

## The Development of Concern for Others in Children With Behavior Problems

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The development of concern for others and externalizing problems were examined in young children with normative, subclinical, or clinical levels of behavior problems. There were no group differences in observable concern for others at 4–5 years of age. Children with clinical behavior problems decreased significantly in their concern by 6–7 years of age and were reported to have less concern at 6–7 years by mothers, teachers, and the children themselves, relative to other groups. Boys with clinical problems were more callous to others' distress at both time points. Girls showed more concern than boys across risk, time, and measures. Greater concern at 4–5 years predicted decreases in the stability and severity of externalizing problems by 6–7 years, and greater concern at 6–7 years predicted decreases in the stability of problems by 9–10 years. Finally, maternal socialization approaches predicted later concerned responding.

Oppositional, aggressive children are characterized by a tendency to act on their negative impulses, often without apparent attention to any effects upon the well-being of others. Deficits in empathy and remorse are recognized as common in children with disruptive behavior disorders (American Psychiatric Association, 1994). Perspective-taking and affective arousal in response to others in distress can promote interpersonal responsibility and inhibit harmful acts (Eisenberg & Mussen, 1989; Feshbach, 1975; Hoffman, 1982). Perhaps owing to the marked stability of externalizing problems over the life span (Mealey, 1995; Olweus, 1979), it has even been suggested that lowered empathy is an inherent part of antisocial individuals (Schacter & Latane, 1964). However, it is not clear when such deficits in concern for others first become evident, or what role deficits play in the development of externalizing behaviors.

In this investigation, we tracked the development of concern for others from preschool age to the early elementary school years in children at varying levels of risk for disruptive behavior disorders. *Concern for others* was used as a broad, inclusive term for the coordinated and correlated behavioral, affective, and cognitive factors associated with empathic and prosocial reactions (see also Grusec, 1991b; Grusec, Goodnow, & Cohen, 1996). We attempted to determine when children with and without externalizing problems begin to manifest reliable differences in their concern for others. We also examined whether the early presence of greater concern for others served as a protective factor against the development or maintenance of disruptive behaviors. Finally, we examined the relations between children's concern for others at 6–7 years of age and their cardiac responses to depictions of sadness and distress and their mothers' socialization approaches at preschool age.

### Development of Empathy and Concern for Others

Humans are thought to have a biological preparedness to attend to and recognize the emotional needs of others (Hoffman, 1975). Empathy functions as a social emotion, effectively bridging the affective states of one individual with another (Levenson & Ruef, 1992). Evolutionary perspectives suggest that this empathic awareness has been adaptive for allowing humans to predict each other's behaviors and, in the case of altruistic, helpful, or cooperative acts, for forging lasting bonds of trust and reciprocity within their social groups (Nesse, 1991; Sober & Wilson, 1998). Studies of twins—both children and adults—have identified heritable, genetic components for empathy and prosocial acts (Matthews, Batson, Horn, & Rosenman, 1981; Rushton, Fulker, Neale, Nias, & Eysenck, 1986; Zahn-Waxler, Robinson, & Emde, 1992; Zahn-Waxler, Schiro, Robinson, Emde, & Schmitz, in press).

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The most commonly found group difference in concern for others is between the sexes. Girls show more concern than do boys from the second year of life through adolescence (Eisenberg & Fabes, 1998; Grusec et al., 1996; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). In addition, individual differences in concerned responses to distress in others are moderately stable over the first 2 decades of life (Cummings, Hollenbeck, Iannotti, Radke-Yarrow, & Zahn-Waxler, 1986; Eisenberg et al., 1987, 1999; Zahn-Waxler et al., in press). Interestingly, there are no published longitudinal observations of children's concern for others over the transition from preschool to the early elementary school years. One might expect both overall increases and moderate individual stability in concern for others over this period.

### Concern for Others in Children With Disruptive Behavior Problems

The lack of concern for others in many antisocial adolescents has been well documented (Chandler & Moran, 1990; Cohen & Strayer, 1996; Ellis, 1982). The few studies done with younger children do not mirror these results. Examinations of the children in the present sample (Zahn-Waxler, Cole, Welsh, & Fox, 1995) and in an independent study (MacQuiddy, Maise, & Hamilton, 1987) have shown that, at preschool age, children with and without disruptive behavior problems do not differ in their concern for others. However, Kochanska (1991) found that more disobedient toddlers were less likely, 6 to 8 years later, to report prosocial responses to vignettes depicting transgressions against others than were less disobedient toddlers. She suggested that early poor behavioral self-regulation, as indexed by disobedience, might predict future problems in conscience development through either biological or environmental pathways. In addition, Zahn-Waxler (1993, 2000) has described social and biological contributors to the widely recognized gender differences in both concern for others and externalizing problems. Compared with boys, girls' greater orientation toward the needs and well-being of others may be involved in their decreased risk for the development of disruptive behavior disorders.

Concurrent negative associations between concern for others and aggressive or disruptive behavior typically become detectable in children in the early elementary school years (Feshbach & Feshbach, 1969; Tremblay, Vitaro, Gagnon, Piche, & Royer, 1992). The inverse relation between concern for others and antisocial behavior may increase with age (Miller & Eisenberg, 1988). Early aggression and externalizing problems in children may therefore be expected to coexist with normal levels of concern for others. The empathic deficits of aggressive individuals emerge over time, either through arrested development of concern at a relatively immature stage or by an actual decrease from earlier levels. In addition, antisocial children may not only lack concern but may also actively disregard or be callous toward others in need. These possibilities suggest not only the need for longitudinal analysis of this issue but also for examination of both constitutional and environmental factors that may be implicated in suboptimal patterns of the development of concern for others.

### Psychophysiology and Concern for Others

Because empathic concern for the well-being of others may be a heritable, biologically based response system, some researchers have attempted to identify physiological components of such responses. Sympathetic activation or parasympathetic inhibition lead to changes in cardiac functioning, which can be interpreted as bodily cues of discomfort or distress and a need for action. Empathy may be associated with such autonomic changes in response to others' experiencing distress, as their needs are attended to, recognized, and to some degree shared. If one is the cause of the distress, this heightened arousal may serve as negative physiological feedback, such that the aggression or harmful acts are not continued or increased (Miller & Eisenberg, 1988). Further, prosocial and reparative behavior may become more likely, because one is cued to the presence of distress in another that could be alleviated. Thus, more empathic children are expected to be more physiologically aroused by distress in others and to display more concern for others.

Antisocial behavior is associated with, and predictable from, low resting heart rate (HR) in children, adolescents, and adults (Lahey, Hart, Pliszka, Applegate, & McBurnett, 1993; Raine, Venables, & Sarnoff, 1997). Because low HR is associated with greater aggression, and aggression and concern for others are inversely related, it may be that high HR should predict greater concern for others. Examining the current sample at preschool age, Zahn-Waxler et al. (1995) found that HR was positively correlated with concerned responses toward adults who were simulating injuries. Eisenberg and her colleagues (e.g., Eisenberg, Fabes, Murphy, et al., 1996; Fabes, Eisenberg, & Miller, 1990), however, have generally not found measures of HR to relate strongly to children's reports of their empathy or sympathy.

Vagal tone ( $\hat{V}$ ), a measure of HR variability, was used to index the efficiency of the autonomic nervous system (Porges & Byrne, 1992) in terms of general arousal thresholds and the ability to regulate arousal. Because higher resting  $\hat{V}$  has been associated with better self-regulation (e.g., Fox & Field, 1989), it has been hypothesized to relate positively to showing concern for others in distress (Eisenberg et al., 1995). However, there is little support for this in the literature. As  $\hat{V}$  may also mark the threshold for arousal, it is plausible that the opposite relation should be expected: Children with high  $\hat{V}$  may be unresponsive to distress in others because such distress is not a strong-enough stimulus to evoke empathy. This inverse relation has been shown in this sample at preschool age (Zahn-Waxler et al., 1995) and in independent studies (Eisenberg et al., 1995; Eisenberg, Fabes, Karbon, et al., 1996; Eisenberg, Fabes, Murphy, et al., 1996).

### Socialization and Concern for Others

Several aspects of parental socialization have been implicated in children's expressions of concern for others (see review by Eisenberg & Fabes, 1998), including authoritative parenting, authoritarian parenting, and parents' negative affect (Baumrind, 1971; Grusec, 1991a; Janssens & Dekovic, 1997). These dimensions encompass, and are related to independent measures of, parental behaviors, emotional experiences and expressions, and cognitions and attitudes regarding child rearing (Hastings & Rubin, 1999;

Kochanska, Kuczynski, & Radke-Yarrow, 1989). Authoritative parenting includes being warm, responsive, and supportive, establishing guidelines for behavior, and using reasoning in conjunction with controlled discipline. Authoritarianism centers on harsh, restrictive, punitive, and inappropriately controlling parenting. Negative affect within the context of child rearing includes the extent to which parents feel and show anger, frustration, and disappointment with their children (Block, 1981; Kochanska et al., 1989).

More than 3 decades ago, Baumrind (1967) found that preschoolers who behaved in prosocial ways with their peers most often had parents who used an authoritative rather than an authoritarian or a permissive style of parenting. Many studies have replicated the pattern. Maternal parenting that reflects authoritative approaches and de-emphasizes authoritarianism and negative affect has been linked to children's concern for others at home (Robinson, Zahn-Waxler, & Emde, 1994; Zahn-Waxler, Radke-Yarrow, & King, 1979), in school settings (Krevans & Gibbs, 1996), in the laboratory (Eisenberg et al., 1992; Eisenberg, Fabes, & Murphy, 1996; Eisenberg, Fabes, Schaller, Carlo, & Miller, 1991), and across cultures (Dekovic & Janssens, 1992; Janssens & Dekovic, 1997). Most studies have considered only contemporaneous associations. However, Robinson and her colleagues (1994) found that maternal warmth predicted high levels of empathic responding from 14 to 20 months of age, and maternal negative control predicted decreases in empathic responding over this period. Kochanska (1991) also found that authoritative and nonpunitive parenting by mothers of toddlers predicted more prosocial responses to vignettes when children were 8 to 10 years of age. Additional longitudinal work is necessary to determine whether these aspects of parenting contribute to stability or change in children's concern for others over time.

### Concern for Others as a Moderator of Stability of Externalizing Problems

The presence or maintenance of concern for others may function as a protective factor against the stability of externalizing problems. Empathy should provide immediate, proximal feedback that discourages aggressive acts by making the perpetrator of the aggression aware of, and possibly sympathetic toward, the pain suffered by the victim. There is some evidence for this line of reasoning. Tremblay and his colleagues (1992) found that disruptive 6-year-old boys who also were highly prosocial engaged in fewer disruptive behaviors 3 years later than did boys who were disruptive and less prosocial. Following individuals from middle childhood into adulthood, Hamalainen and Pulkkinen (1995) found that adult men and women who had been more prosocial as children were less likely to have been arrested or convicted of repeat offenses; criminality was greatest among adults who had been high in aggression and low in prosocial behavior as children. Concern for others is thus expected to moderate the stability of children's externalizing problems over time. That is, young children who have both externalizing problems and great concern for others may be less likely to maintain their levels of externalizing problems over time, compared with children who have externalizing problems and relatively little concern for others.

### Summary and Hypotheses

We followed three groups of children from preschool into the elementary school years who varied in their risk for the development of disruptive behavior disorders. On the basis of mothers' and teachers' reports, children of preschool age had low, moderate, or high rates of externalizing problems. We used behavioral observations, physiological assessments, self-reports, and the reports of mothers and teachers to test the following predictions.

First, observed concern for others was expected to increase from 5 to 7 years of age. Second, in comparison to children with fewer problems, children with moderate and greater problems were expected to develop deficits in their concern for others by 7 years of age. Third, children with more behavior problems were expected to show more disregard for others than children with fewer problems. We also expected to find sex differences; consistent with the majority of studies in the literature, we predicted that boys would score lower than girls on all measures of concern. Fourth, we expected to find moderate individual stability in concern for others from 5 to 7 years of age, as well as consistency in the measures of concern within each age. Fifth, concern for others was expected to moderate the development of externalizing behavior problems, acting as a protective factor against the maintenance or exacerbation of problems over time. Sixth, cardiac measures of children's autonomic arousal to sadness and distress in others were expected to be associated with children's concern for others in preschool and 2 years later. Finally, we predicted that concern for others would be positively associated with mothers' reports of authoritative parenting and negatively associated with their authoritarian parenting and negative affect. Disregard for others was expected to share opposite relations with psychophysiology and socialization variables than were expected for the measures of concern for others.

### Method

#### *Sample and Recruitment*

This investigation was based on data collected as part of an ongoing study of children at varying levels of risk for the development of disruptive behavior disorders. The initial sample consisted of 51 male and 31 female 4-5-year-old children (mean age = 54.68 months,  $SD = 3.28$ ) living in a major urban community, the parents of whom were contacted through newspaper announcements and flyers to preschools and daycare providers (see Cole, Zahn-Waxler, Fox, Usher, & Welsh, 1996, for further details). Children with mental or physical challenges (e.g., hearing impairment, autism) that were outside the purview of the investigation or who scored in the subaverage range on the McCarthy Scales of Children's Abilities (McCarthy, 1970) were excluded from participation. Participating families were predominantly Caucasian ( $n = 67$ ), two-parent ( $n = 73$ ), and of middle to upper-middle socioeconomic status (SES) on the Hollingshead (1965) index (mean SES = 54.5).

*General risk classification.* Children were classified as being at low, moderate, or high risk for developing disruptive behavior disorders. Risk designation was determined by mothers' use of the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) and the Eyberg Child Behavior Inventory (ECBI; Eyberg & Robinson, 1983) to report on their children, and teachers' use of the Teacher Report Form (TRF; Achenbach & Edelbrock, 1986) and the Preschool Behavior Questionnaire (PBQ; Behar & Stringfield, 1974). High risk was defined by CBCL total behavior problem  $T$  scores greater than or equal to 70, or TRF behavior problem scores at or

above the 85th percentile.<sup>1</sup> Moderate risk was defined by CBCL *T* scores greater than 60 but below 70, or TRF scores between the 70th and 85th percentile, or scores on the ECBI or PBQ that were more than one standard deviation above published norms. Children with lower scores on the CBCL, TRF, ECBI, and PBQ were determined to be at low risk.

The final distribution of children at Time 1 (T1) was 31 children at high risk (20 boys, 11 girls), 28 at moderate risk (20 boys, 8 girls), and 23 at low risk (11 boys, 12 girls). Analyses of variance (ANOVAs) and comparisons of means confirmed that all three groups differed from each other on the externalizing scores of both the CBCL and TRF (high > moderate > low, all  $ps < .0001$ ). Boys and girls did not differ on their externalizing symptoms. Extensive documentation of the norming procedures, reliability, and validity of the CBCL and TRF is contained in Achenbach's (1991) guide.

**Sample retention at Times 2 and 3.** Two years after T1, 77 families, including 29 children at high risk (18 boys, 11 girls), 26 at moderate risk (19 boys, 7 girls), and 22 at low risk (10 boys, 12 girls), agreed to continue participation. Mean age at Time 2 (T2) was 84.48 months ( $SD = 4.2$ ). The five families who withdrew did not differ significantly from the 77 who continued in terms of T1 demographic variables or variables examined in the present investigation. Two to 3 years later, CBCL and TRF data were again obtained for 72 children: 27 children at high risk (16 boys, 11 girls), 24 at moderate risk (19 boys, 5 girls), and 21 at low risk (10 boys, 11 girls); mean age at Time 3 (T3) was 116.40 months ( $SD = 5.04$ ). No T1 or T2 variables distinguished the five families who withdrew after T2 from the 72 families who continued, nor did the families who withdrew at either T1 or T2 differ from the 72 families who continued.

### Procedure at T1

Children made five visits to the laboratory at T1. This investigation includes data obtained in three of these sessions. In Session 1, observations were made of children's responses to a female experimenter who was simulating distress. In Session 3, children's cardiac responses (HR,  $\dot{V}$ ) to a mood-induction paradigm were assessed. In Session 4, children's responses to their mother's simulation of distress were observed. On average, 2–3 months separated each session. Detailed descriptions of these procedures are described in Zahn-Waxler et al. (1995).

**Distress simulations.** In both simulations, pain and emotional distress were portrayed in the presence of the child by inserting scripted depictions of minor accidents into the ongoing activities. Both the experimenter and the mother pretended to injure her foot while also dropping some objects on the floor. In each case, the adult winced or grimaced, vocally expressed pain, and rubbed the injured area, according to a specified script.

**Psychophysiological assessment.** Measures of cardiac function were taken while children viewed a 12-min videotape depicting a child experiencing eight emotionally charged events (Cole, Jordan, & Zahn-Waxler, 1990). Two vignettes showed the child experiencing sadness in response to distressing events: losing his or her dog, and a grandfather being ill and possibly near death. Each vignette started with a 15-s story lead-in, followed by 30 s of emotional display, and ending with a 15-s pleasant resolution. Each vignette was preceded by a starfield, shown for 15 s.

The cardiac variables were collected via three disposable electrocardiogram (ECG) electrodes on the child's chest, under the shirt. A Coulbourn ECG amplifier and filter module (Coulbourn, Allentown, PA, Model S75-38) transmitted the ECG signal, which was recorded on one channel of a Vetter Model CFM instrumentation recorder (A.R. Vetter, Redensburg, PA). Digitization of this recorded signal at 512 Hz was performed by means of an RTA 815 Analog Devices A/D board (Analog Devices, Cambridge, MA) and HEM acquisition software (HEM DataCorp., Southfield, MI). Interbeat intervals (IBIs) were calculated from the lag between R spikes. IBI data during the 30 s depictions of sadness were examined with MXEDIT software (Porges, 1985) to calculate the measures of HR and  $\dot{V}$ .

Similar cardiac responses were obtained for both vignettes. Mean HR and  $\dot{V}$  during the first depiction of sadness were 92.91 and 6.67, respectively; during the second, they were 93.96 and 6.56, respectively. Cardiac measures were significantly correlated across the vignettes,  $r(78) = .97$  for HR and  $.94$  for  $\dot{V}$  (both  $ps < .0001$ ). Because of the similarity of cardiac responses to the distress vignettes and the utility of decreasing the number of correlations to be calculated, average scores across the two distress vignettes were taken. The average HR and  $\dot{V}$  scores were examined for risk and sex differences in separate  $3 \times 2$  ANOVAs. There were no significant effects.

**Maternal report on parenting.** Mothers completed the Child Rearing Practices Report (CRPR; Block, 1981) 6 months after the T1 laboratory procedures. The CRPR was completed at home and returned by mail (see Denham et al., 2000, for administration details). The CRPR comprises a set of 91 index cards, each with a statement describing a possible parenting practice or attitude. Mothers were instructed to sort the 91 cards into 7 separate piles containing 13 cards each and to put each pile into an envelope that labeled how well the cards described her socialization approaches, from 1 (*most unrepresentative*) to 7 (*most descriptive*).

Three dimensions of maternal socialization were extracted from responses to the CRPR. The measures of maternal authoritative and authoritarian parenting were identical to those identified by Kochanska and her colleagues (1991; Kochanska et al., 1989). The authoritative dimension reflected the use of reasoning and guidance, encouragement of independence, and support for open expression of affect ( $\alpha = .67$ ). The authoritarian dimension included mothers' discouragement of expressivity, issuing of prohibitions and reprimands, control by anxiety inductions, strict supervision, and corporal punishment ( $\alpha = .61$ ). Authoritarian and authoritative scores were substantially negatively correlated,  $r(77) = -.53$ ,  $p < .001$ . Therefore, to reduce the number of variables being examined, we standardized the scales and subtracted authoritative scores from authoritarian scores (as has been done in previous studies; e.g., Hastings & Rubin, 1999). The resulting scores constituted a dimension of parenting style that ranged from low authoritarianism/high authoritative (low) to high authoritarianism/low authoritative (high). Maternal affect with her child was based on the Negative Affect factor described by Block (1981) and reflected feelings of anger, disappointment, and conflict ( $\alpha = .79$ ).

Mothers' authoritarian child-rearing and Negative Affect scores were examined in separate Risk  $\times$  Sex ( $3 \times 2$ ) ANOVAs to determine if there were any relevant group differences. There were main effects of risk for both variables:  $F_s(2, 72) = 4.92$  and  $5.07$  for authoritarian child rearing and negative affect, respectively,  $ps < .01$ . Mothers of high-risk children described their parenting as significantly more authoritarian and involving more negative affect ( $M_s = 0.65$  and  $10.48$ ,  $SD_s = 2.10$  and  $5.05$ , respectively), compared with mothers of low-risk children ( $M_s = -0.88$  and  $6.41$ ,  $SD_s = 1.13$  and  $3.81$ , respectively). Scores for mothers of moderate-risk children were intermediate to, and nonsignificantly different from, these extremes ( $M_s = 0.03$  and  $8.33$ ,  $SD_s = 1.46$  and  $4.02$ , respectively). These group differences are consistent with a previous examination of mothers' restrictiveness and nurturance (Rickel & Biasatti, 1982) as measured by the CRPR (Denham et al., 2000).

### Procedure at T2

Observations of the children's responses to the mother's and experimenter's distress simulations, children's self-reported empathy, and moth-

<sup>1</sup> At the time the sample was recruited, the TRF had not been standardized for this age group. The 85th percentile was used as the high-risk cutoff and the 70th percentile as the moderate-risk cutoff on the basis of the recommendations of T. M. Achenbach (personal communication, August 15, 1988).

ers' reports of children's empathy and conscience all were assessed during one visit to the laboratory. Mothers completed the CBCL during a separate visit. Teachers completed the TRF and reported on the children's prosocial behavior and social competence in a package of questionnaires that were sent and returned by mail.

*Distress simulations.* The simulations were conducted in a fashion similar to those at Time 1, in the context of the child's ongoing activities. The simulated injuries of the mother and experimenter occurred in different rooms and more than an hour apart. Observations were made of 74 children's responses. However, two mothers did not perform the simulation as requested, and therefore data were only available on their children's responses to the experimenter's simulation of injury. Equipment failure caused the loss of data for 3 other children's responses to both simulations.

*Children's self-reported empathy.* Children were administered the Bryant Empathy Scale (Bryant, 1982). The Bryant Scale is a widely used measure of children's empathic tendencies and comprises 22 statements answered in a true-false format. Each statement—for example, "Seeing a boy who is crying makes me feel like crying" and "It's hard for me to see why someone else gets upset" (reverse scored)—was printed on a separate index card. Two boxes, one labeled "Me" and one labeled "Not Me," were placed in front of the child. The experimenter read each statement and then asked the child to put the card into the "Me" box if it described the child or into the "Not Me" box if it did not. This procedure was completed successfully by 73 children; the mean score was 11.96 ( $SD = 2.83$ , range = 6–19), and the coefficient alpha for the present sample was .69.

*Mothers' reports of children's empathy and conscience.* To obtain mothers' descriptions of their children's empathy and other behavioral and affective aspects of conscience development, mothers completed the My Child measure (Kochanska, 1992; Kochanska, DeVet, Goldman, Murray, & Putman, 1994). The My Child comprises 100 statements that are rated from 1 (*extremely untrue*) to 7 (*extremely true*)—for example, "Acts upset when s/he sees a hurt animal" and "After having done something naughty, asks to be forgiven." The subscales of the My Child include Empathy (13 items), Affective Discomfort After Wrongdoing (18), Apology (6), Concern About Others' Transgressions (7), Concern Over Good Feelings With Parent (8), Confession (7), Internalized Conduct (20), Reparation (9), Sensitivity to Flawed Objects (7), and Symbolic Reproduction of Wrongdoing (5). This measure was completed by 71 mothers; the mean scores for the subscales ranged from 3.62 ( $SD = 1.18$ ) for Symbolic Reproduction of Wrongdoing to 5.36 ( $SD = 0.71$ ) for Empathy. The coefficient alpha for Sensitivity to Flawed Objects was moderate (.54), but all other scales showed very good internal consistency, with alphas ranging from .74 for Concern About Others' Transgressions to .91 for Internalized Conduct (mean  $\alpha = .81$ ).

Mothers' scores on the 10 scales of the My Child measure were examined in a factor analysis to detect underlying latent variables. A two-factor solution was reached. Scores on the Empathy scale loaded above .40 on both factors; therefore, children's scores on this scale were examined separately rather than aggregated into a factor (for Empathy,  $\alpha = .79$ ). All other scale scores loaded highly onto only one of two factors. The first factor (eigenvalue = 3.87) comprised Confession, Apology, Reparation, Concern About Others' Transgressions, and Internalized Conduct. As these scales all reflected aspects of addressing transgressions and understanding appropriate behavior, scores were standardized and aggregated to form the Interpersonal Responsibility factor (overall  $\alpha = .82$ ). The second factor (eigenvalue = 1.45) comprised Affective Discomfort After Wrongdoing, Concern Over Good Feelings With Parent, Sensitivity to Flawed Objects, and Symbolic Reproduction of Wrongdoing. This factor was less relevant to the current research questions and hence was dropped from further analyses.

*Teachers' reports of children's prosocial behavior and social competence.* Teachers completed a set of measures assessing aspects of children's helpful and positive behaviors in the classroom. These measures

included 3 items from the Assessment of School Behavior (Cassidy & Asher, 1992; e.g., "This child is helpful toward other children"), 6 items from the Teacher Child Rating Scale (Hightower et al., 1986; e.g., "Sensitive to other children's feelings"), and 13 items from the Peer Relationships and Social Skills Ratings (Dodge & Somberg, 1987; e.g., "Other children like this child and seek him or her out for play" and "Is understanding of others' feelings"). The questionnaires were completed and returned by 69 teachers. Separate factor analyses on the 22 individual items and on the subscales derived from the different measures both supported a single-factor solution, with strong positive loadings (all  $> .55$ ) for all scores. The coefficient alpha for a summary measure of the 22 items was .97. Therefore, a single overall score was computed for teachers' reports of children's Prosocial Behaviors With Peers at School.

### *Children's Behavior Problems at T3*

At T3, mothers completed the CBCL, and teachers completed the TRF. The CBCL was completed by 70 mothers. The TRF was completed and returned in the mail by 56 teachers. Reports on behavior problems from one or both informants were available for 72 children.

### *Coding of Children's Responses to Distress Simulations*

Two aspects of children's responses to the simulated accidents of mother and experimenter were coded: *concern for others* and *disregard for others*. A prior coding scheme assessing multifaceted aspects of concern had been applied to these data (Zahn-Waxler et al., 1995). For the current research questions, however, a new code of concern for others was developed. Concern for others scores were based on ratings, from 1 (*absent*) to 7 (*strong*), of the global concerned responding of children, incorporating facial, vocalic, and behavioral expressions of empathy, sympathy, and helpfulness (see Table 1 for descriptions of each point on the scale). Observed concern for others was coded by Paul Hastings and a research assistant. Intraclass correlations were used to examine coder agreement across 59 simulations (21% of the data); ratings of concern corresponded at .77.

Dana Bridges and another research assistant were responsible for coding the behaviors included in the disregard for others scores. Children's disregard for others to the simulated distress was coded from 1 (*absent*) to 4 (*strong*), with one point being assigned for the display of each of three responses: (a) anger toward the victim, (b) amusement or derisiveness, and (c) avoidance of or withdrawal from the victim. These behaviors were grouped on the conceptual basis that each could imply callousness or an unwillingness to acknowledge the needs of others, and they have proven to be an effective measure in a prior, independent study (Zahn-Waxler, Robinson, & Emde, 1992). Each specific behavior occurred with low frequency, limiting the internal consistency for the aggregate ( $\alpha = .50$ ), but the aggregate provided sufficient variability to permit analyses. As coders were able to distinguish the presence or absence of each behavior, kappa coefficients were used to calculate reliability. The coders had extensive training and experience coding children's reactions to simulations of injuries and had demonstrated high reliability with a large, independent sample (Zahn-Waxler et al., in press). Their reliability for the current sample was tested on 18 cases ( $\kappa = 0.88$ ). All coders were blind to children's risk-group status.

## Results

First, we examined whether children with high, moderate, and low levels of behavior problems differed in their development of observable concern and disregard for others from 4–5 to 6–7 years of age. Second, we considered whether teachers, mothers, and the children themselves perceived differences in empathy and proso-

Table 1  
*Rating Scale for Children's Global Concern for Others in Distress*

Scale point	Description
1	No concern evident.
2	Interested, some attention but little evidence of concern. Any questions or statements are factual, for gathering information (e.g., "What happened?").
3	Child sobers, sustains attention for at least 10 s; <i>or</i> mild or brief expression of facial concern; <i>or</i> isolated act of assistance (e.g., picking up dropped object, without accompanying expression of concern, although may look "pleasant" [e.g., small smile]).
4	Sustained attention <i>with</i> some expression of concern (facial [e.g., eyebrows raised and drawn together], vocalic [e.g., "Ooooh!" or "Are you okay?"], or physical [e.g., approach or touch] concern); <i>or</i> mild concern combined with single act of assistance.
5	Displays a variety of responses indicating concern (e.g., coordinated assistance [more than single act]); <i>or</i> moderate concern with a single act of helping; <i>or</i> combined expressions of moderate concern (e.g., vocalic and physical).
6	Combined expressions of strong concern; <i>or</i> strong concern with a single helpful act; <i>or</i> multiple helpful acts with some accompanying concern. <i>Absence</i> of any selfish, callous, or angry responses.
7	Strong displays of concern <i>with</i> very helpful acts; <i>or</i> very high concerned prosocial responses and verbalizations of reassurance (e.g., approach, hug, say "You'll be okay," and stay in proximity). <i>Absence</i> of any selfish, callous, or angry responses.

cial behavior when the children were 6–7 years of age, depending on their level of behavior problems at 4–5 years of age. Third, the consistency between different measures of concern and the stability of concern for others from 4–5 to 6–7 years of age were examined. Fourth, regression analyses were used to determine if concerned responding moderated the stability of externalizing problems from preschool to middle childhood. Fifth, we examined whether children's physiological reactions to distress and mothers' socialization approaches when children were 4–5 years of age were associated with children's concern for others at 4–5 years of age and predictive of their concern at 6–7 years of age.

Table 2 presents the means and standard deviations for observations of children's responses to distress simulations at T1 and T2 and for children's self-reported empathy, mother-reported Empathy and Interpersonal Responsibility, and teacher-reported Prosocial Behavior With Peers at T2. Means are presented by risk group and sex of child.

#### *Observations of Responses to Distress at T1 and T2*

**Concern for others.** A four-way ( $3 \times 2 \times 2 \times 2$ ) repeated measures ANOVA was used to examine the ratings of children's observed concerned responses to injuries simulated by mothers and a female experimenter at T1 and T2. Between-groups factors were risk group and child sex; within-groups factors were target (mother vs. experimenter) and time. Children were not included in this analysis if any observational data were missing (e.g., if mother did not perform the simulation at T2), resulting in a total sample size of 71 for this ANOVA. There were main effects of sex,  $F(1, 65) = 10.00, p < .01$ , and time,  $F(1, 65) = 4.89, p < .05$ , and a Risk  $\times$  Time interaction,  $F(2, 65) = 3.80, p < .05$ . Overall, girls were observed to show more concern for others ( $M = 4.67, SD = 1.29$ ) than were boys ( $M = 3.77, SD = 1.06$ ). Counter to our expectations, the strength of concerned responses decreased from T1 ( $M = 4.42, SD = 1.47$ ) to T2 ( $M = 3.82, SD = 1.61$ ). However, the significant interaction term indicated that this decrease in concern was moderated by children's initial risk status.

Paired  $t$  tests, with alpha corrected for number of tests, revealed that ratings of concern for others did not change significantly from T1 to T2 for children at low risk or moderate risk but dropped significantly for those at high risk. Least significant difference (LSD) tests did not show significant risk-group differences within either time point (previously reported at T1 in Zahn-Waxler et al., 1995).

**Disregard for others.** The four-way ANOVA for the observations of children's disregard for others revealed main effects of target,  $F(1, 65) = 8.05, p < .01$ , and sex,  $F(1, 65) = 17.34, p < .001$ , and an interaction of Risk  $\times$  Sex,  $F(2, 65) = 4.18, p < .05$ . Across both time points, children directed more disregard to their mothers than to the experimenters ( $M_s = 1.34$  and  $1.14, SD_s = 0.45$  and  $0.26$ , respectively). Examining the interaction term with LSD tests revealed that, across both time points, high-risk boys showed more disregard for others ( $M = 1.48, SD = 0.26$ ) than did all other children, and moderate-risk boys ( $M = 1.28, SD = 0.26$ ) showed more disregard for others than did high-risk girls ( $M = 1.03, SD = 0.08$ ; for low-risk boys, low-risk girls, and moderate-risk girls,  $M_s = 1.23, 1.13, \text{ and } 1.13, SD_s = 0.30, 0.13, \text{ and } 0.21$ , respectively). Examinations within time points showed that high-risk boys had the highest levels of disregard for others at both T1 and T2.

#### *Reports of Children's Concern at T2*

**Children's self-reported empathy.** Children's scores on the Bryant Empathy Scale were examined in a Risk Group  $\times$  Child Sex ( $3 \times 2$ ) ANOVA. There were main effects of both sex,  $F(1, 67) = 11.43, p < .01$ , and risk,  $F(2, 67) = 4.39, p < .05$ . Girls described themselves as more empathic than boys. LSD tests revealed that high-risk children described themselves as significantly less empathic than did moderate-risk children and tended to describe themselves as less empathic than low-risk children ( $p < .10$ ).

**Mothers' reports of children's empathy and interpersonal responsibility.** Two Risk  $\times$  Sex ( $3 \times 2$ ) ANOVAs were used to examine mothers' reports of child Empathy and Interpersonal



Table 2  
*Means and Standard Deviations for Observed Measures of Children's Concern at 5 Years of Age and Observed and Reported Measures of Concern at 7 Years of Age, Presented by Risk Group and Sex of Child*

Concern measure	Risk group			Sex of child	
	Low	Moderate	High	Boys	Girls
5-year-olds					
Observed concern for others					
<i>M</i>	4.25	4.21	4.80	4.16 <sub>b</sub>	4.84 <sub>b</sub>
<i>SD</i>	1.36	1.38	1.62	1.46	1.42
Observed disregard for others					
<i>M</i>	1.25	1.25	1.40	1.44 <sub>b</sub>	1.09 <sub>b</sub>
<i>SD</i>	0.37	0.42	0.50	0.49	0.20
7-year-olds					
Observed concern for others					
<i>M</i>	4.07	3.96	3.46	3.37 <sub>b</sub>	4.50 <sub>b</sub>
<i>SD</i>	1.75	1.74	1.32	1.31	1.80
Observed disregard for others					
<i>M</i>	1.09	1.23	1.20	1.23 <sub>b</sub>	1.09 <sub>b</sub>
<i>SD</i>	0.20	0.36	0.35	0.37	0.20
Child: Empathy					
<i>M</i>	12.41	12.75 <sub>a</sub>	10.89 <sub>a</sub>	11.20 <sub>b</sub>	13.18 <sub>b</sub>
<i>SD</i>	3.07	2.69	2.49	2.95	2.14
Mother: Empathy					
<i>M</i>	5.47	5.36	5.26	5.16 <sub>b</sub>	5.68 <sub>b</sub>
<i>SD</i>	0.57	0.90	0.65	0.74	0.55
Mother: Interpersonal Responsibility					
<i>M</i>	0.36 <sub>a</sub>	-0.03	-0.28 <sub>a</sub>	-0.12	0.20
<i>SD</i>	0.56	0.92	0.65	0.82	0.63
Teacher: Prosocial Behavior With Peers					
<i>M</i>	0.56 <sub>ac</sub>	-0.29 <sub>a</sub>	-0.16 <sub>c</sub>	-0.28 <sub>b</sub>	0.49 <sub>b</sub>
<i>SD</i>	0.81	0.84	0.85	0.84	0.79

Note. Risk group means that share the same subscript differ at  $p < .05$ . Sex-of-child means that share the same subscript differ at  $p < .01$ .

Responsibility. For Empathy, there was a main effect of sex,  $F(1, 65) = 9.56, p < .01$ . Daughters were described as more empathic than sons. For Interpersonal Responsibility, there was a main effect of risk,  $F(2, 65) = 4.07, p < .05$ . Mothers of low-risk children described their children as significantly more interpersonally responsible than did mothers of high-risk children and as somewhat more interpersonally responsible than did mothers of moderate-risk children ( $p < .10$ ).

*Teachers' reports of children's positive social behaviors with peers.* Examination of the Prosocial Behavior With Peers scores in a Risk Group  $\times$  Sex of Child ANOVA revealed main effects of sex,  $F(1, 63) = 8.69, p < .01$ , and risk,  $F(2, 63) = 3.67, p < .05$ . Girls were described as more prosocial than boys. Low-risk children were described by their teachers as more prosocial than either moderate- or high-risk children.

### Consistency and Stability of Concern

Because there were no interactions between the target and risk group factors in the preceding repeated measures ANOVAs, children's scores for their observed concern for others and disregard for others were averaged across mother and experimenter.<sup>2</sup> This technique has been used effectively in other investigations of

concern (e.g., Zahn-Waxler, Robinson, & Emde, 1992) to reduce the number of variables and create more stable assessments of behavior. Three mothers did not perform the simulation at T1, and two mothers did not perform it at T2. In these cases, the ratings of concern and disregard were based on the experimenter simulation only ( $n = 82$  at T1,  $74$  at T2). The intercorrelations of children's observed, self-reported, mother-reported, and teacher-reported indices of concern at T1 and T2 are presented in Table 3. There was moderate consistency across modes of assessment of children's concern at T2 and significant but limited stability over time. Observed concern at T1 was predictive of observed concern at T2.

<sup>2</sup> The ratings of observed concern for others toward mother and experimenter were positively but nonsignificantly correlated at both T1 and T2. Examination of the stability correlations separately for mother and experimenter revealed similar patterns of correlations. The correlations for concern for mother were slightly stronger than the correlations for concern for experimenter, but all correlations were in the same direction. For disregard for others, the relations between responses to mother and experimenter were similar to those for concern. However, as noted previously, there were far fewer instances of disregard directed to experimenter than to mother. The stability correlations for disregard for mother alone were

Table 3  
*Intercorrelations of the Measures of Concern at 5 and 7 Years of Age*

Concern measure	1	2	3	4	5	6	7	8
Age 5								
1. Concern for others	—	-.27** (78)	.29** (73)	-.13 (73)	.16† (72)	.12 (70)	.10 (70)	.15 (68)
2. Disregard for others		—	-.08 (73)	.02 (73)	.02 (72)	.01 (70)	-.06 (70)	-.24* (68)
Age 7								
3. Concern for others			—	-.42*** (73)	.17† (72)	.14 (70)	.13 (70)	.20† (65)
4. Disregard for others				—	-.09 (72)	-.34** (70)	-.24* (70)	.01 (65)
5. Child: Empathy					—	.31** (70)	.23* (70)	.15 (64)
6. Mother: Empathy						—	.45*** (70)	.18 (63)
7. Mother: Interpersonal Responsibility							—	.19 (63)
8. Teacher: Prosocial Behavior With Peers								—

Note. Numbers in parentheses are degrees of freedom.  
 †  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Disregard for others was not stable over time, but children who showed more disregard at T1 were seen by their teachers as less prosocial at T2. Children at T2 who showed more concern also tended to be seen by their teachers as more prosocial ( $p < .06$ ), whereas disregard for others was associated with lower Empathy and Interpersonal Responsibility scores from mothers. Children's reports of their own empathy also correlated with mothers' reports of their empathy and responsibility.

#### *The Moderating Role of Concern in the Development of Externalizing Problems*

**Data reduction.** Stepwise forward regression analyses were used to test for the moderating effects of concern in the development of externalizing problem behaviors. First, factor analysis and aggregation of variables were used to reduce the numbers of variables necessary for analyses and to create more stable constructs through multiple-source variables. At each age, mothers' and teachers' reports of children's externalizing problems were averaged; when one report was missing, the existing report was used as the sole indicator of externalizing problems. Externalizing problem scores were available for 82 children at T1, 76 children at T2, and 72 children at T3 (9–10 years;  $M_s = 58.52, 54.77,$  and  $54.22$ ;  $SD_s = 8.08, 9.18, 9.81$ ; ranges = 43–76, 30–81.50, and 37–76, respectively); correlations between mothers' and teachers' reports were  $r(76) = .24, p < .05$ ,  $r(69) = .32, p < .01$ , and  $r(57) = .47, p < .001$ , respectively.

Observed concern for others, averaged across mother and experimenter, was used as the sole index of concern at T1. The measure of concern at T2 was based on observed concern for

others and reported measures. First, mother-reported Empathy and Interpersonal Responsibility were aggregated into a single score. This was done so that mothers would not contribute proportionally more information to an overall aggregate measure of concern at T2 than would other sources of information (observers' ratings, children's self-report, teachers' reports). The combination of the maternal scores was supported by the original factor analysis, which showed that the Empathy subscale of the My Child measure had a loading of .42 on the Interpersonal Responsibility measure, and by the significant correlation between Empathy and Interpersonal Responsibility (see Table 3).

The average observed concern for others score, the single index of mother-reported empathy and responsibility, children's Bryant Empathy Scale scores, and teacher-reported Prosocial Behavior With Peers were standardized and examined in a factor analysis. All of the variables loaded highly and positively on a single dimension (loadings ranged from .59 to .67; eigenvalue = 1.60, accounting for 40% of the variance). Therefore, the standardized variables were weighted by their factor loadings and combined into a single aggregate concern index at T2 ( $\alpha = .49$ ). If one measure was missing (e.g., seven teachers did not complete the ratings of children's Prosocial Behavior With Peers), the aggregate concern index was computed from the other three scores; scores were computed for a total of 72 children.

*The development of externalizing problems from T1 to T2.* Because the test of the moderating effect of concern on the stability of externalizing problems required the use of interaction terms in the regressions, the method of analysis recommended by Aiken and West (1991) was used. All variables were centered by standardizing, thus decreasing potential collinearity, and the interaction term was calculated from the centered scores. Centered variables were entered into the regression predicting externalizing problem behavior scores at T2 in three steps (see Table 4). In Step 1, externalizing problems at T1 were found to predict exter-

almost identical to the correlations for the combined mother and experimenter disregard scores.



Table 4  
Regression Analyses of the Moderating Role of Concern in the Development of Externalizing Behaviors

Variable	$\Delta R^2$	$p$	$\beta$	$R$
Prediction of problems at Age 7				
Step 1				
5-year externalizing problems	.342	<.001	.59	.584
Step 2				
5-year observed concern	.029	<.10	-.17	.609
Step 3				
5-year Observed Concern $\times$ Externalizing	.040	<.05	-.20	.641
Adjusted $R^2 = .386$ $F(3, 72) = 16.70, p < .0001$				
Prediction of problems at Age 9				
Step 1				
7-year externalizing problems	.425	<.001	.66	.652
Step 2				
7-year aggregate concern index	.00	<i>ns</i>	.01	.652
Step 3				
7-year Aggregate Concern Index $\times$ Externalizing	.052	<.02	-.29	.691
Adjusted $R^2 = .453$ $F(3, 64) = 19.47, p < .0001$				

nalizing problems at T2 (the stability of externalizing scores in this sample has been reported previously in Denham et al., 2000). Despite this stability, Step 2 showed that the independent contribution of observed concern for others at T1 to the variance accounted for in externalizing problems at T2 approached statistical significance. Children who showed more concern toward their mothers or an experimenter simulating injury were reported to have fewer behavior problems 2 years later. In Step 3, the interaction of concern for others and externalizing problems at T1 was also shown to account for a significant, unique portion of the variance in externalizing problems at T2.

The interaction was plotted to compare the stability of externalizing problems from T1 to T2 for low ( $-1 SD$ ), moderate (at the mean), and high ( $+1 SD$ ) values of observed concern at T1 (see Figure 1) in order to examine whether the hypothesized moderator role for children's concerned responding was supported. Externalizing problems were most stable from T1 to T2 for low,  $t(72) = 6.01, p < .0001$  (slope = .85), and moderate,  $t(72) = 7.00, p < .0001$  (slope = .66), values of observed concern at T1. The stability of externalizing problems was moderately attenuated when T1 concern was higher,  $t(72) = 4.03, p < .001$  (slope = .46). As shown in Figure 1, the moderating influence of concern for others was evidenced by the decreased ability to predict externalizing scores at early elementary school age years from externalizing scores at preschool age when observed concern for others was higher at preschool age.

To determine whether the significant interaction term also reflected a moderating influence of concern on changes in mean level of externalizing problems from T1 to T2, a median split was performed on concern for others at T1. Paired  $t$  tests were used to compare externalizing  $T$  scores at T1 vs. T2 for children who were relatively low in concern and for children who were relatively high in concern. For children who were higher in concern, the actual number of externalizing problems decreased significantly from T1 ( $M = 58.60, SD = 8.31$ ) to T2 ( $M = 54.06, SD = 8.34$ ),  $t(38) = 3.56, p < .05$ , whereas the problem scores of children lower in concern did not change significantly over this period ( $M_s = 57.66$  and  $56.41, SD_s = 7.40$  and  $9.46$ , respectively),  $t(36) = 1.07$  (*ns*). Thus, concern for others moderated both the stability and the severity of children's externalizing problems from the preschool to the early elementary school years.

The development of externalizing problems from T2 to T3. A parallel regression analysis was performed to predict externalizing problems at T3 (see Table 4). Externalizing problems were again shown to be highly stable from T2 to T3, but the aggregate concern index at T2 was not a significant predictor of problems at T3. The interaction of the aggregate concern index and externalizing problems at T2, however, did account for a significant, unique portion of the variance in externalizing problems at T3.

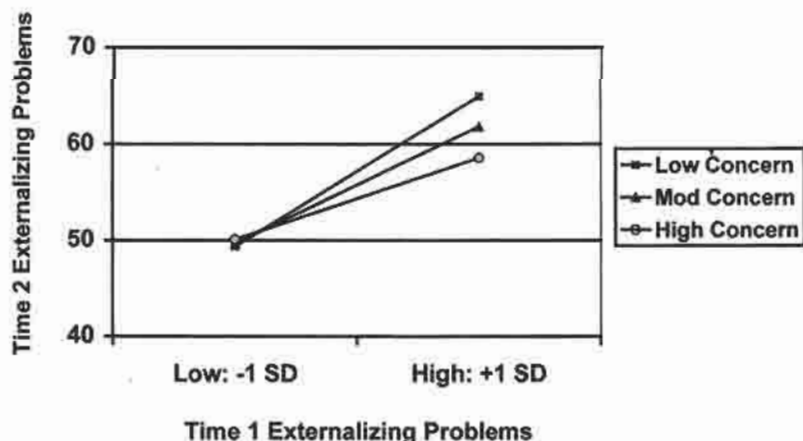


Figure 1. The moderating role of children's concern at 5 years of age on development of externalizing problems from 5 to 7 years of age.

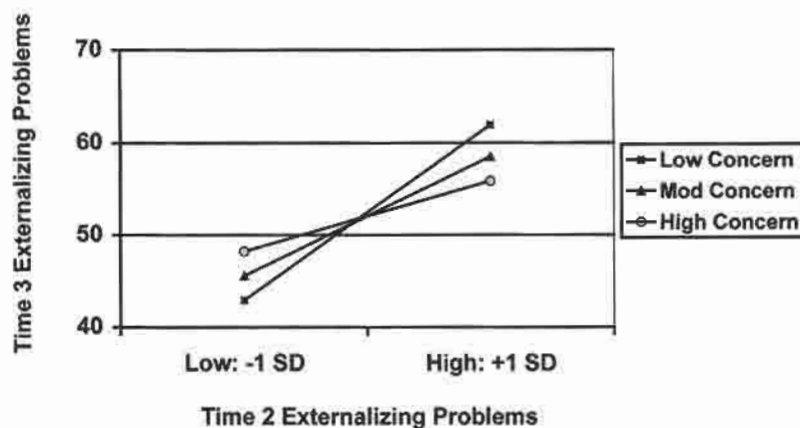


Figure 2. The moderating role of children's concern at 7 years of age on development of externalizing problems from 7 to 10 years of age.

Again, the interaction was plotted to compare the stability of externalizing problems from T2 to T3 for low ( $-1 SD$ ), moderate (at the mean), and high ( $+1 SD$ ) values of the aggregate concern index at T2 (see Figure 2). Externalizing problems at T3 were most predictable from T2 problem scores for low,  $t(64) = 6.07, p < .0001$  (slope = .97), and moderate,  $t(64) = 6.33, p < .0001$  (slope = .68), levels of aggregated concern at T2. The slope was markedly reduced when scores on the T2 aggregate concern index were higher,  $t(64) = 2.54, p < .01$  (slope = .39). Figure 2 shows that the moderating influence of concern on the stability of the development of severe externalizing problems in children persisted from 6–7 years to 9–10 years.<sup>3</sup>

To determine whether the moderating influence of the aggregate concern index at T2 also contributed to mean level changes in externalizing problems from T2 to T3, a median split was used to create two groups of children who were relatively high versus

relatively low on the T2 aggregated concern index. Paired  $t$  tests were used to examine changes in externalizing problems within each group. On average, the more concerned group had few externalizing problems at T2, and this did not change (mean  $t$  scores = 51.12 and 51.43,  $SDs = 8.49$  and  $8.75$ , respectively),  $t(33) = -0.21$  (*ns*). There was a nonsignificant decrease in behavior problems over this period for the less concerned group ( $Ms = 58.90$  and  $56.16, SDs = 8.09$  and  $10.59$ , respectively),  $t(33) = 2.30, p < .12$ . Thus, although concern continued to moderate the stability of externalizing problems after 6–7 years of age, it did not appear to continue moderating the severity of problems into middle childhood.

#### Predicting Children's Concern From Psychophysiological Variables

Correlations between children's cardiac responses to the distress vignettes and the observed and reported measures of concern at T1 and T2 are presented in Table 5. We examined the correlations between cardiac responses and the measures of concern separately for responses to the first and second vignettes. In general, the magnitude of correlations was slightly higher for responses to the second vignette than for responses to the first, but overall, very similar patterns of results were obtained. This consistency supported the decision to use cardiac scores averaged across the two vignettes for the correlational analyses.

First the concurrent associations between psychophysiology and observed responses to injury simulations at T1 were examined.

Table 5  
Correlations Between Psychophysiological Responses at 5 Years of Age and Measures of Children's Concern at 5 and 7 Years of Age<sup>a</sup>

Concern measure	Physiological responses		
	<i>df</i>	Heart rate	Vagal tone
Age 5			
1. Concern for others	78	.25*	-.19†
2. Disregard for others	78	-.03	-.09
Age 7			
3. Concern for others	70	.00	.06
4. Disregard for others	70	.16	-.12
5. Child: Empathy	69	.14	-.05
6. Mother: Empathy	67	.06	-.16
7. Mother: Interpersonal Responsibility	67	.02	-.02
8. Teacher: Prosocial Behavior With Peers	66	.22*	-.30**

<sup>a</sup> Partial correlations were used to predict observed behaviors at 7 years of age, controlling for the level of observed behavior at 5 years of age.

†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

<sup>3</sup> Although these analyses show that concern for others served to moderate the stability of externalizing problems over time, it is also possible that externalizing problems could play a similar role in the development of concern for others, serving to moderate the stability of concern. Therefore, we performed two regression analyses, in which we used observed concern at 5 years, externalizing problems at 5 years, and the interaction of these variables to predict (a) observed concern at 7 years and (b) the aggregate index of concern at 7 years. The analyses did not support a moderating role for externalizing problems, as neither interaction term approached significance (both  $ps > .70$ ).

Two-tailed *t* tests were used, because the literature was not considered consistent enough to make directional hypotheses about the relations between cardiac reactivity and concern for others. Separate analyses conducted for responses to the mother's and the experimenter's simulations of injury revealed similar patterns; therefore, correlations for the composite scores are reported. As previously reported (Zahn-Waxler et al., 1995), children who had higher HR and lower  $\hat{V}$  during the vignettes were observed to show more concern for others when their mothers or an experimenter simulated an injury.

The relations between cardiac responses to depictions of sadness at T1 and observed behaviors in response to adults' simulations of injury at T2 also were examined. To ensure that obtained relations were not due to stability in the children's behavior, we used partial correlations to control for the levels of observed behavior at T1. Thus, any significant results would suggest that early patterns of psychophysiological responding predicted the development of concerned and callous behavior. However, there were no significant partial correlations indicating a link between children's earlier physiological responding and their observed behavior at T2. There were also few indications that physiological responses were associated with later reports of the children's empathy and prosocial behavior. Only two of eight correlations (25%) involving self-reports, mothers' reports, and teacher's reports were significant: Children who had higher HR and lower  $\hat{V}$  during the vignettes were described by teachers as more prosocial. These relations are consistent with the T1 results, but given the number of nonsignificant correlations, the present findings should be regarded as tentative and in need of replication.

Relations between psychophysiological responses and measures of concern might not have been equivalent across risk or sex groups. Therefore, regression analyses including Group  $\times$  Predictor Variable interaction terms were conducted. For each regression, the main-effect predictors of risk, sex, and cardiac response were entered first, and then the two-way interactions of Risk  $\times$  Cardiac Response and Sex  $\times$  Cardiac Response were entered. For prediction of observed variables at T2, the corresponding T1 observed variables were also controlled by entry on the first step. After controlling for main effects, none of the 32 interaction terms for HR or  $\hat{V}$  was significant.

The general message extracted from the regression analyses was that the few obtained relations between psychophysiology and concern are consistent for children at low, moderate, and high risk for developing disruptive behavior disorders and also for boys and girls. Although centering variables improves the chances of detecting significant interaction effects in regression analyses (Jacquard, Wan, & Turrisi, 1990), it should still be recognized that our sample size offered relatively low power to detect significant interactions.

#### Predicting Children's Concern From Socialization Variables

Children's concern was also examined in relation to mothers' reported approaches to parenting at T1. Because of the risk-group differences in maternal socialization scores, we used an additional analytical approach. After examining the correlations for the full sample, we also examined partial correlations controlling for risk

group for all concern measures. Regressions were then conducted to determine if risk group or gender interacted with maternal parenting in the prediction of concern.

The correlations are presented in Table 6. Mother-reported socialization variables at T1 were predictive of observations of children's concern and disregard for others at T2 but were not concurrently associated with observed behavior at T1. In total, 6 of the 12 predictive correlations (50%) reported in Table 6 were significant, one additional correlation approached significance, and all were in the predicted directions. Mothers with relatively more authoritarian child-rearing approaches had children who, 2 years later, were more likely to show disregard for others and tended to be less likely to show concern for others. In addition, mothers and teachers described the children at T2 as more empathic, interpersonally responsible, and prosocial when, 2 years earlier, mothers had described their parenting as predominantly authoritative and involving less negative affect.

Risk-group differences both in mothers' reported parenting and in most T2 measures of concern could have contributed to the appearance of relations between maternal socialization and children's concern. To examine this possibility, we used partial correlations to control for children's risk status. All of the correlations were reduced in magnitude, but four remained significant at  $p < .05$ . These were the relations between mothers' child-rearing style and mothers' reports of children's Empathy,  $r(68) = -.24$ , mothers' reports of children's Interpersonal Responsibility,  $r(68) = -.23$ , and teachers' reports of children's Prosocial Behavior With Peers,  $r(66) = -.25$ , and the relation between negative affect and mothers' reports of children's Interpersonal Responsibility,  $r(68) = -.28$ . In addition, the correlation between child-rearing style and observed disregard for others at T2 still approached significance,  $r(71) = .20$ ,  $p = .09$ . Thus, independently of children's earlier behavior problems, mothers' socialization practices predicted reports of children's concern 2 years later.

Table 6  
Correlations Between Maternal Socialization Approaches at 5 Years of Age and Measures of Children's Concern at 5 and 7 Years of Age<sup>a</sup>

Concern measure	df	Maternal socialization approach	
		Authoritarian	Negative affect
Age 5			
1. Concern for others	77	.14	.04
2. Disregard for others	77	-.02	.05
Age 7			
3. Concern for others	72	-.19†	-.11
4. Disregard for others	72	.23*	.18
5. Child: Empathy	71	-.05	.00
6. Mother: Empathy	69	-.27*	-.22*
7. Mother: Interpersonal Responsibility	69	-.32**	-.40***
8. Teacher: Prosocial Behavior With Peers	67	-.34**	-.09

<sup>a</sup> Partial correlations were used to predict observed behaviors at 7 years of age, controlling for the level of observed behavior at 5 years of age. †  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Regression analyses were also used to examine whether there were any moderating influences of sex or risk group for the relations between socialization measures and concern. Of the 32 two-way interactions examined for negative affect and authoritarian child-rearing, only 2 were significant (Risk  $\times$  Authoritarianism; Sex  $\times$  Negative Affect), no more than would be expected by chance.

### Discussion

Deficits in concern for others' well-being have long been held as one of the hallmarks of antisocial personality disorders, which by definition include a history of disruptive behavior (American Psychiatric Association, 1994). Studies with adolescents and adults have supported this characterization. However, the existence of these deficits early in the development of antisocial individuals heretofore has been presumed rather than documented. Consistent with other studies of young children (e.g., MacQuiddy et al., 1987), our initial investigation demonstrated that such deficits are not readily detectable in preschool-aged children with externalizing problems (Zahn-Waxler et al., 1995). More specifically, at least in the early years of life, concern for the welfare of others can exist in conjunction with behaviors that violate the rights of others and garner the displeasure of adults.

The current investigation showed that observable deficits in concern for others develop after the preschool years for children with clinical levels of behavior problems. These children actually decreased in the strength of their concerned responses over the transition from preschool to elementary school. Kochanska (1991) has suggested that early disruptiveness and later deficits in concern could be age-dependent manifestations of a common underlying predisposition for weak conscience. However, it is equally possible that deficits in concern and disruptive behavior disorders may reflect two distinct systems with etiologies that only overlap in part.

This is not to suggest that no early differences in how the children responded to adults' simulations of injuries were detected. Indeed, despite being just as prosocial as other preschool-aged children, moderate- and high-risk boys displayed more active disregard for others (e.g., anger, avoidance, amusement by another's distress), a negatively toned response pattern that differs markedly from the simple absence of concern. Mothers were the most frequent targets of disregard. The at-risk boys' displays of disregard toward their mothers' distress may have been fostered by the more authoritarian and negative parenting experiences they had. These boys may have experienced more emotional, and possibly physical, pain in their maternal relationships than had the other children. Their angry or detached stance when their mothers were in need may have reflected an effort to distance themselves or decrease their own arousal in distressing interactions. Whatever the principal cause, the stronger displays of disregard by boys at risk may serve as early indicators of differences in their affective responsiveness. Further attention to ways in which young children with behavior problems blend positive and negative responses during emotionally charged social interactions may be important for understanding the children's self-regulatory abilities, their perceptions of social cues and context, and their contributions to interpersonal exchanges.

Not all high-risk children decreased in their observed concern for others between preschool and early elementary school. Eight of the 25 high-risk children for whom there were observed data at both times maintained or increased their concern for others, which might serve to protect these children against stable, severe problems of aggression or disruptiveness. Even more pronounced heterogeneity appeared to characterize the moderate-risk group of children, who had quite disparate levels of self-reported empathy, teacher-reported prosocial behavior, and mother-reported empathy and concern for others. Within-group variability was also apparent when gender was considered. As expected, at all levels of risk and across most measures used, girls had higher concern scores than boys. It would be valuable to replicate these results with a larger sample of children at varying levels of risk for disruptive behavior disorders in order to determine whether identifiable subgroups follow divergent developmental trajectories.

Counter to our expectations, observed concern for others did not increase in the low-risk children from preschool age to the elementary school years. This inconsistency with existing literature may be due to methodological differences. This was the first investigation, to our knowledge, that used direct observations to examine the development of concerned responses toward others in distress in a group of children over this period. Most prior studies of this age range have been cross-sectional in design. Even the few longitudinal studies have assessed concerned responses by means of reports from parents and teachers or by placing children in situations requiring such abstract decision-making processes as choosing to donate earned prizes to sick children in a local hospital (e.g., Eisenberg & Shell, 1986; Grusec, 1972). The transition from 4–5 years to 6–7 years of age may be a period when responses to adults' needs do not change markedly for children without significant behavior problems. However, responsiveness to peers in need may increase, and levels of prosocial reasoning definitely develop over this time (Eisenberg, Lennon, & Roth, 1983).

One of the most salient results of this investigation was the demonstration of the protective role that concern for others may play in the development of children's externalizing behavior problems. Externalizing behavior problems were less stable from the preschool years to the early elementary school years, and also from the early- to mid-elementary school years, when children demonstrated more concern for others. In addition, the actual level of externalizing problems decreased from 4–5 to 6–7 years when the children had also displayed relatively more concern for others at 4–5 years (although concern at 6–7 years was not associated with further decreases in the actual level of problems from 6–7 to 9–10 years). These are important results, particularly given that, at preschool age, the high-risk children showed just as much concern in their responses to adults simulating injuries as did children with fewer problems. Fostering young children's attention to and concern for the needs of others may be an effective avenue of intervention for improving the developmental trajectories of children with early-appearing externalizing problems.

We found support for the potential of environmental factors to play such a role in the development of children's concern for others. Mothers' approaches to socialization were predictive of several measures of children's concern, even when children's initial risk status and the stability in children's levels of observed concern and disregard for others were controlled statistically. This

is an important extension to the literature associating parenting with children's prosocial development, which contains relatively few longitudinal studies. The present results clearly suggest that mothers who are overly strict and harshly punitive, who do not tend to reason or establish reasonable and consistent rules, and who strongly show their anger or disappointment with their children, are likely to impede their children's prosocial development. These relations were as true for children with behavior problems as for children without, suggesting that the development of concern in highly difficult young children is not less subject to influence by maternal socialization. However, the group differences in socialization suggest that the actual experiences of the three risk groups might contribute to divergent pathways of development.

Previous work with data from this investigation has demonstrated that mothers of high-risk children are more likely to act in angry, authoritarian ways than are mothers of low- or moderate-risk children, and that in turn, these negative approaches to parenting can exacerbate the externalizing problems of high-risk children (Denham et al., 2000; also see Dishion, Andrews, Kavanagh, & Soberman, 1996, for supporting evidence). The current analyses show that this negative parenting impacts other aspects of social behavior and affect as well and thus may have indirect effects upon aggression by undermining related competent behaviors. Experiencing more forceful and angry socialization, disruptive and aggressive children are less likely to maintain or develop their concern for others, and thus their aggressive tendencies may be further disinhibited.

There are several possible processes that could account for this pattern of relations. Angry, authoritarian parenting could be interpreted by the children as a lack of care or concern on the part of their parents. Modeling of this behavior, or internalization of parental messages that the child is bad, could then discourage the disruptive children's ability or willingness to consider and sympathize with the needs of others. Alternatively, the children may have experienced negative effects from a relative absence of opportunities to emulate a more reasoned and considerate approach to parent-child interactions. However, it should be emphasized that the present sample constituted a fairly homogeneous and economically privileged group. The relations between socialization and children's characteristics can be expected to vary across ethnic, cultural, and social groups (e.g., Chen et al., 1998; Deater-Deckard, Dodge, Bates, & Pettit, 1996). It also should be recognized that this study was conducted over the children's transition from preschool to the elementary school environment. Aggressive and disruptive children are known to elicit aggression and rejection from peers in elementary school (Coie, Belding, & Underwood, 1988). The high-risk children probably engaged in more frequent conflicts and were more regularly exposed to distress in others. Such experiences could have a desensitizing effect that would negatively impact the children's concerned responses. It will be necessary to explore further how contexts and social interactions function together to shape the development of children.

The predominantly nonsignificant relations between cardiac responses to depictions of distress and children's concern at 6-7 years of age were somewhat surprising. It is important to note that the concurrent significant relations at 4-5 years of age were consistent with our earlier report (Zahn-Waxler et al., 1995), despite our having recoded all injury simulations in order to obtain

a global, Gestalt measure of concerned responding. However, the lack of predictive value for the cardiac measures may suggest that the integration of affective, behavioral, and physiological response systems is specific to developmental periods or that there is a transition in the functional significance of cardiac reactivity over time. Our assessment of cardiac responses may have been too brief to serve as an effective measure of enduring cardiac function, although brief measures of HR have proven effective in other longitudinal studies (e.g., Raine et al., 1997). Alternatively, age-dependent increases in behavioral self-regulation and understanding of social standards for concerned behavior may come to contribute more to concerned responses than do physiological reactions. Finally, it may simply be the case that autonomic reactivity does not contribute as much to the development of concern for others as do socialization factors.

Despite the lack of association between earlier cardiac responses and later indices of concern, the present results do not rule out the possibility that late-maturing, biological factors could contribute to the changes in concern observed in the high-risk children. Given that genetics play a significant role in empathic and prosocial development (Zahn-Waxler et al., in press), it is reasonable to search for biological correlates and components of concern for others. It may be necessary to broaden assessments of potential physiological correlates (e.g., hormonal assays, EEGs, functional MRIs, and genetic analyses) or to refine the precision of the more commonly used measures of autonomic functions. One pertinent question is the relative value of examining indicators of arousal versus indicators of regulatory abilities, two aspects of autonomic function that were confounded in this investigation. Arousal and regulation are not completely independent, but they are likely to have different meanings for, and associations with, social behavior. The negative relation between vagal tone and a school-based measure of prosocial behavior that we observed has been found in at least two prior investigations (Eisenberg et al., 1995; Eisenberg, Fabes, Karbon, et al., 1996). This finding is more compatible with regarding vagal tone as a marker of threshold for arousal rather than as an index of dispositional regulatory ability. Disentangling these components of functioning from psychophysiological measures will be important in future work.

In conclusion, it is apparent that concern for others is an important aspect of young aggressive and disruptive children's interpersonal repertoires and that it undergoes dynamic and worrisome changes as they begin to enter middle childhood. Examining the responses of children at risk for disruptive behavior disorders in contexts in which one would not normally expect to see displays of aggression and disruptiveness, per se, extends our understanding of these children. First, they are capable of showing concern for others in distress and they can respond in caring ways. Children with externalizing problems and high concern for others are most likely to show decreases in their aversive behaviors over time. Interventions to protect those concerned responses from the general pattern of decreasing concern over time might be effective in guiding children with early-appearing aggressive and disruptive behaviors toward more desirable developmental pathways; parent-training techniques seem promising in this regard. Second, disruptive children's concern for others decreases as they enter the elementary school years. Further work will be necessary to determine whether disruptive children truly decrease in their abilities to



feel and show concern for others as they develop or whether these abilities are retained but selectively inhibited. Third, we detected patterns of blended positive and negative affective responses to distress in others in boys with behavior problems. These patterns may be indicative of particular forms of emotional dysregulation or social cognitive biases that contribute to negative trajectories. Using a longitudinal approach to the study of concern for others has revealed that models of aggressive and antisocial problems must be developmentally informed in order to understand the etiology and trajectories of, and possible interventions for, these aversive behavior patterns.

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## Call for Papers: *Emotion*

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