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Emotion Discourse, Social Cognition, and Social Skills in Children with and without Developmental Delays

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Abstract

This study examined parent-child emotion discourse, children's independent social information processing, and social skills outcomes in 146 families of 8-year-olds with and without developmental delays. Children's emergent social-cognitive understanding (internal state understanding, perspective taking, and causal reasoning/problem solving) was coded in the context of parent-child conversations about emotion, and children were interviewed separately to assess social problem solving. Mothers, fathers, and teachers reported on children's social skills. The proposed strengths-based model partially accounted for social skills differences between typically developing children and children with delays. A multigroup analysis of the model linking emotion discourse to social skills through children's prosocial problem solving suggested that processes operated similarly across the two groups. Implications for ecologically focused prevention and intervention are discussed.

Introduction

The emergence of social competence and the establishment of successful interpersonal relationships are among the most important aspects of child development. Evidence that early experiences provide a foundation for subsequent functioning has prompted efforts to understand mechanisms underlying social adjustment and the emergence of psychopathology (Cicchetti & Cohen, 1995). A particular emphasis has been placed upon social-cognitive processes, including skills related to emotion understanding, perspective taking, and social problem solving. The current study examined similarities and differences in dynamics related to the emergence of social cognition and competence in children with and without developmental delays.

Studies have linked children's emotion knowledge, affective perspective taking, and understanding of mental states to specific aspects of prosocial behavior (e.g., sharing, cooperation, and prosocial responses to others' emotions—Dehnam, 1986; Dunn & Cutting, 1999; Iannotti, 1985) as well as global dimensions of social competence and peer acceptance (e.g., Denham et al., 2003; Garner, 1996; Watson, Nixon, Wilson, & Capage, 1999). Longitudinal studies provide support for a directional relationship, with more advanced social-cognitive skills predicting later adaptive outcomes (Denham et al., 2003; Jenkins & Astington, 2000; Mostow, Izard, Fine, & Trentacosta, 2002). The significance of individual differences in social cognition is underscored by the relative stability of skill disparities (Brown & Dunn, 1996; Hughes & Dunn, 1998) and by striking associations between social-

cognitive deficits and children's externalizing behaviors and problems with peers (Cook, Greenberg, & Kusche, 1994; Deković & Gerris, 1994; Denham et al., 2002).

Investigations of children's social cognition have increasingly turned to social information processing models as frameworks for understanding on-line processing thought to underlie behavioral responses during social interaction. Utilizing Crick and Dodge's reformulated model (Crick & Dodge, 1994), particular attention has been devoted to the study of early steps involving cue encoding and interpretation, and to the later step of response generation. This line of research has predominantly adopted a deficit perspective, highlighting the role of hostile attributions of intent and limited or aggressive social problem solving in the emergence of children's aggressive behavior and poor peer status from preschool age through adolescence (Crick & Dodge, 1994; Dodge & Coie, 1987; Lochman & Dodge, 1994). Intervention programs demonstrate the rewards of improving children's social information processing (e.g., CPPRG, 2002), but comparatively few studies document the benefits of *adaptive* processing directly (see Dodge, Pettit, McClaskey, & Brown, 1986).

Although major strides have been made in conceptualizing the role of social cognition in predicting children's psychosocial outcomes, less is known about the *development* of these skills, particularly in middle childhood. Theories of social information processing posit that children enter situations with a preexisting database of social knowledge that influences the way in which specific social-cognitive processes are enacted (Crick & Dodge, 1994; Lemerise & Arsenio, 2000). While children can acquire this social knowledge (e.g., beliefs about normative aggression) through a variety of accumulated experiences, Dodge (2006) recently proposed that parent-child socialization practices are fundamental to children's acquisition of adaptive social cognition.

The idea that social cognition is constructed through social interaction embraces a transactional view of development and builds upon Vygotsky's early theories (Carpendale & Lewis, 2004; Symons, 2004; Vygotsky, 1978). Central to this approach is the notion that mental processes can be shared and that parents can facilitate development by scaffolding children's emergent skills through sensitive guidance and collaboration. The dynamic, reciprocal quality of parent-child interaction in turn provides a mechanism for internalization. Because the influence of the socializing environment remains even after children develop independent skills (Fernyhough, 1997), individual differences in social cognition may stem, in part, from variations in the interpersonal contexts and environmental experiences that shape children's core database of social-emotional knowledge.

Emotion discourse is a particularly powerful means of communicating information about attitudes, display rules, and socioemotional expectations (e.g., Eisenberg, Cumberland, & Spinrad, 1998), and research has demonstrated important associations between parent-child conversations about emotion and children's independent social cognition. The frequency and complexity of parent-child discussions of emotion during the preschool period have been linked to young children's own emotion talk, understanding of mental states, and perspective taking skills (Dunn, Bretherton, & Munn, 1987; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Jenkins, Turrell, Kogushi, Lollis, & Ross, 2003). Causal explanations of emotion have emerged as particularly important features of discourse, influencing children's ability to label emotional expressions, understand mixed emotions, and engage in affective perspective taking (e.g., Brown & Dunn, 1996; Denham, Zoller, & Couchoud, 1994; Dunn, Brown, & Beardsall, 1991). Eisenberg and colleagues have provided some evidence that associations between parent-child discourse and children's social-cognitive skills persist in middle childhood (Eisenberg et al., 1992). However, important developments in understanding of the mind, emotion, and the self occur during this period (Denham & Kochanoff, 2002; Harris, 1995; Harter, 1999; Lalonde & Chandler,

2002), which make middle childhood a particularly important time to study the nature and implications of parent-child emotion discourse.

While much remains to be learned about environmental influences on the development of social cognition in typically developing children, especially during middle childhood, even less is known about such processes in children vulnerable to maladaptive functioning due to developmental risk. Children with developmental (cognitive) delays experience heightened vulnerability across multiple domains, including significant social problems characterized by maladaptive patterns of peer interaction and persistent difficulties establishing reciprocal friendships (Guralnick, Hammond, Connor, & Neville, 2006; Guralnick, Neville, Hammond, & Connor, 2007b). Such findings are highly concerning given the importance of early peer experiences and close friendships to children's later adjustment and prosocial development (Hartup, 1996; Parker & Asher, 1987).

The interpersonal difficulties of children with delays are not solely a function of developmental level, but rather appear to be associated with social-cognitive challenges and specific problems in social behavior (see Guralnick, 1999 and Leffert & Siperstein 2002 for reviews). Children with developmental delays display the types of social-cognitive deficits demonstrated by typically developing children with poor psychosocial adjustment, including difficulties in perspective taking and emotion understanding, as well as cue recognition and interpretation (Benson, Abbeduto, Short, Bibler-Nuccio, & Maas, 1993; Gomez & Hazeldine, 1996; Kasari & Bauminger, 1998; Leffert & Siperstein, 1996; Leffert, Siperstein, & Millikan, 2000; Yirmiya, Erel, Shaked, & Solomonica-Levi, 1998). Limitations in the social problem solving of children with cognitive delays are also well documented. Relative to typically developing children, children with delays often have greater difficulty generating novel strategies in response to hypothetical scenarios and adapting those strategies to changing contextual demands (Herman & Shantz, 1983; Leffert et al., 2000; Smith, 1986). In many situations, children with delays also produce an increased number of aggressive and appeal-to-authority strategies, and fewer competent solutions (Gomez & Hazeldine, 1996; Jacobs, Turner, Faust, & Stewart, 2002; Leffert et al., 2000). Whereas generation of multiple adaptive strategies has been linked to positive classroom adjustment for children with delays, production of aggressive strategies has been associated with elevated externalizing behavior problems (Leffert & Siperstein, 1996; Healey & Masterpasqua, 1992; Van Nieuwenhuijzen et al, 2006). Observational studies of this population provide corroborating evidence of disruptive and ineffective group entry strategies, and poor conflict resolution skills (Guralnick et al., 1998; Kopp, Baker, & Brown, 1992; Wilson, 1999).

Despite evidence of important links between social cognition and socioemotional functioning in children with delays, little attention has been devoted to possible determinants of social cognition in this population. While internal factors such as executive functioning likely play a role (Carlson, Moses, & Claxton, 2004), the importance of the family environment can be amplified in the context of developmental risk (Crnic & Greenberg, 1987), and parental scaffolding may take on particular significance (J. Baker, Fenning, Crnic, Baker & Blacher, 2007). Furthermore, because children with delays experience a lengthened period of caregiving dependency (REF—Floyd, Costigan….) and restricted peer socialization experiences (Guralnick, 1997), parent-child interactions are likely to remain a primary vehicle for promoting social-cognitive development well into middle childhood.

Given the potentially heightened importance of emotion discourse to social cognition in families of children with delays, it is striking that one of the few studies to examine parent-child conversations in this population revealed restricted emotional content. Tingley, Gleason, and Hooshyar (1994) found mothers of children with Down syndrome to use

significantly less internal state language with their children than did mothers of typically developing preschoolers. In turn, children with Down syndrome are known to make fewer spontaneous references to internal state themselves (Beeghly & Cicchetti, 1997). Factors that compromise discussion opportunities for children with delays may reveal important vulnerabilities. A number of studies have documented increased asynchrony, less positive reciprocity, and more intrusiveness in the overall quality of parent-child interaction in families of children with delays (Crnic et al., 1983; Fenning, Baker, Baker, & Crnic, 2007; Floyd & Phillippe, 1993). Although it has been suggested that elevated parental control may represent a reasonable and appropriate adaptation to children's developmental needs (Marfo, 1990), highly directive parent-child interactions may not be conducive to optimal social-emotional adaptation over time (Ganiban, Barnett, & Cicchetti, 2000), particularly given parallels between parent-child interactions and children's exchanges with peers (Guralnick, Neville, Hammond, & Connor, 2007a). Compounding this issue is evidence that parents of children with delays place greater emphasis on teaching skills in non-social domains and perceive less responsibility for socializing social development than do parents of typically developing children (Kopp et al., 1992). Taken together these findings suggest that children with delays may be exposed to fewer naturalistic parent-child interactions of the type likely to promote social-cognitive development, which further highlights the need to understand the family's role in fostering social competence in this high-risk population.

Current Study

Evidence of family influences on the emergence of children's social cognition is almost exclusively derived from studies of typically developing populations conducted during the preschool years. As such, relatively little is known about these processes during middle childhood, and even less is understood about the development of social-cognitive skills in children with developmental delays. The present study sought to address these issues by utilizing a multi-method, multi-informant approach to evaluate dynamics linking parent-child emotion discourse to children's independent social information processing and social skills outcomes in families of children with and without developmental risk.

Previous research on associations between emotion discourse and social cognition have predominantly employed frequency counts of specific aspects of parent-child discussion (e.g., internal state language, causal explanations—Dunn et al., 1991). The present study instead adopted a holistic approach to represent both the frequency and the complexity of social-cognitive themes in parent-child conversation. By focusing upon the dyadic quality of the interaction, it was possible to address opportunities for discourse relevant to social cognition as well as children's demonstrated capacity in the context of parental scaffolding. It is proposed that this method of observational coding enhances the ability to capture parent-child *co-construction* of shared meaning, and thus the collaborative transactions thought to drive the development of children's social-cognitive understanding (e.g., Vygotsky, 1978).

Parent-child discussion of emotion was conceptualized as facilitating children's internalization of social cognition both indirectly, by fostering complexity in the general database of social-emotional knowledge, and directly by augmenting children's independent abilities in the core domains of internal state understanding, perspective taking, and causal reasoning/problem solving. By examining associations between social cognition evidenced in the context of collaborative parent-child discourse and children's autonomous social-cognitive abilities, the current investigation integrated evaluation of global constructs in relation to specific aspects of on-line processing. Toward that end, an emphasis was placed on children's ability to generate adaptive social problems solving strategies, a component of on-line social cognition robustly associated with social adjustment in typically developing populations.

The present study evaluated these processes during middle childhood, a time that remains relatively understudied from the perspective of environmental influence, but represents an important period of advancement in social-cognitive capabilities likely to facilitate participation in sophisticated emotion discourse (e.g., advances in interpretive theory of mind, improved understanding of mixed emotions, self-conscious emotions, and knowledge of display rules—Denham & Kochanoff, 2002; Gnepp & Hess, 1986; Hala & Carpendale, 1997; Harris, 1995; Harter, 1999; Lalonde & Chandler, 2002; Pons, Lawson, Harris, & de Rosnay, 2003; Saarni, 1999; Saarni, Mummer, & Campos, 1998). Age eight was selected as the focus because many of these complex social-cognitive skills are emergent by this point and such timing allowed for adequate comprehension of the social-cognitive measures by our sample of children with cognitive delays, an issue revisited subsequently in greater detail.

Significant research has been devoted to understanding social-cognitive challenges that may underlie poor psychosocial adjustment. Consistent with this approach, the current study examined developmental status group differences in social cognition, with the expectation that typically developing children would display more sophisticated parent-child emotion discourse, better quality social problem solving, and more adaptive social skill outcomes than children with developmental delays. Furthermore, social-cognitive factors (emotion discourse and prosocial problem solving) were anticipated to account in part for group differences in social skills.

Despite the emphasis on deficit models in developmental psychopathology research, identifying similarities in pathways to competence is also fundamental to understanding risk and resilience. Drawing upon evidence of associations between parent-child emotion discourse and children's early social-cognitive skills (e.g., Dunn et al., 1991; Denham et al., 1994), and findings suggestive of important relations between adaptive social information processing and positive outcomes (e.g., Dodge et al., 1986), a central aim of the present investigation was to evaluate a strengths-based model linking parent-child emotion discourse to children's adaptive social skills outcomes via children's independent ability to generate prosocial problem solving strategies. This model was expected to fit for the entire sample, and for both developmental status groups. It was anticipated that processes underlying the development of social skills in typically developing children and in children with developmental delays would be similar (i.e., process-level differences were not expected to emerge between groups). Ultimately, by improving understanding of core ecological mechanisms contributing to resiliency, the current study sought to inform prevention and intervention efforts for children with a range of developmental levels.

Method

Participants

The current sample was drawn from a multi-site longitudinal investigation of the development of psychopathology and the emergence social competence in children with and without developmental delays from age 3 to 9 years (MASKED). Exclusionary criteria included autism and the presence of severe motor difficulties; typically developing children were also excluded due to premature birth or a history of delays. Families were recruited from community agencies serving children with delays and from normative preschools. Three quarters of the families resided in southern California and one quarter lived in central Pennsylvania.

Participants in the present study included 146 families involved in data collection at child age 8 (85 boys, 61 girls). The participating families represented relatively diverse racial and ethnic backgrounds, with 62% of mothers identifying their children as Caucasian, 14% as

Hispanic, 8% as African American, 1% as Asian, and 15% as "Mixed/Other." Based upon the total IQ score from the age 5 Stanford-Binet IV assessment (SB-IV; Thorndike, Hagen, & Sattler, 1986), 107 children were classified as typically developing (SB-IV > 84, M = 103.7, SD = 12) and 39 children were identified as demonstrating predominantly mild developmental delays (SB-IV ≤ 75, M = 62.7, SD = 11.4).

Families of typically developing children had a higher annual family income (M = $50,001–70,000) and greater maternal education (grade level completed: M = 15.9, SD = 2.5) than did families of children with developmental delays (income M = $25,001–35,000, $t(143) = 4.30$, $p<.001$; education M = 14.6, SD = 2.3, $t(143) = 2.76$, $p<.01$). Once family income was controlled, status groups no longer differed in maternal education. Family income was entered as a covariate in all analyses when it was also associated with the dependent variable of interest.

Procedures

Trained assessors administered the SB-IV to children at age 5 to evaluate intellectual functioning and provide a basis for status groupings. Following the child's 8th birthday, a home visit was scheduled and questionnaire packets were mailed to parents in advance. The structure of the emotion discourse task was adapted from a similar method used to evaluate parent-child discussion of emotion (e.g., Fivush, Brotman, Buckner, & Goodman, 2000). Building upon evidence that conversations about past events, particularly negative emotions, may be especially conducive to children's emotional development (e.g., Lagattuta & Wellman, 2002), parents were instructed to think about a recent time their child was "upset." Parents were asked to generate discussion topics independently, and the emotion discourse task was conducted separately for each dyad. Father-child dyads participated first, followed by mother-child dyads. Each pair was allotted 3 minutes for the discussion, although parents could end the task early, thereby approximating naturalistic interaction. After the conclusion of the emotion discourse task, the child was relocated separately to another area for administration of the *Social Problem Solving Measure*.

Measures

***Stanford-Binet IV* (SB-IV; Thorndike et al., 1986)—**Children's general cognitive ability was evaluated with the SB-IV. The SB-IV composite score yields a mean of 100 and a standard deviation of 16. The SB-IV has sound psychometric properties and is well suited for evaluation of children with delays because the starting point is tailored to a child's developmental level.

Emergent Social Cognition Observation System (ESCOS)—The parent-child emotion discourse interactions were coded using the *ESCOS*, developed by the first author for this study. Coding evaluated the extent to which the parent-child interaction provided opportunities for discussion relevant to social-cognitive development and, within those contexts, the degree to which the discourse fostered complexity in children's social cognition in three core domains: internal state understanding, perspective taking, and causal reasoning/problem solving. *Internal State Understanding* refers to awareness of and ability to interpret one's own mental and feeling states. Internal state understanding may be observed in references to discrete emotions, thoughts or desires, or to the act of thinking, feeling, knowing, wishing, or imagining. References to physiological states (e.g., cold, hunger) and states of consciousness (e.g., sleepy, awake) are excluded from consideration. *Perspective Taking* refers to attempts to identify, understand, and make inferences about another's emotions, point of view, or situation. Perspective taking is defined as a general construct that encompasses three main subtypes: 1) affective perspective taking, 2) cognitive perspective taking, and 3) spatial perspective taking. *Causal Reasoning/Problem Solving* is

defined by references to and explanations of causality as well as attempts to problem solve. Problem solving skills are viewed as existing on a continuum, with causal reasoning functioning as the first, most elementary component. More advanced problem solving may be characterized by one or more of the following: 1) problem identification, 2) generation of response strategies, 3) evaluation of strategies, 4) selection and discussion of a solution, and 5) planning for future behavior.

Each of the three domains was rated on a five-point likert scale that balanced consideration of the frequency of skills demonstrated by the dyad during the discourse with the complexity of the observed skills. Complexity was defined as the sophistication attained by the child in the context of parental scaffolding, and was weighed more heavily than frequency. Thus, discourse characterized by frequent, but low-level skills initiated by parent and child (e.g., basic emotion labeling) received a score of 3 whereas discussions involving highly complex social-cognitive reasoning defined by significant independent child contributions received the highest score of 5 (e.g., spontaneous exploration of mixed emotions and guided discussion of implications for future internal states). A score of 1 was assigned to dyads that did not demonstrate relevant reciprocal discussion and a score of 2 was reserved for dyads in which discussion of relevant social-cognitive material occurred, but the child remained only passively engaged. Interactions were therefore scored on a continuum, with lower scores indicating no to little child involvement, mid-level scores reflecting the child's receptive understanding of parental guidance and independent demonstration of basic skills, and high scores representing substantial autonomous child contributions in the context of sophisticated parent-child discourse. In order to capture important nonverbal communications and contextual cues (e.g., evidence of active listening, as demonstrated by the child's eye contact, nodding, and other forms of subtle responsiveness), the task was coded directly from videotape rather than from a transcript of the discussion.

Four undergraduates, blind to the hypotheses of the current study, coded over 600 hours of the discourse interactions in teams of two. After watching the videotape, each coder independently rated the interaction. Partners then discussed coding discrepancies and reviewed the videotape as needed to reach a consensus. Each team rated more than half of the videotapes to allow for relatively equivalent distribution of coding and thirty percent overlap with the master coder. Reliability with the master coder, the first author of this study, was calculated using intraclass correlation coefficients. Acceptable levels of reliability were obtained for all scales. Reliability for father-child and mother-child discourse was as follows: .88/.76 for internal state understanding, .88/.86 for perspective taking, and .75/.85 for causal reasoning/problem solving.

Social Problem Solving Measure (SPSM; CPPRG, 1991)—The SPSM is a widely used interview measure designed to assess children's ability to access and generate problem-solving strategies in response to challenging social situations. The SPSM contains eight vignettes of scenarios involving either peer entry or resolution of a social conflict. The experimenter reads each vignette to the child while displaying a pictorial representation. Following each story, the child is asked to tell the experimenter what he or she would "say or do" to resolve the situation. The child is prompted for three responses to each scenario.

Early methods of coding the SPSM assigned responses to one of 13 categories prior to forming composites (e.g., Dodge, Pettit, Bates, & Valente, 1995). More recently, responses have been categorized into global dimensions from the outset (Corrigan, 2003). Given the emphasis in this study upon identifying pathways to competence among children who were not selected due to risk for aggression *per se*, coding was modeled after the original, more comprehensive method with slight modification. The final coding system included 15 categories: (0) Physically Aggressive, (1) Verbally Aggressive, (2) Disruptive (3)

Threatening Authority Intervention (4) Seeking Authority Intervention/Punishment, (5) Commanding/Directing/Telling, (6) Simple Asking, (7) Positive Negotiating, (8) Expressing Feelings, (9) Generally Assertive, (10) Non-Specific "Niceness," (11) Passive/Inept, (12) Irrelevant/Other, (13) Repetitive Response, (14) Unable to Provide a Response. If a response fit more than one category, it was assigned to the category with the lowest code number. Examples of responses for each category are presented in the appendix. Scoring for the measure considered the total number of strategies generated in each category for the eight vignettes as well as the total number of novel strategies generated during the task. Reliability was calculated based upon coders' consensus ratings for 20% of the interviews, 1584 cases, using MacKappa software (Watkins, 2002). Overall reliability was very good (κ = .92) and the reliability for each scale was above .70 (range .70 to .98), with the exception of "Irrelevant/Other" (κ = .57).

Research indicates that social-cognitive measures can be used successfully in populations with delays, and that children's responses to hypothetical situations relate to observed behavior (Van Nieuwenhuijzen et al., 2005). Nevertheless, care was taken to ensure the validity of the SPSM data. Staff and graduate students, trained in the assessment of developmental delays, administered the SPSM and assessed comprehension. The first author further reviewed questionable data. To be included in the present sample, children could provide no more than 4 (out of 24) uncodable responses in the context of an otherwise interpretable and valid interview. Four children with complete SPSM interviews were excluded based upon this criterion.

Social Skills Rating System **(SSRS; Gresham & Elliott, 1990)—**The SSRS is a widely used questionnaire measure that has adequate reliability and validity, and provides a broad assessment of social skills, problem behaviors, and academic competence. The present study examined mother, father, and teacher report of social skills on the Elementary-level version of the SSRS. Only the Social Skills Scale score was utilized, which includes evaluation of children's responsibility (parent version only), cooperation, self-control, and assertiveness.

Results

Data Management

Data reduction techniques were employed to reduce the possibility of Type I error. Composite variables were created separately for father-child and mother-child emotion discourse interactions. Scores for internal state understanding, perspective taking, and causal reasoning/problem solving were combined for each dyad. The variables were composited on a theoretical basis, with each variable believed to represent an important component of global social cognition. However, all three discourse variables were also significantly related in the expected direction (*r*'s ranged from .24 to .54 for the father-child discourse, and from .23 to .37 for the mother-child discourse), and loaded onto a single factor for each dyad in a principal components analysis, with all factor loadings over .60. The association between the final father-child and mother-child discourse composites was substantial, r = .52, $p < .001$.

The fine-grained coding completed for the SPSMin the present study permitted analysis of specific strategies traditionally encompassed by broad competent or aggressive dimensions. Within the competent domain, simple asking and positive negotiating (r = .21, $p < .05$) were considered to be the most adaptive types of strategies, and were therefore selected to form the *prosocial strategies* composite. Other strategies generally coded as competent (e.g., commanding/directing/telling, general assertiveness, and non-specific niceness) were not significantly related to simple asking or positive negotiating in the current sample. With

respect to maladaptive strategies, data revealed a meaningful differentiation between strategies involving physical aggression and disruptiveness, which were combined to create an *impulsive-aggressive* strategy composite ($r = .18$, $p < .05$), and strategies involving verbal aggression and threats of authority intervention($r = .28$, $p < .01$), combined to form a *verbally aggressive* composite. Only the prosocial and impulsive-aggressive composites were related ($r = -.28$, $p < .01$).

Utilizing complete data was prioritized for the SPSM, given the importance of ensuring task validity; complete data were also available for the mother-child emotion discourse. A majority of data were complete for the remaining measured variables (ranging from 70% for father-reported social skills to 93% for mother-reported social skills). Given the clear benefits of estimating data over excluding missing cases, for purposes of structural equation modeling, missing data were estimated using full information maximum likelihood (Enders & Bandalos, 2001).

Developmental Status Group Differences

Table 1 presents developmental status group differences. As expected, univariate ANCOVAs revealed that typically developing children engaged in more sophisticated parent-child emotion discourse and generated a greater number of prosocial problem solving strategies than did children with delays. Typically developing children also received higher social-skills ratings from all respondents. Conversely, children with delays produced more maladaptive strategies, with group differences in impulsive-aggressive strategies significant at $p = .05$.

Children with delays did not propose seeking authority figures or other passive strategies more often than did typically developing children. Groups also did not differ in the number of novel or repetitive strategies generated during the task, nor did groups differ in the frequency of non-responses. Children with developmental delays did, however, provide more irrelevant strategies, $F(1, 142) = 27.51$, $p < .001$. Group differences did not emerge in strategies involving directing/telling, expressing emotions, general assertiveness, or non-specific niceness.

Testing a Strengths-Based Model

Structural Equation Modeling (SEM) was used to evaluate the fit of the proposed strengths-based model for the entire sample as well as the hypothesis that children's prosocial strategies would mediate the association between parent-child emotion discourse and children's social skills outcomes. The model presented in Figure 1 was tested with AMOS version 6 (Arbuckle, 2005). Table 2 shows the intercorrelations among variables entered into the model.

Three criteria were employed to evaluate model fit: the chi-square test, the Comparative Fit Index (CFI), and the root mean squared error of approximation (RMSEA). A non-significant chi-square value indicates good model fit, as do CFI values above .90 (range 0 to 1.00) and RMSEA values below .06. Based upon these criteria, the fit of the overall model presented in Figure 1 appeared excellent, $\chi^2(12, N = 146) = 12.3$, ns, CFI = .997, RMSEA = .01.

SEM allows for the simultaneous evaluation of links between measured variables and latent constructs, and of associations between the constructs themselves. All indicator loadings for the latent variables and all path coefficients were statistically significant. The pathways between the covariate, family income, and other model variables were found to be significant only for emotion discourse, $\beta = .32$, $p < .01$, and social skills, $\beta = .31$, $p < .01$. After controlling for these effects, more sophisticated emotion discourse predicted better prosocial problem solving, which was associated with higher social skills ratings (see Figure

1). The total variance in children's social skills accounted for by the strengths-based model was 24%.

It was hypothesized that children's independent prosocial problem solving would mediate the association between parent-child emotion discourse and children's social skills outcomes. Following Holmbeck's (1997) procedure, the direct effect model was evaluated first. Results indicated that emotion discourse did not predict social skills beyond the level of a trend, $\beta = .26$, $p < .10$. These results precluded further evaluation of the mediation hypothesis, suggesting instead the presence of an indirect effect.

Because the social-cognitive data were collected at the same time point, it was important to evaluate the hypothesized directionality by considering an alternative model, wherein parent-child emotion discourse linked prosocial strategies to social skills outcomes. The Akaike Information Criterion (AIC) was used to compare the two non-nested models, with smaller AIC values indicating better model fit. The alternate directionality would be less interpretable on a theoretical basis, and indeed results indicated a poorer fit to the data, as indexed by the AIC (Alt. Model AIC = 66.25, Original Model AIC = 58.32), and general fit statistics, $\chi^2(12, N = 146) = 20.25$, $p < .10$, CFI = .93, RMSEA = .07.

Accounting for Developmental Status Group Differences in Social Skills Outcomes

Given that the strengths-based model fit well for the sample as a whole, the extent to which emotion discourse and prosocial strategies might account for developmental status group differences in social skills outcomes was of particular interest. All measurement parameters previously outlined applied to this analysis. Family income was again entered as a covariate.

According to Holmbeck (1997), a model in which developmental status predicted social skills was evaluated first, and fit the data adequately, $\chi^2(5, N = 146) = 9.0$, ns, CFI = .96, RMSEA = .07. Next, a model that included both the direct and indirect effects was tested. Controlling for family income, the fit of this second model was excellent, $\chi^2(17, N = 146) = 17.1$, ns, CFI = .999, RMSEA = .01. The path coefficients for the indirect effect were significant in the predicted direction, and the direct path from status to social skills remained significant as well.

In the final test, the path coefficient for the direct effect was constrained to zero. The fit of this third model was poor, $\chi^2(18, N = 146) = 45.8$, $p < .001$, CFI = .84, RMSEA = .10. The significant difference between the constrained and unconstrained models, $\Delta\chi^2(1) = -28.7$, $p < 001$, indicates that full mediation did not occur. Although developmental status remained a predictor of children's social skills outcomes, the significance of the indirect pathway suggested partial mediation. Figure 2 presents the final model with both the direct and indirect effects. This model accounted for 43% of the variance in children's social skills.

Multigroup Analysis by Status Group

Thus far, results revealed that children with delays generally displayed more problematic functioning than typically developing children on measures of interest, and that social-cognitive factors partially accounted for status group differences in social skills outcomes. However, the proposed strengths-based model held for the sample as a whole, and it was believed that processes contributing to social skills would operate similarly within each group.

A multigroup analysis was performed to evaluate whether the model presented in Figure 1 fit the data equally well for typically developing children and for children with developmental delays. Given the smaller sample size of children with delays, a path analysis was employed to maximize power for the multigroup analysis. The father-child and mother-

child discourse variables were combined to form a single composite. Teacher report of children's social skills was selected as the outcome of primary interest given the emphasis in the social-cognitive interview on situations likely to be encountered at school. In addition, teacher report represents the most independent measure of children's social functioning, and therefore the most stringent test of the strengths-based model. Family income was not included as a covariate for the multigroup analysis because income was not associated with predictor and outcome variables within each sample.

A baseline model was evaluated in which parameters were allowed to vary for each status group. The resultant model fit was very good, $\chi^2(2, N \text{ TD} = 107, N \text{ DD} = 39) = 2.7$, ns, CFI = .95, RMSEA = .05, indicating that the model held for both groups. Model comparisons were then undertaken to evaluate group differences in the structural pathways by constraining one pathway at a time and reevaluating model fit using the chi-square difference test. Constraining the pathways did not result in a significant decrement in model fit, $\Delta\chi^2(2) = 1.2$, ns. Thus, although path coefficients had higher values for children with delays, the strength of the pathways were not significantly different between groups (constrained model: $\chi^2(4, N \text{ TD} = 107, N \text{ DD} = 39) = 3.9$, ns, CFI = 1.0, RMSEA = .00).

Discussion

The current investigation examined associations between observed parent-child emotion discourse, children's independent social problem solving, and parent and teacher report of children's social skills outcomes. Emphasis was placed upon evaluating a strengths-based model, and determining whether pathways to social competence were similar for typically developing children and children with developmental delays. The present study extended past research with normative samples by focusing on middle childhood and by employing a novel method to evaluate parent-child co-construction of social-cognitive understanding through emotion discourse. Findings provided support for the effectiveness of the *Emergent Social Cognition Observation System*. Adequate internal and inter-rater reliability was established, and evidence for construct validity was demonstrated through expected associations with indicators of child social-cognitive skills. The inclusion of fathers in the present study also enabled the examination of consistency in children's abilities and parental scaffolding across contexts, thereby further contributing to understanding of environmental influence upon children's emerging social-cognitive skills.

Not surprisingly, typically developing children generally displayed more adaptive functioning than did children with delays across domains. However, group differences were not universal. Both groups generated a comparable number of novel problem solving strategies, which suggests a potential strength not previously documented in studies of children with delays (see Leffert & Siperstein, 2002). Yet, typically developing children did produce better quality solutions. Although both strategy content and repertoire size have important implications for child outcomes, strategy quality may be more predictive of actual behavior (Youngstrom, Wolpaw, Schoff, Ackerman & Izard, 2000). This is perhaps especially true for children with delays, who may enact strategies without fully engaging in the response-decision process (Van Nieuwenhuijzen et al., 2006), possibly as a result of difficulty weighing alternative solutions. If the importance of initial strategy quality is indeed heightened for children with delays, these children may be doubly disadvantaged, with difficulties generating prosocial strategies compounded by a tendency to produce a greater number of maladaptive solutions.

Group differences did not emerge in the number of passive or appeal-to-authority strategies children produced, which may suggest that children with delays in the present sample generated more active and direct responses than has usually been observed in prior research.

Inconsistencies between this study and past investigations also may stem from methodological variations. Previous research on children with delays has utilized samples with varying ages, and has often included individuals with specified syndromes (e.g., Down syndrome, autism—see Kasari & Bauminger, 1998 for a review). Although interest in social cognition in children with delays is increasing, further research is needed to replicate and clarify findings.

Research utilizing a social information processing perspective has largely focused upon deficits in social cognition that contribute to poor psychosocial adjustment. Accordingly, much has been learned about the consequences of poor social problem solving (Crick & Dodge, 1994), with less attention devoted to conceptualizing social-cognitive strengths as important protective factors. The current study sought to address this issue by testing a strengths-based model under normative conditions and under conditions of developmental risk. The proposed model fit the data very well for the sample as a whole. Children who engaged in complex emotion discourse with their parents independently produced a greater number of prosocial problem solving strategies, which in turn were associated with more adaptive social skills outcomes. Furthermore, the pathway to social skills outcomes was achieved in a similar manner for all children. Such parallels are noteworthy because research on children with developmental delays often aims to identify and illuminate group differences. However, efforts to elucidate commonalities have great potential to enhance understanding of risk and resilience (Cicchetti & Cohen, 1995). The present findings therefore serve as an important reminder that knowledge of typical development readily applies to investigation and intervention for children with delays, while underscoring the need to explore similarities and differences in developmental process for these groups.

Implications for Intervention

Many social skills interventions for school-aged children focus on the child as the agent of change, with emphasis placed upon improving independent abilities. In this context, behavioral and cognitive-behavioral approaches predominate, and social problem solving has received particular attention, though treatment outcomes have been mixed. Interventions focused on social problem solving have often succeeded in improving problem solving abilities, but effects on children's actual social behavior appear more limited (Denham & Almeida, 1987; Gresham, Sugai, & Horner, 2001). Such findings have prompted researchers to call for further consideration of children's social environment in developing intervention protocols (Gresham et al., 2001). Accordingly, results from the current study highlight the potential to improve prevention and intervention, for typically developing children and children with delays, by centering efforts on family process and on parent-child emotion discourse in particular.

Given that families of children with delays are known to experience heightened stress as well as other potential disruptions in the parent-child relationship (Crnic et al., 1983), attention to family-level processes may be critical to successful intervention efforts with this population. Indeed, programs designed to augment the quality of mother-child interaction have produced positive effects on the long-term adjustment of children at risk for developmental delay (Ramey & Ramey, 1999). However, even comprehensive interventions face problems of generalizibility and often produce only modest results (Guralnick, Connor, Neville, & Hammond, 2006).

Achieving and sustaining gains in social competencies has been particularly problematic for children with delays (Gresham et al., 2001; Guralnick et al., 2006). The combination of limited socialization experiences and concrete processing that characterize many of these children may produce highly situation-specific social knowledge that restricts enactment of effective social information processing across contexts (Leffert & Siperstein, 2002). As

typically developing children mature and draw upon increasingly diversified knowledge structures to inform flexible social behavior, the contrast between developmental status groups in the quality of social-cognitive skills and social outcomes may widen. Typically developing children may also become more adept at integrating emotion and cognition systems over time, leading to stronger associations between social cognition and actual prosocial behavior (e.g., Underwood & Moore, 1982). Consequently, there is reason to suspect that social difficulties experienced by children with developmental delays may become more pronounced comparatively with age, which further underscores the need to enhance current intervention techniques, perhaps through further attention to ecological mechanisms.

In this vein, the present study identified parent-child emotion discourse as an important domain of strength for families of children with delays, and thus a potentially fruitful entry point for prevention and/or intervention efforts. Training studies involving typically developing children point to the causal role of discourse in the emergence of social-cognitive abilities in young children who do not yet display skill mastery (e.g., Lohmann & Tomasello, 2003). Although experimental trials are necessary, the viability of extending these findings to children with delays is bolstered by evidence from the present study that processes linking emotion discourse to children's independent social cognition are similar for children with and without delays. Specifically, programs for children with delays could target elements of discourse known to advance social-cognitive development in typically developing children while couching this training in the type of collaborative parent-child discourse shown in the present study to be associated with children's adaptive, independent, social-cognitive processing. Contextualizing intervention within everyday family interactions may have the added benefit of helping children with delays to generalize social understanding across contexts, a critical task for any intervention program. Furthermore, such an approach could enhance parents' feelings of efficacy, particularly by overtly building upon parents' natural ability to scaffold communication to children's developmental level (J. Baker et al., 2007; Guralnick, Neville, Hammond, & Connor, 2008).

Programs aimed at improving parent-child discourse and children's prosocial problem solving skills may be particularly beneficial for children with delays, given current findings that deficits in these areas partially explained poorer social skills in this population. Nevertheless, within-group variation also revealed that some families and children with delays retained key social-cognitive strengths, which directly related to resilient social skills outcomes. Taken together, these results suggest that parent-child discourse and child prosocial problem solving are core risk mechanisms *and* potentially malleable resiliency factors, characteristics that make these constructs prime candidates for prevention and intervention efforts (Luthar, 2006).

Limitations and Future Directions

The current study revealed associations between data drawn from multiple sources, including observation of family process, child interviews, and parent and teacher reported outcomes. Furthermore, processes outlined by the strengths-based model were found to hold for typically developing children and for children with developmental delays. As such, confidence in the robustness of the significant findings is high. Nevertheless, some limitations exist. First, the investigation employed a moderately sized sample of children with developmental delays. It will be important to replicate results with a larger group. In addition, given the increased cognitive requirement of the social-cognitive interview measure, ensuring the validity of task data for children with delays was a key concern, which led to retention of a sample with predominantly mild delays. Results therefore may not be generalizable to children with more significant impairments. Lastly, data in the present study were collected primarily when children were eight years old, as several

measures were only introduced at that time point. Although analysis of an alternate model provided support for the hypothesized directionality, a longitudinal perspective would enable further evaluation of the direction of effects.

Given that the proposed strengths-based model was supported across groups, a vital next step will be to address resiliency more directly by examining moderating effects, and by evaluating the clinical significance of any protective factors. In addition, it will be critical to examine other child factors that may play a role in this process, particularly with respect to emotion regulation. Previous work with the current sample suggests that this may be an important avenue to pursue, as emotion regulation was found to partially mediate the association between developmental status and social skills at an earlier age (MASKED). Furthermore, given that many social interactions are likely to occur in the context of emotional arousal, regulatory abilities may play an instrumental role in shaping social information processing patterns (Lemerise & Arsenio, 2000). Devoting further attention to risks in the socializing environment would likely prove beneficial as well (e.g., peer networks—Guralnick, 1997), as would considering the larger family context of emotion discourse. Especially intriguing is the role that typically developing siblings may play in the emergence of social cognition in children with developmental delays.

Lastly, utilizing qualitative methods to identify common themes in parent-child emotion discourse could provide insight into the meaningful heterogeneity observed. For example, several children described experiencing multiple emotions of contrasting valence (e.g., “I felt mad and sad at the same time”), which reflects a sophisticated level of internal state understanding that emerges during middle childhood. Many references to perspective taking involved children adopting the viewpoint of their parents and other close family members, providing further support for the premise that family relationships may serve as a training ground for competence with peers. Finally, some children and families tended to truncate the problem-solving process by generating “magical solutions” (i.e., concluding that difficulties would resolve without action). Analyses that fully appreciate the richness of these parent-child exchanges could highlight both normative developmental trends and important variability in the emergence of children’s social cognition.

A developmental psychopathology approach provides a conceptual framework for understanding deviations from expected trajectories as well as similarities between typically developing children and children at risk (Cicchetti & Cohen, 1995; Luthar, 2006). Findings from the present study are consistent with this perspective, and reveal the manifold impact of children’s developmental delay upon core processes contributing to positive adaptation. Ultimately, resilience research aims to identify those processes that take on increased importance in the context of identified risk; findings from the current study suggest that parent-child discourse and children’s prosocial problem solving may prove to be such factors for children with developmental delays.

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Figure 1.
Strengths-Based Model for the Entire Sample
*p<.01, **p<.001

Figure 2.
Partial Mediation of the Association between Developmental Status and Social Skills Outcomes
*p<.05, **p<.001

Table 1

Developmental Status Group Differences

Variable	Typically Developing (*n* = 107)	Developmental Delays (*n* = 39)	Statistic
Emotion Discourse			
Father-Child	.11(.76)	−.42(.60)	$F(1, 110) = 6.58^{*}$
Mother-Child	.13(.72)	−.33(.66)	$F(1, 142) = 8.30^{**}$
Social Problem Solving			
Prosocial	.13(.75)	−.37(.74)	$F(1, 142) = 9.44^{**}$
Impulsive-Aggressive	−.07(.66)	.21(.99)	$t(144) = -1.98^{+}$
Verbally Aggressive	−.06(.66)	.17(1.1)	$t(144) = -1.53$
Socioemotional Outcomes			
Mother SSRS	101.8(16.3)	84.2(15.7)	$F(1, 131) = 24.37^{***}$
Father SSRS	99.8(14.1)	84.7(15.8)	$t(102) = 4.46^{***}$
Teacher SSRS	101.7(11.9)	91.7(12.2)	$F(1, 107) = 7.64^{**}$

Note. The emotion discourse and social problem solving composites were standardized (z-scores) for the entire sample. Family income was controlled in analyses of group differences when income was significantly related to the dependent measure.

$^{+}p = .05$.

$^{*}p < .05$.

$^{**}p < .01$.

$^{***}p < .001$.

Table 2

Intercorrelations among Variables entered in Model Presented in Figure 1

	Father-Child	Mother-Child	Prosocial Strats	Mother SSRS	Father SSRS	Teacher SSRS
1. Father-Child Discourse	--					
2. Mother-Child Discourse	.52***	--				
3. Prosocial Strategies	.36***	.34***	--			
4. Mother SSRS	.18†	.19*	.23**	--		
5. Father SSRS	.17†	.10	.26**	.52***	--	
6. Teacher SSRS	.22 *	.11	.37***	.27**	.40***	
7. Family Income	.23*	.20*	.17+	.23**	.17†	.31**

† $p < .10$,

+ $p = .05$,

* $p < .05$,

** $p < .01$,

*** $p < .001$

Appendix 1

Examples of Social Problem Solving Responses by Category

Vignette:	Pretend that this is you and that this is a boy/girl in your class. He/she is the same age as you, 8 years old. He/she has been on the swing for a long, long time and doesn't seem to want to share the swing with you. You would really like to play on the swing. What could you say or do so that you could play on the swing?
Physically Aggressive:	"When I push him and he comes back, I'll stick my hands out and he'll fall and I'll take the swing." "Just take the swing from her."
Verbally Aggressive:	"Tell him that I wouldn't be his friend anymore." "You're mean."
Disruptive:	"Just interrupt and annoy her"
Threatening to Seek Authority:	"Let me swing on it or I'm going to tell the teacher."
Seeking Authority:	"Tell the teacher to make him give me the swing"
Commanding/Directing/Telling:	"Get off the swing."
Simple Asking:	"Can you please get off?"
Positive Negotiating/Navigating:	"I might share a swing with her, sit on it with her, or tell the principal I think we should build more swings." "Say you've been on the swing for a long time and I think you should let someone else go. It's not fair to the other kids." "You look like a nice girl to play with. Maybe we can take turns."
Expressing Feelings:	"I really like to swing. It'd be fun if I could have a turn." "It makes me sad that I don't get a turn."
Generally Assertive:	"How come I don't get to do it?"
Non-Specific Niceness:	"Be nice and play nicely"
Passive/Inept:	"Just don't say anything and walk away."
Irrelevant/Other:	"Play on the sidewalk together"