these criteria, 10 children (5 boys, 5 girls) qualified for the externalizing group (M externalizing $T = 72$, $SD = 3.97$) and 22 children (9 boys, 13 girls) qualified for the nonsymptomatic group (M externalizing $T = 54$, $SD = 6.22$). T tests indicated that groups did not differ significantly in age, gender, MPC, or expressive language ($ps > .10$).²

Social Competence Scale. Teachers completed ratings of children’s social competence (Terry, Underwood, Coie, & Dodge, 1986). Two conceptually derived scales were formed from subgroups of relevant items: (a) a 9-item *prosocial behavior* scale—for example, ability to effectively enter a peer group, empathy towards peers (Cronbach’s alpha = .91) and (b) an 18-item *aversive behavior* scale—for example, physical and verbal aggression, disruptiveness, bragging (Cronbach’s alpha = .96).

Interpersonal Problem-Solving Task

Procedure. Children completed an analog measure of interpersonal problem solving. The experimenter presented four hypothetical vignettes designed to examine children’s responses to typical challenging peer situations: (a) acquisition of a ball from a peer, (b) response to provocation by a peer, (c) initiation of play with two peers, and (d) expression of empathy in response to a peer’s distress. Each social dilemma was enacted by the experimenter with puppets and props. Children were given the opportunity to respond through both verbal and nonverbal means. Two stages were used to elicit children’s strategies. First, the experimenter prompted: “What could [child’s puppet] say or do?” Second, following the child’s initial response, the experimenter reenacted the original scenario and altered the prompt: “What is the *niciest* thing that [child’s puppet] could say or do?” This second prompt, which required greater reflection by the child, was designed to assess the availability of socially competent strategies in children’s behavioral repertoires. Additional prompts for socially competent (i.e., “nicest”) strategies were provided until either the response met criteria for a prosocial strategy or the child had been prompted a total of five times.³

Coding. Videotaped responses were coded in two stages. Three trained research assistants, blind to symptom status, independently selected codeable units of verbal and nonverbal behavior. Interrater reliability coefficients for this unitizing process, representing proportions of overall agreement, were .76 for agreement among all three coders and .99 for agreement between any combination of two coders. When all three coders did not agree, a consensus by two of three coders was used to determine whether a given response was designated as a strategy.

Next, two other research assistants assigned each strategy to one of four categories: (1) *prosocial*, including prosocial-interactive strategies (for example, "Can I play with you?") and prosocial-appropriate strategies (for example, "Can I play with the ball?"); (2) *aggressive*, including verbally, physically, and verbally/physically aggressive strategies (for example, child's puppet grabs ball or yells at peer); (3) *nonassertive* (for example, child's puppet stands and watches); and (4) *self-focused* (for example, "I want the ball"). Discrepancies were resolved according to the judgment of an expert coder. The 3% of responses that did not fit into these categories were dropped from analyses.

Occurrence-only agreement for assignment to the four categories was calculated as the number of times the two coders agreed on the placement of a strategy into a category divided by the number of times they agreed plus the number of times they disagreed. Distribution of strategies across the four categories and individual category kappas were, respectively, as follows: 45% and .90 (*prosocial*); 21% and .92 (*aggressive*); 17% and .79 (*nonassertive*); 14% and .69. (*self-focused*).

RESULTS

Data Reduction

Scores for each of the four coding categories (prosocial, aggressive, nonassertive, self-focused) were calculated as a proportion of the total number of alternatives offered by the child across all prompts and all vignettes. Because of the potential skewness in the distribution of proportion scores, analyses were conducted on both raw and arcsin-transformed scores. The pattern of results remained almost identical; thus, only the nontransformed scores are presented.

Additional scores were calculated for the number of prosocial strategies generated at each prompt (*Prompt 1*: "What could [child's puppet] say or do?"; *Prompts 2–5*: "What is the *niciest* thing that [child's puppet] could say or do?"). For each of the five prompts, children received a score representing the number of prosocial strategies produced across all four vignettes (range = 0–4).⁴

Effect of Prompting and Group Status

Our first objective was to assess changes in problem-solving strategies across prompts. Figure 1 displays the mean number of prosocial strategies generated across the four vignettes at each prompt. The pattern of responses reveals that children in both the nonsymptomatic and externalizing groups provided increasingly more prosocial strategies across prompts,

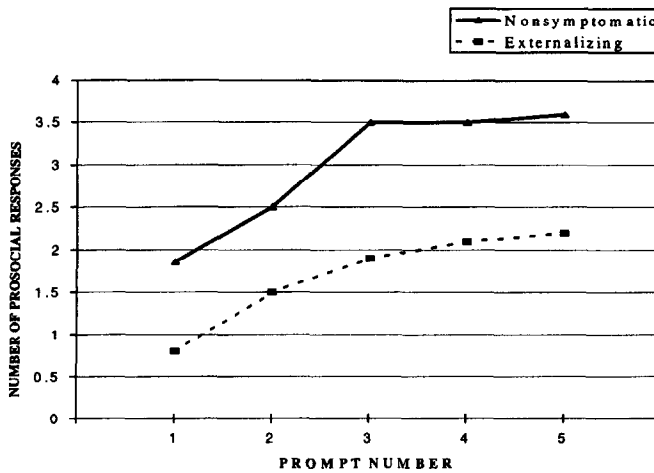


FIG 1. Mean number of prosocial strategies generated in response to each prompt by nonsymptomatic and externalizing children. Prompt 1 is a nondirective prompt: “What could [child’s puppet] say or do?” Prompts 2-5 are directive prompts: “What is the nicest thing [child’s puppet] could say or do?”

but the overall level of competence was notably different. To test for improvement from the first to last prompt, a 2 x 2 (Prompt Number x Symptom Group) mixed-model analysis of variance (ANOVA) was conducted, with prompt number (initial vs. final) acting as a within-participants factor and symptom group (nonsymptomatic vs. externalizing) acting as a between-participants factor. In support of our first hypothesis, a significant main effect for prompt number, $F(1, 30) = 67.15, p < .0001$, indicated that children produced significantly more prosocial strategies by the final prompt ($M = 3.13, SD = 1.13$) than in response to the initial prompt ($M = 1.53, SD = 1.16$). In support of our second hypothesis, a significant main effect of group, $F(1, 30) = 12.83, p < .005$, indicated that the nonsymptomatic children produced a greater number of prosocial strategies ($M = 2.70, SD = .90$) than did the externalizing children ($M = 1.50, SD = 1.16$). Specifically, nonsymptomatic children produced a significantly greater number of prosocial strategies at the initial prompt ($M = 1.86, SD = 1.13$) than did the externalizing group ($M = .80, SD = .92$), $t(30) = 2.61, p < .05$. Likewise, nonsymptomatic children continued to produce a significantly greater number of prosocial strategies by the final prompt ($M = 3.55, SD = .67$) than did the externalizing group ($M = 2.20, SD = 1.40$), $t(30) = 2.89, p < .05$. The interaction between prompt number and symptom group was nonsignificant.

Association Between Problem Solving and Sociobehavioral Adjustment

Next we examined the association between children’s specific problem-solving strategies and teacher ratings of sociobehavioral adjustment. These analyses were based on the overall proportions of each type of strategy, averaged across all prompts and vignettes. As displayed

TABLE 1
Correlations Between Problem-Solving Indexes and Teacher Ratings of Sociobehavioral Adjustment

	Externalizing CBCL (n = 32)	Prosocial Behavior (n = 29)	Aversive Behavior (n = 29)
Prosocial	-.43**	.49***	-.39*
Aggressive	.41*	-.54***	.34*
Nonassertive	.07	-.12	.16
Self-focused	.10	.02	-.02

Notes: *Prosocial* = proportion of total responses scored as prosocial; *Aggressive* = proportion of total responses scored as aggressive; *Nonassertive* = proportion of total responses scored as nonassertive; *Self-focused* = proportion of total responses scored as self-focused. Significance levels are based on one-tailed tests.

* $p < .05$. ** $p < .01$. *** $p < .005$.

in Table 1, externalizing CBCL scores were significantly negatively correlated with the proportion of prosocial strategies produced and were significantly positively correlated with the proportion of aggressive strategies, but were unrelated to nonassertive and self-focused strategies. Likewise, teacher ratings of prosocial and aversive behavior were correlated in the expected direction with overall proportions of prosocial and aggressive strategies, but were not associated with nonassertive or self-focused strategies. To investigate whether nonassertive or self-focused strategies might be associated with other sociobehavioral difficulties, we also examined the relation between proportion scores and the internalizing syndrome on the CBCL. A significant positive association was found between internalizing behavior and self-focused problem solving, $r(30) = .32, p < .05$, and a marginally significant negative association was found between internalizing behavior and aggressive problem solving, $r(30) = -.29, p = .05$.

DISCUSSION

Results from this study underscore the need for refinement in the study of interpersonal problem solving. Researchers have suggested that problem-solving assessments must distinguish between the spontaneous access/production of responses and the strategies available in children's behavioral repertoires (Crick & Dodge, 1994). In line with this view, preschoolers provided a greater number of prosocial strategies in response to directive prompts for appropriate social behavior than in response to nondirective prompts, confirming that the availability of socially competent strategies does not ensure their immediate recall or enactment.

Following the same trend as a nonsymptomatic group of preschoolers, youngsters with externalizing problems also improved across prompts. However, the externalizing group remained at a lower level of problem-solving competence than the nonsymptomatic group

even after a series of probes. These results parallel prior findings in adolescents: Freedman et al. (1978) reported that, despite the increased problem-solving competence displayed when task instructions elicited "best" responses rather than typical responses, a delinquent group performed less competently than a nondelinquent group regardless of task instructions.

Such findings are consistent with two interpretations. On the one hand, children with externalizing behavior problems may manifest deficits in the actual availability of socially appropriate strategies, such that they are less able to generate prosocial responses regardless of the number or type of prompts they receive. On the other hand, this group may be more susceptible to the persistent influence of affective and motivational mediators (e.g., impulsivity, anger, high self-efficacy for aggression). Delineating the precise mechanisms underlying impaired problem solving in children with externalizing behavior problems is an important topic for future exploration.

One explanation for the observed improvement across prompts would mesh with the hypothesized distinction between automatic and reflective responses. That is, due to their lower levels of impulse control, preschoolers, especially those with externalizing behavior problems, may possess additional knowledge that does not emerge during spontaneous behavioral enactment. An alternative explanation for the improvement may be that children inevitably offer a wider range of strategies, some of which are prosocial, when provided with additional opportunities. However, previous research belies the feasibility of this explanation. In two other studies that directly examined the sequence of solutions in children's response hierarchies, researchers found that the performance of aggressive children actually may *deteriorate* with progressive prompts (Evans & Short, 1991; Richard & Dodge, 1982). This discrepancy suggests that a key discriminating factor may be the *type* of additional prompt provided (i.e., prompts for customary vs. socially competent behavior), rather than merely the number of prompts.

We also found that the content of children's strategies accurately predicted teacher ratings of sociobehavioral adjustment. Children who generated more aggressive strategies received higher ratings of externalizing problems and aversive social behavior and lower ratings of prosocial behavior, whereas the opposite was true of prosocial strategies. Not surprisingly, the particular deficits of externalizing preschoolers may be linked to elevated levels of impulsivity or aggression, whereas passive and self-involved behavior may characterize other populations of maladjusted children. Preliminary support for this pattern was provided by the significant association between internalizing CBCL scores and self-focused strategies. Further inquiry into the specific nature of problem-solving deficits associated with varying symptom profiles is needed.

Although these findings shed some additional light on interpersonal problem solving in preschoolers, several limitations should be noted. As discussed earlier, social information-processing models depict a sequence of steps comprising the problem-solving process, including response access and construction, evaluation, selection, and enactment (Crick & Dodge, 1994). This study provides data about one stage of this intricate process, by distinguishing between the spontaneous production of behavioral responses and the avail-

ability of alternative social strategies under more reflective conditions. More fine-grained assessments are required to appraise each discrete phase of this process.

Furthermore, this study did not identify the mechanisms underlying children's improvement from initial to later responses. Results are in line with hypotheses concerning the influence of mediators such as negative affect and impulsivity on initial strategy production. That is, the effect of intervening variables may diminish with multiple prompts that elicit a higher level of reflection. However, more specific examination of mediators may provide vital information as to which precise factors facilitate or impede children's ability and/or motivation to translate their social knowledge into action. For example, researchers have found that in certain social situations aggressive children endorse more hostile and fewer relationship-enhancing goals and demonstrate higher self-efficacy for hostile goals than do nonaggressive children (Erdley & Asher, in press). Social goals and self-efficacy cognitions may, therefore, supercede actual social skills in the determination of behavioral responses. It is feasible that the experimental manipulation in the present study, namely prompting for prosocial behavior, improved problem-solving performance by redirecting children's social goals. Future research may benefit from the direct assessment of possible mediators of behavior.

Finally, replication with a clinical population would be necessary before conclusions can be drawn about more severely disturbed preschoolers. However, this community sample may in fact be quite representative of a significant number of troubled preschoolers whose parents and teachers are beginning to notice problems.

Despite these qualifications, the construct of social problem solving clearly warrants further refinement in both conceptualization and operationalization. Conceptually, problem-solving research would benefit from approaches that are guided by a comprehensive theoretical framework. For example, Dodge's (1986) information-processing model of social interaction describes the overarching social-cognitive and interpersonal context in which problem solving is embedded. Relatedly, script theory (Nelson, 1981) can be applied to understand the specific steps involved during the problem-solving phase. A script has been described as "a cognitive representation of a familiar experience that is called into play to guide behavior given an appropriate verbal or situational context" (Mize & Ladd, 1988, p. 782). Scripts may act as the medium through which knowledge about socially competent strategies is converted into behavior, and it may be at this juncture that some socially maladjusted children experience difficulties. The explicit identification of obstacles at this stage in the problem-solving process should be on the agenda for future research. Methodologically, the manner in which responses are elicited during problem-solving assessments may determine the type of script that is called into action—for example, a script for "customary" behavior versus a script for "socially competent" behavior. Clarifying the type of skill being tapped will foster more accurate interpretation of empirical studies.

The theoretical and empirical issues addressed in this study also have ramifications for intervention efforts. On a positive note, results suggest that some socially maladjusted children may possess *underutilized* social knowledge. The difficulty facing this group of children may lie in their retrieval or execution of prosocial problem-solving strategies. Thus,

the success of therapeutic programs may hinge on their ability to promote the consistent use of available skills, taking into account potential affective or motivational obstacles. Because effecting change in the problem-solving process may be undermined by children's performance of habitualized and engrained behavior patterns, "rewriting" social scripts may require active involvement and practice within *in vivo* situations, during which children are directly coached in the application of their knowledge.

NOTES

1. For further detail about the recruitment process and sample characteristics see Hinshaw, Han, Erhardt, and Huber-Dressler (1992).

2. Although norms are not available for the preschool version of the TRF, previous research with this sample (Hinshaw et al., 1992) suggested that teacher ratings may be more valid than those of parents for predicting externalizing behavior. As a validity check, we calculated parallel scores for each child on the Preschool Behavior Questionnaire (PBQ; Behar, 1977; Behar & Stringfield, 1974). This teacher rating scale consists of 30 items, scored on a 3-point continuum, and has been validated on preschool children. Children's scores on the two externalizing factors—for example, hostile-aggressive and hyperactive-distractible—were summed to yield an overall externalizing score. These scores were highly correlated with those on the externalizing dimension of the CBCL, $r(29) = .85, p < .0001$.

3. The testers used the same criteria as the coders to judge competence. Reliability of the testers' judgments of competence was not separately assessed, but the high reliability coefficient for the Prosocial category suggested that these judgments could be made very reliably.

4. We first examined the relations between the social problem-solving indexes and demographic characteristics. Chronological age (CA) was significantly correlated with the production of prosocial strategies in response to the initial prompt, $r(30) = .49, p < .005$, and with the overall proportion of prosocial strategies, $r(30) = .37, p < .05$. CA was not associated with the number of prosocial strategies generated in response to the second, third, fourth, or final prompts, or with the overall proportion of aggressive, nonassertive, or self-focused strategies. Because externalizing and nonsymptomatic groups did not differ in CA, age was not used as a covariate in subsequent analyses. None of the correlations with gender, cognitive functioning, or expressive language was significant.

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