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Nancy Eisenberg

Arizona State University, nancy.eisenberg@asu.edu

Richard A. Fabes

Arizona State University

Mariss Karbon

Arizona State University

Bridget C. Murphy

Arizona State University

Marek Wosinski

Arizona State University

See next page for additional authors

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Authors

Nancy Eisenberg, Richard A. Fabes, Mariss Karbon, Bridget C. Murphy, Marek Wosinski, Lorena Polazzi, Gustavo Carlo, and Candy Juhnke

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Arizona State University

The purpose of this study was to examine the relations of a measure of children's dispositional prosocial behavior (i.e., peer nominations) to individual differences in children's negative emotionality, regulation, and social functioning. Children with prosocial reputations tended to be high in constructive social skills (i.e., socially appropriate behavior and constructive coping) and attentional regulation, and low in negative emotionality. The relations of children's negative emotionality to prosocial reputation were moderated by level of dispositional attentional regulation. In addition, the relations of prosocial reputation to constructive social skills and parent-reported negative emotionality (for girls) increased with age. Vagal tone, a marker of physiological regulation, was negatively related to girls' prosocial reputation.

Predictors and correlates of prosocial behavior (i.e., voluntary behavior intended to benefit another) often vary in type and strength across studies. This variability in findings likely is due, at least in part, to the fact that predictors of prosocial responding vary with the specific prosocial act being examined (e.g., sharing, helping, or comforting), as well as with aspects of the particular context, such as whether other people are present (e.g., Hampson, 1984; see Eisenberg & Mussen, 1989; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983).

Because dispositional measures of prosocial behavior (i.e., the general tendency to be prosocial) tap prosocial behavior across a variety of situations, such measures are particularly useful in the study of prosocial behavior. Correlates of dispositional prosocial behavior likely predict prosocial behavior in more

contexts than do variables that are predictors of prosocial behavior solely in specific contexts. Predictors of prosocial responding in specific situations (i.e., situational prosocial behavior) often reflect, to a large degree, contextual demands and factors, such as the potential for rewards or censure, who is present, and the cost of assisting (see Dovidio, 1984). Further, in specific situations, only those person variables relevant to specific contextual demands and cues may be operative.

Given the difficulties in generalizing from the results of studies of situational prosocial behavior, it is unfortunate that much of the research on prosocial behavior concerns prosocial acts in very specific situations, often in experimental laboratory contexts. There is considerably less research on children's dispositional or trait prosocial behavior, particularly as

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perceived by peers, and much of the existing work on children's prosocial dispositions is observational research conducted primarily with young children. Research on differences in dispositional prosocial behavior is needed to supplement work on situational factors related to prosocial behavior.

In studying dispositional prosocial behavior, it is logical to assume that dispositional person variables (e.g., aspects of temperament or personality) are likely to be reliable predictors of individual differences in prosocial behavior. However, there is surprisingly little research on the personality correlates of children's prosocial behavior (Eisenberg & Mussen, 1989; Graziano & Eisenberg, in press). Eisenberg and Mussen (1989) argued that three aspects of individuals' dispositional functioning related to prosocial responding are individual differences in children's emotionality, regulation, and social competence. However, they found relatively little research to back up these assertions. Thus, the purpose of the present study was to examine these three categories of dispositional predictors of school-aged children's prosocial reputations.

Eisenberg and Fabes (1992) proposed a heuristic model of the role of individual differences in regulation and emotionality in dispositional socioemotional functioning, including in prosocial behavior (see Fig. 1). In their heuristic model, prosocial behavior is conceptually linked to individual differences in

optimal regulation, including capabilities related to emotion regulation (e.g., the abilities to shift and focus attention, which often are considered aspects of temperament; Derryberry & Rothbart, 1988; Rothbart, Ziaie, & O'Boyle, 1992). Prosocial behavior also is associated in the model with constructive coping (e.g., instrumental coping, positive cognitive restructuring, planning). Further, Eisenberg and Fabes (1992) proposed that prosocial tendencies are correlated with individual differences in the tendency to experience positive rather than negative emotions and general social competence (e.g., social skills and popularity), in part because positive affect and social skills, like prosocial behavior, are viewed as stemming from optimal regulation. Thus, based on their model, one would expect children who are high in the dispositional tendency to perform prosocial actions (i.e., those viewed as having a prosocial personality) to be well regulated and constructive copers, high in social skills and popularity, and low in the dispositional tendency to experience negative emotions.

There is very little empirical research directly testing the relation of prosocial behavior to individual differences in emotionality and regulation. A limited amount of research suggests that positive affect rather than negative emotionality has been correlated with prosocial behavior. However, most of the relevant studies have concerned emotional

		<u>Style of Regulation</u>		
		<u>Highly Inhibited</u> (high inhibitory control; low activational control; underutilization of adaptive attentional, social communicative, and other mechanisms)	<u>Optimal Regulation</u> (moderate use of inhibitory control; relatively high use of activational control; attentional and social communicative mechanisms, planning, and problem-focused coping; flexible use of self-regulatory mechanisms)	<u>Under-Regulation</u> (low in inhibition; underutilization of adaptive attentional, activational control, problem-focused or emotion-focused mechanisms)
<u>Emotional Intensity</u> (disregarding valence)	Moderately High	Inhibited Expressive at a young age but learns to inhibit overt expressions of emotion Shy Low to average social skills Prone to reactive (emotion-induced) withdrawal Lack of flexibility in coping Prone to anxiety, fear, and personal distress	Expressive Interpersonally engaging Sociable Socially competent and popular Constructive coping behaviors Resilient Prone to sympathy and spontaneous prosocial behavior Prone to high levels of positive emotion	Uncontrolled, active behavior Social or extroverted Frequently controversial or rejected children (particularly boys) Nonconstructive ways of coping with emotion Prone to reactive aggression Low in prosocial behavior Prone to personal distress, frustration, and negative affectivity
	Moderately Low	Inhibited and passive Highly controlled Nonexpressive Unsociable or introverted Prone to proactive withdrawal Low to average social skills and popularity Lack of flexibility in coping Somewhat flat affect	Placid Average expressiveness Sociable Socially competent and popular Constructive coping behaviors Resilient Moderately high in prosocial behavior and sympathy Prone to positive emotion	Erratic behavior Extroverted and sensation-seeking Low to average popularity Often nonconstructive coping Prone to proactive aggression and manipulative behavior Low in prosocial behavior and vicarious emotional responding

FIG. 1.—The interaction of self-regulation and emotional reactivity: hypothesized correlates

states while performing specific prosocial acts rather than dispositional or temperamental differences in the tendency to experience positive or negative emotion (Denham, 1986; Denham, McKinley, Couchoud, & Holt, 1990; Lennon & Eisenberg, 1987; Zahn-Waxler, Friedman, & Cummings, 1983). There also is limited empirical research consistent with the view that prosocial children are well regulated; for example, prosocial behavior has been linked to the ability to delay gratification (Block & Block, 1973; Long & Lerner, 1974), whereas low generosity among preschoolers has been associated with children being restless and fidgety, aggressive, overreacting to frustration, and behaving in immature and rattled ways when stressed (Block & Block, 1973). Further, sympathetic responding (which often is associated with prosocial behavior; Eisenberg & Fabes, 1990) has been correlated with temperamental regulation (including attentional control) and low negative emotionality in children (Eisenberg et al., in press). In contrast, dispositional negative emotionality (particularly intensity of negative emotions) has been positively associated with sympathy among adults (Eisenberg, Fabes, Murphy, Karbon, et al., 1994; Eisenberg & Okun, in press). Because negative emotionality and regulation appear to have some temperamental basis (e.g., Emde et al., 1992; Plomin & Stocker, 1989; Rothbart & Derryberry, 1981), relations of prosocial behavior with these aspects of functioning might be expected to exist from a relatively early age. In fact, early temperamental emotionality has been linked to constructs related to prosocial behavior such as empathy and guilt when children are aged 6 to 7 years (Rothbart, Ahadi, & Hershey, 1994).

In regard to social competence, there is some evidence indicating that prosocial children (or children who act prosocially in a given context) tend to be popular with their peers (see Coie, Dodge, & Kupersmidt, 1990; Dekovic & Janssens, 1992; Hampson, 1984; Raviv, Bar-Tal, Ayalon, & Raviv, 1980) and relatively sociable (Eisenberg, Cameron, Tryon, & Dodez, 1981; Eisenberg, Pasternack, Cameron, & Tryon, 1984; Stanhope, Bell, & Parker-Cohen, 1987; Suda & Fouts, 1980). In a recent study, comforting of an infant was linked to constructive coping skills such as instrumental coping (rather than avoidance or aggressive coping), which could be considered evidence of socially competent functioning and/

or regulation (Fabes, Eisenberg, Karbon, Troyer, & Switzer, 1994). In a few studies, prosocial behavior also has been linked to measures of socioemotional adjustment such as self-esteem (Larrieu & Mussen, 1986). However, problems in socioemotional adjustment are not consistently negatively related to level of prosocial development in children (Bond & Phillips, 1971; O'Connor, Dollinger, Kennedy, & Pelletier-Smetko, 1979). Individuals with socioemotional problems may engage in prosocial behavior for different reasons than do well-adjusted individuals. For example, anxious/inhibited children often may assist in an effort to ingratiate or as an overreaction to social distress (O'Connor et al., 1979).

Eisenberg and Fabes's (1992) model suggests that not only will there be an association of dispositional regulation with prosocial responding, but also that this relation may be moderated by dispositional emotionality. From the model, one could infer that prosocial behavior would be lowest in children low in regulation and high in negative (rather than positive) dispositional emotionality. In fact, individuals high in negative emotionality and low in regulation do exhibit low levels of social status and social skills (Eisenberg et al., 1993) and, to some degree, low levels of sympathy in childhood (Eisenberg et al., in press), as well as high levels of criminality (Caspi et al., 1994). However, there is little, if any, research on the additive and interactive effects of individual differences in regulation and emotionality on prosocial functioning.

In the present study, dispositional prosocial behavior was assessed with peers' nominations. Similar procedures have been used successfully in previous studies (e.g., Dlugokinski & Firestone, 1973; Hoffman & Saltzstein, 1967; Larrieu & Mussen, 1986). Although nominations of prosocial behavior seem to be a reasonable way to tap children's dispositional prosocial behavior, it is possible that peers' nominations of prosocial behavior reflect, in part, children's liking of their peers, regardless of peers' actual prosocial tendencies. Of course, because cooperative and prosocial children are likely to be better liked by peers (e.g., Coie et al., 1990; Dekovic & Janssens, 1992), it is difficult to know whether relations between peers' assessments of prosocial behavior and peer acceptance are real or an artifact of children simply nominating their friends as being prosocial. Nonetheless, children's social acceptance

by peers also was assessed in the present study so that it could be controlled in auxiliary analyses.

Participants in this study spanned the mid-elementary school years, a time of rapid sociocognitive development (Shantz, 1983). Because older children are more likely to judge one another based on dispositional characteristics than are younger children (Hartup, 1983; Rotenberg, 1982), one might expect associations between peers' reports of children's prosocial behavior and aspects of dispositional functioning to increase with age. This possibility was examined with moderational analyses.

To decrease problems related to reporter bias, in the present study children's dispositional negative emotionality, regulation, and social functioning were measured with multiple measures obtained from multiple reporters. Further, because concerns about social desirability can influence self-reported vicarious emotional reactions and mothers' reports of their children's temperament and social behavior, children's and mothers' social desirability were assessed. In addition to questionnaire measures of regulation, vagal tone was assessed. Vagal tone, a measure derived from heart rate, is viewed as a marker of dispositional physiological regulation and is highly related to heart-rate variability (HRV; Izard et al., 1991). In infancy, high vagal tone has been related with reactivity to frustrating and distressing stimuli, and distractibility (DiPietro, Larson, & Porges, 1987; Fox, 1989). However, after early infancy, vagal tone and/or heart-rate variability have been associated with uninhibited and assertive behavior, sociability, expressiveness, the ability to deal with new situations (Fox, 1989; Fox & Field, 1989; see Reznick, 1989), sympathy (Fabes, Eisenberg, & Eisenbud, 1993), and sustained attention (Suess, Porges, & Plude, 1994). Moreover, kindergartners' and second graders' HR variability was positively related to boys' use of a comforting versus irritated tone of voice when comforting a crying infant and to quantity of girls' comforting behavior (Fabes et al., 1994).

However, in a recent study with 6–8-year-olds, Eisenberg et al. (1995) found that vagal tone was positively related to boys' social functioning, constructive coping, and low negative emotionality, whereas findings tended to be reversed for girls (particularly for teacher-report measures). The authors hypothesized that uninhibited, assertive girls and boys are viewed differently at school and come to view themselves differently. Based on these data, one might ex-

pect vagal tone to be positively related to boys' prosocial behavior and negatively related to girls' prosocial behavior.

Method

SUBJECTS

Participants were 151 children recruited from three local elementary schools, 67 girls (M age = 120 months, SD = 13) and 84 boys (M age = 124 months, SD = 13). Children were in third (23%; 18 girls, 16 boys), fourth (32%; 22 girls, 27 boys), fifth (25%; 15 girls, 23 boys), or sixth (20%; 12 girls, 18 boys) grade and ranged in age from 98 months to 155 months (M age = 122.28 months, SD = 13.39). Approximately 89% of the children were Caucasian; 4% were Black, 3% were Hispanic, and 2% were Asian or Native American. Mean years of maternal and paternal education were 14.86 (SD = 2.22; range = 8 to 20 years) and 15.62 (SD = 2.42; range = 10 to 20 years), respectively. Family income ranged from \$4,000 to \$100,000 (M = \$49,143, SD = 19,733; median = \$48,000). Seventy-three percent of the children came from homes with two parents living in the home.

MEASURES

Near the end of the school semester, children engaged in a sociometric task in which they nominated those peers who were most prosocial and provided sociometric ratings of peers. Children also completed questionnaire measures of social functioning and social desirability during the laboratory session; during the same session, heart-rate data were collected to compute vagal tone (viewed as an index of physiological regulation). In addition, measures of children's temperamental emotionality and regulation, coping, social functioning, and social desirability were administered to parents (in all but five cases the mother was the primary respondent). Fathers (n = 97; 81% of available fathers) completed the children's temperament measure tapping negative emotionality and attentional regulation. Mothers usually completed the questionnaires in the laboratory, and the father questionnaires were taken home by the mother or sent by mail. Toward the end of the semester, teachers completed measures pertaining to children's coping, social functioning, negative emotionality, and regulation (n s for variables ranged from 139 to 151).

Prosocial Nominations

Near the end of the study, children participated in a nomination procedure in which they were asked to pick classmates who were most prosocial. Specifically, they were asked, "Who in your class is the person most likely to go up and offer to help or share with other kids without being asked—someone who is really nice to other kids in the class?" After children had nominated one classmate, children were asked if there was anyone else (a maximum of two nominations were obtained). Following this procedure, children were thanked and given a small prize.

Seventy-two percent of girls and 36% of boys received at least one nomination for prosocial behavior. To obtain a score of prosocial nominations, the total number of times each child was nominated first by same-sex classmates was multiplied by 2 and added to the number of second nominations by same-sex classmates. This sum was divided by the number of same-sex classmates that participated in the nomination procedure (M number of same-sex classmates = 6.14). A similar procedure was conducted for opposite-sex nominations (M number of opposite-sex classmates = 6.52). The same-sex average and the opposite-sex average were then averaged to form one *prosocial nomination* score (M number of raters = 12.67, SD = 3.38, range = 5 to 18). Weighing same-sex and other-sex nominations equally controlled for bias if there were more raters of one sex than another. This composite score was used in the analyses because measures generally are more reliable if scores from multiple raters are aggregated (Epstein, 1979; Rushton, Brainerd, & Pressley, 1983).

Measures of Temperamental Emotionality and Regulation

Temperamental negative emotionality.— Mothers, fathers, and teachers completed items adapted from Derryberry and Rothbart's (1988) temperament measure to assess aspects of dispositional emotionality, as well as regulation. Respondents rated how true the items were for the child on a 7-point scale (from "extremely untrue" to "extremely true"). Measures of emotionality included autonomic reactivity (four items; e.g., "My [this] child's palms usually sweat during an important event"), fear (five items; e.g., "My [this] child often worries about things that turn out to be unimportant"), and sadness (five items;

e.g., "My [this] child frequently misses friends, family, or teachers"). Because sadness, fear, and autonomic reactivity items often were significantly correlated and all represented negative emotion, items from the scales were combined to form a 14-item negative arousal composite score (alphas = .68, .68, and .73 for mothers, fathers, and teachers, respectively).

Mothers, fathers, and teachers also rated children's emotional intensity with seven items adapted from Larsen and Diener's (1987) Affective Intensity Scale (see Eisenberg et al., 1993). Each statement was rated as to how true (from 1 = *extremely untrue* to 7 = *extremely true*) it was for the child (e.g., "My [this] child responds very emotionally to things around him/her"). Alphas for mothers, fathers, and teachers were .72, .73, and .72, respectively. This scale was positively correlated with the negative arousal composite (r s ranged from .50 to .55, p s < .001, for mothers, fathers, and teachers); thus, the emotional intensity scale and the negative emotionality composite were averaged to compute a negative emotionality composite. Further, because maternal and paternal composite measures of negative emotionality were positively related, $r(89) = .33$, $p < .001$, they were averaged when both parents responded to form a more reliable index (Rushton et al., 1983). Scores from one reporter were used when the other reporter did not respond. Teacher scores of negative emotionality were not significantly correlated with those for parents and were kept separate.

Temperamental regulation (questionnaire data).— Temperamental attentional regulation was assessed with additional items adapted from Derryberry and Rothbart's (1988) temperament measure pertaining to: (a) attention shifting (four items; e.g., "If my [this] child doesn't want to deal with a problem, he/she can easily shift his/her attention away from it"), and (b) attention focusing (four items; e.g., "My [this] child is hard to distract when involved in a task"). Because attention shifting and attention focusing were conceptually linked and positively correlated, r s (146, 91, 136) = .51, .45, and .57, p s < .001, for mothers, fathers, and teachers, respectively, an *attentional control* composite was formed using items from both scales. Alphas (after dropping one item from attention shifting) were .71, .65, and .82, for mothers, fathers, and teachers, respectively.

Mothers' attentional control scores were significantly related to those of teachers, $r(136) = .53$, $p < .001$, and both mothers' and teachers' scores were

correlated with fathers' scores, $r_s(89) = .36$ and $.26$, $p_s < .001$ and $.013$. Thus, mothers', fathers', and teachers' scores were averaged (two of the three scores were needed to compute the composite); this composite index of attentional control was used in all subsequent analyses.

Vagal tone.—Vagal tone, a marker of emotional regulation (Porges, Doussard-Roosevelt, & Maiti, 1994), reflects the magnitude of variability in heart rate (HR) due to respiratory sinus arrhythmia. Heart-rate data to compute vagal tone were collected while children viewed a relatively neutral film. This 145-sec film segment was part of a meditation film depicting dolphins swimming peacefully in the ocean to calm music (Bugental, Blue, Cortez, & Rodriguez, 1992). Vagal tone was computed with Porges's (1985) software using 125 sec (all but the first 15 and last 5 sec) of data from a relatively neutral film.

The HR data used to compute vagal tone were collected with a Colbourne impedance pneumograph coupler (S73-22) and recorded on line into a computer. The HR samples (collected every 10 msec) were then used to calculate mean HR per $\frac{1}{2}$ -sec period. When there was artifact in the data due to a child's movement (which occurred relatively infrequently), the average of the one codable beat immediately before and after the artifact was used in place of the uncodable data points. Vagal tone was computed from the interbeat intervals using a bandpass setting of $.24$ to 1.04 and a sample period of 250 .

Social Functioning

Adults' reports of socially appropriate behavior and popularity.—To assess children's socially appropriate behavior, mothers and teachers completed seven items adapted from Harter's (1979) Perceived Competence Scale for Children (e.g., "My [this] child usually acts appropriately" vs. "My [this] child usually does not act appropriately" [reversed]; see Eisenberg et al., 1993). Respondents used Harter's 4-point response scale (i.e., selected the statement that best described the child and then indicated if the item was "really true" or "sort of true"). Alphas for mothers and teachers were $.81$ and $.92$, respectively. Teacher and parent scores were significantly related, $r(141) = .50$, $p < .001$, and were averaged. High scores indicated more appropriate behavior. As part of the measure of social skills, teachers and mothers also rated three items pertaining to children's popularity (e.g.,

"My [this] child has a lot of friends" vs. "My [this] child doesn't have many friends" [reversed]; alphas = $.85$ for mothers and $.93$ for teachers). Parents' and teachers' ratings were significantly correlated, $r(133) = .40$, $p < .001$, and were averaged to create a more reliable composite measure.

Children's report of socially appropriate behavior.—Children also completed social skills items similar to those administered to teachers and parents. They rated how much each of six items was like them (from 1 = really not like me to 4 = really like me; e.g., "I usually do what I am supposed to do," "I often get in arguments with other children" [reversed]; alpha = $.63$).

Peer acceptance.—A sociometric rating procedure was used to obtain peers' reports of social acceptance; it was administered at the same time as the nominations of prosocial behavior (see above for details). Children were asked how much they played with or liked to be with a particular classmate. A 5-point rating scale was used (5 = "you play with this child a lot—he or she is like a best friend," 4 = "you play with him or her quite a bit," 3 = "you play with the child a little bit," 2 = "you do not play together, but simply because this child is just forgotten or doesn't get much attention from other children," and 1 = "you do not play together because you don't want to"). After an example, children rated an average of 12 classmates who were participants in the study (range, 4 to 19; some children had permission for the sociometric task but did not participate in the rest of the study). Mean ratings received from same- and other-sex peers were computed, and then the mean same-sex ratings and mean opposite-sex ratings were averaged to obtain a *peer acceptance score* (this was done to control for different numbers of male and female raters; sometimes the n was small for standardization within class). Ratings were missing for five children, primarily because they were late in getting involved in the study.

Coping Styles

To assess children's coping styles, mothers and teachers completed an adaptation of the Children's Coping Strategies Checklist (Program for Prevention Research, 1992). On a scale of 1 (never) to 5 (very often), respondents rated how often the child "generally does" various types of behaviors when faced with a problem. Mothers rated different types of coping behavior. Several scales were ones that have usu-

ally been considered as relatively constructive coping (e.g., Carver, Scheier, & Weintraub, 1989; Eisenberg et al., 1993; Sandler, Tein, & West, 1994); these were utilized in the present study. The chosen scales were as follows: (a) positive cognitive restructuring (thinking about the problem in a more positive way, minimizing the problem or the consequences of the problem; five items; $\alpha = .78$), (b) cognitive decision making (planning or thinking about ways to solve the problem; four items; $\alpha = .72$), (c) direct problem solving (efforts to improve the problem situation; five items; $\alpha = .81$), (d) problem-focused support (involving other people as resources to assist in seeking solutions to the problem; seven items; $\alpha = .86$ after dropping one item relating to crying), (e) emotion-focused support (involving other people in listening to the child's feelings about the problem or providing understanding to help the child to be less upset; six items; $\alpha = .76$ after dropping one item relating to crying), and (f) seeking understanding (efforts to find meaning in a problem situation or trying to understand it better; one item).

Although the parents' and teachers' measures were similar, teachers rated fewer items than mothers. Teachers rated positive cognitive restructuring (five items; $\alpha = .83$), cognitive decision making (three items; $\alpha = .89$), direct problem solving (five items; $\alpha = .91$), problem-focused support (six items; $\alpha = .94$ after dropping one item relating to crying), emotion-focused support (five items; $\alpha = .91$ after dropping one item relating to crying), and seeking understanding (one item).

Several of the scales were significantly interrelated and conceptually linked. Thus, the following composites were formed: (1) seeking support—emotion-focused and problem-focused support (for parents and teachers, $r[145, 137] = .78$ and $.92$, $ps < .001$), and (2) problem solving—direct problem solving, cognitive decision making, and seeking understanding; rs among these scales ranged from $.56$ to $.59$ for parents and from $.74$ to $.82$ for teachers, $ps < .001$,

For parents, these two coping composites and positive cognitive restructuring were significantly intercorrelated (rs ranged from $.26$ to $.54$, with two of the three correlations above $.52$, all $ps < .001$) and loaded highly on a single factor when a varimax factor analysis was computed. Thus, the three composites were standardized and averaged. Similarly, the three analogous composites for teachers were positively related,

$rs = .69$ to $.78$, $ps < .001$, and loaded on a single factor; consequently, they were standardized and averaged. Teacher and parent scores on this new composite were positively related, $r(149) = .50$, $p < .001$, and were averaged.

Further, the combined teacher/parent coping composite score was positively correlated with the teacher/parent composite scores for socially appropriate behavior, $r(149) = .62$, $p < .001$. Therefore, scores for socially appropriate behavior and the coping composite were averaged (henceforth also labeled *constructive social skills*).

Social Desirability

Because questionnaire responses may be affected by the desire to behave in a socially approved manner, children and mothers completed self-report measures of social desirability. Mothers completed 22 true/false items from the Marlowe-Crowne (Crowne & Marlowe, 1964) and children were administered 14 yes/no items (Crandall, Crandall, & Katkovsky, 1965). The alphas for mothers and children were $.73$ and $.80$, respectively.

PROCEDURE

Each child and a parent came to the laboratory and were met by two experimenters (one the same sex as the child and the other a female who worked with the mother). After establishing rapport and obtaining the necessary permission, mother and child were told that the child would be watching some videotapes and answering some questions. The physiological hookup was explained at this time.

The mother and child were taken into the experimental room and two pre-jelled electrocardiograph electrodes were placed on the child's front ribs, near their sides; a third electrode (a ground) was placed on the back. The electrodes were linked to a Colbourne unit as well as to a computer and Crass physiograph (all in the adjacent room). Children were told that the equipment was very sensitive to movement, and a velcro strap was placed loosely around the child's arm as a reminder to remain as still as possible while watching the tapes.

The mother was then taken into another room and administered the questionnaires. At this time, the child completed the questionnaire measure of socially appropriate behavior. Then, approximately 20 min after the child arrived, the child viewed

the meditation film (which was introduced as a film about dolphins). The child was left alone at this time. During the film, the child’s heart rate (HR) was monitored. After some procedures not relevant to this article, children completed a social desirability scale, were probed for suspicion, debriefed, and given \$5.00 (\$10 if the mother gave her portion to the child) and a small prize.

Results

DESCRIPTIVE ANALYSES

The prosocial nomination data were transformed with a natural log transformation to improve the normality of the variable’s distribution (after adding 1 to scores). This measure was used in all analyses. However, when presenting means and mapping interactions, raw scores were used to increase interpretability of the scores. The results of analyses using the transformed and nontransformed data were extremely similar.

Relations with Age, Sex, and Social Desirability

In initial correlations, the relations of the major variables with age, sex, and social desirability were examined. Age was significantly negatively correlated with children’s reports of socially appropriate behavior, $r(149) = -.18, p < .029$. In addition, for boys only, age was negatively related to nominations of prosocial behavior, $r(82) = -.23, p < .036$, and positively related to teachers’ reports of negative emotionality, $rs(74) = .26, p < .026$. There also were nu-

merous sex differences. Girls were higher on prosocial nominations than were boys, $t(149) = 5.23, p < .001$; were rated as better liked by peers, $t(144) = 2.36, p < .001$; and were viewed by adults as higher in regulation, constructive social skills, and popularity, $ts(148,149,149) = 3.42, 6.29, \text{ and } 2.40, ps < .001, .001, .017$ (see Table 1 for means). Because of the numerous sex differences and some differences in the patterns of findings for boys and girls, the data generally are presented separately for boys and girls.

Children’s social desirability scores were positively related to their self-reported social skills, $r(149) = .43, p < .001$ (this relation was highly significant for both sexes). Mothers’ reports of social desirability were unrelated to their scores for variables used in the analyses. Given the small number of correlations for social desirability, it is not discussed further.

The Relation of Peers’ Nominations of Prosocial Behavior to Temperamental Emotionality and Regulation

In several sets of analyses, we examined (a) the correlational relations of peer nominations of prosocial behavior to temperament measures of emotionality and regulation, (b) whether these correlations were significant when the effects of peers’ ratings of liking were partialled from the correlations, (c) if age moderated the relations between prosocial nominations and rated emotionality/regulation, (d) the percent of variance in prosocial nominations accounted for by the three measures of rated emotionality/

TABLE 1
MEANS AND STANDARD DEVIATIONS FOR THE MAJOR VARIABLES

MEASURES	GIRLS		BOYS	
	M	SD	M	SD
Prosocial nominations ^a .....	.23	.27	.07	.12
Peer ratings of social status	2.64	.56	2.41	.58
Reports of negative emotionality:				
Parents	4.26	.64	4.19	.64
Teachers	4.11	.62	4.14	.71
Parent/teacher reported regulation (attentional control)	4.45	.80	3.98	.86
Parent/teacher reports of constructive social skills .....	.39	.62	-.32	.73
Self-reported socially appropriate behavior	3.10	.48	2.80	.56
Parent/teacher reports of popularity ..	3.25	.65	2.99	.67

^a This is the mean prior to transforming nomination scores (see text).

regulation, and (e) whether rated negative emotionality and regulation interacted in predicting prosocial nominations.

Correlations.—Prosocial nominations were related to measures of both emotionality and regulation, but the relations differed somewhat by sex. Specifically, mother/father reports of negative emotionality were negatively related to prosocial nominations for girls, whereas teachers' reports of negative emotionality were negatively related for boys. Further, for boys, adults' reports of high regulation were positively correlated with prosocial nominations (see Table 2). All of these correlations were significant at $p < .01$ or higher; thus, they were unlikely to be due to chance. Controlling age had relatively little effect on the correlations.¹

Peers' prosocial nominations were moderately correlated with peers' ratings of peer acceptance, $r(144) = .38, p < .001$.² To determine the degree to which relations between peers' nominations of prosocial behavior and emotionality/regulation might be due to children's tendencies to rate peers as prosocial due to their liking of the given peer, in auxiliary partial correlations we controlled for the effects of peer ratings of liking. These partial correlations were conservative because it is likely that prosocial children are those that tend to be better liked by peers (Coie, Dodge, & Kupersmidt, 1990). As can be seen in Table 2, the pattern of findings was unchanged when peer sociometric ratings were partialled from the correlations. Further, controlling for maternal or paternal education had little effect on the correlations.

The moderating effect of age.—In regression analyses, we examined whether any of the aforementioned relations varied with age. After centering the data for the predictors (i.e., subtracting the mean for a variable from the variable; Aiken & West, 1991), the main effects of age and a given predictor were entered in the first step; the age \times predictor interaction term was entered in the second step. Because the aforementioned correlations for regulation and emotionality varied by sex, separate regressions were pre-

sented for boys and girls.

One of the six regression equations was significant. For girls, the interaction between age and parents' reports of negative emotionality was significant, $F(1, 63) = 6.30, p < .015, R^2 \text{ change} = .08$. The nature of the interaction was examined in the manner recommended by Aiken and West (1991). Their procedures involve calculating regression equations at exemplar high, medium, and low values of one variable (i.e., the mean and values 1 *SD* below and above the mean for the variable) for high, medium, and low values of the other continuous variable. The negative relation between negative emotionality and girls' prosocial nominations was stronger at older ages, $ts(63) = -2.72$ and $-3.97, ps < .01$, for the slopes at moderate and higher ages (see Fig. 2). There were no moderating effects of age for parents' reports of girls' negative emotionality or adults' reports of girls' or boys' regulation. Given the limited number of findings in regard to the moderating effect of age, the one significant finding may not be reliable.

The additive predictive power of temperamental ratings.—In additional regression analyses, we examined the prediction of prosocial nominations from adults' reports of temperamental emotionality and regulation. Regressions were computed with and without entering peers' ratings of liking prior to other predictors.

Regression equations including measures of emotionality and regulation were computed separately by sex (because of the aforementioned sex differences in the pattern of correlational findings). The combination of teacher- and parent-reported negative emotionality and teacher/parent-reported regulation predicted 12% and 18% of the variance in prosocial nominations for girls and boys, respectively (see Table 3). The beta for parents' reports of negative emotionality was significant for girls; both regulation and teachers' reports of negative emotionality provided independent prediction for boys (see Table 3). The findings changed little when age was controlled. When the effects of peers' ratings of liking were entered in the first step, the change in R^2 produced by entering

¹ In addition, the pattern of findings was very similar, albeit sometimes a bit weaker, when separate correlations were computed for same- and other-sex raters.

² Children also made first, second, and third choices in regard to which peers they liked most. A composite index for liking nominations was computed in a manner analogous to that used to compute helping nominations. The correlation between this liking nomination score and helping nominations was $r(149) = .33, p < .001$.

the three measures of emotionality/regulation on the second step was still marginally significant for girls, $F(4, 55) = 2.32, p < .086, R^2$ change = .10, and significant for boys, $F(3, 69) = 4.94, p < .004, R^2$ change = .16. Thus, temperamental emotionality and regulation, as rated by adults, predicted a moderate amount of variance in prosocial nominations, and controlling for peers' liking of peers did not eliminate the associations, particularly for boys.

The interaction of regulation and negative emotionality in predicting prosocial nominations.—Additional regression analyses were computed to determine whether there was an interaction between negative emotionality and regulation when predicting prosocial nominations. Separate analyses were computed for parents' reports of both negative emotionality and regulation and teachers' reports of these two variables. The main effects of negative emotionality and regulation (i.e., attentional control) were entered on the first step; the interaction term for the two was entered on the second step. Consistent with the correlational analyses, there was evidence of moderation for girls when considering parents' reports of negative emotionality; for boys, moderation was evident only for the teacher-report data.

Two of the four regression equations computed were significant at $p < .057$ or better. For girls, the addition of the multiplicative interaction term was marginally significant, $F(1, 61) = 3.77, p < .056$. This interaction was significant at $p < .048$ for the entire sample, but most of the effect was for girls. The increase in prediction was over 5% (see Table 4). The interaction was mapped using Aiken and West's (1991) procedures. Girls high in regulation were high in prosocial nominations regardless of level of emotionality. However, for girls who were low or moderate in regulation, prosocial nominations were higher if negative emotionality was lower, $ts(61)$ for slopes = $-2.82, -2.30,$ and $-.13, ps < .01, .05,$ and N.S., for low, moderate, and high regulation groups (see Fig. 3).

For boys, there was an interaction between teachers' ratings of negative emotionality and regulation, change in $R^2 = .05$ (see Table 4). For boys low in regulation, prosocial nominations were low regardless of level of negative emotionality. At high and moderate levels of regulation, boys with higher negative emotionality received lower prosocial nomination scores, $ts(72)$ for slopes = -2.90 and $-2.11, ps < .01$ and $.05,$ respectively (see Fig. 4).

TABLE 2

CORRELATIONS OF PEER NOMINATIONS OF PROSOCIAL BEHAVIOR WITH MEASURES OF NEGATIVE EMOTIONALITY, REGULATION, AND SOCIAL FUNCTIONING: ZERO-ORDER CORRELATIONS AND PARTIAL CORRELATIONS CONTROLLING SOCIOMETRIC RATINGS (in Parentheses)

Measures	Girls	Boys
Measures of emotionality/regulation:		
Parent negative emotionality	-.35** (-.31)*	-.08 (-.14)
Teacher negative emotionality	-.02 (-.07)	-.30** (-.28)*
Parent/teacher regulation .....	.18 (.04)	.36*** (.34)**
Vagal tone	-.23 (-.25)*	-.07 (-.15)
Measures of social functioning:		
Parent/teacher constructive social skills .....	.45*** (.36)**	.43*** (.40)**
Child reported socially appropriate behavior .....	.45** (.39)**	.22* (.24)*
Parent/teacher popularity .....	.30* (.17)	.24* (.08)

* $p < .05$.
 ** $p < .01$.
 *** $p < .001$.

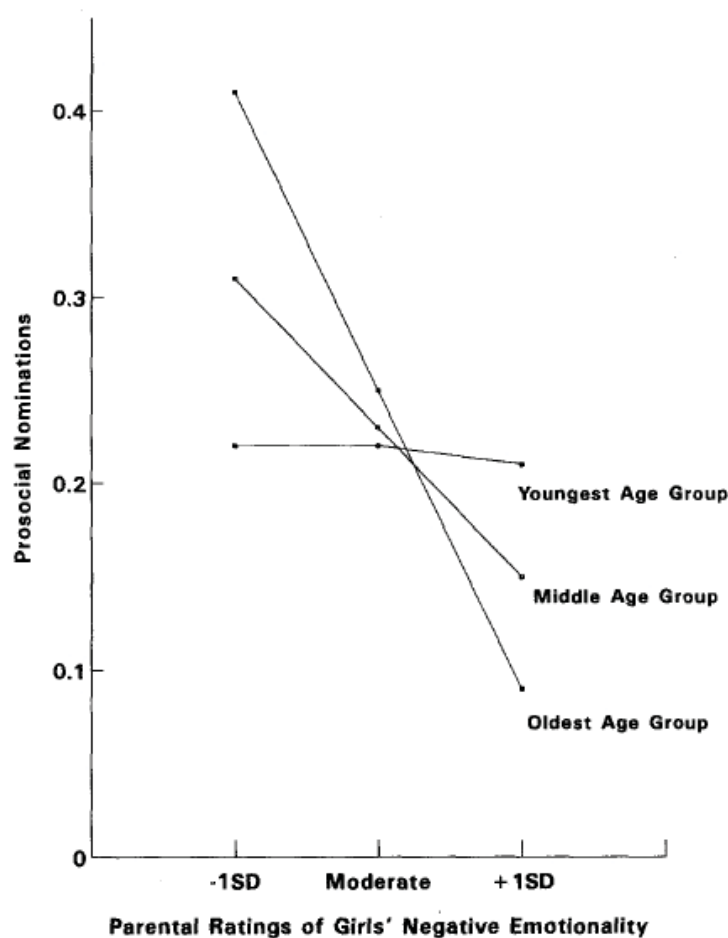


FIG. 2.—The interaction of parents' ratings of girls' negative emotionality with age in predicting prosocial nominations.

TABLE 3

THE ADDITIVE EFFECTS OF MEASURES OF NEGATIVE EMOTIONALITY/REGULATION OR SOCIAL FUNCTIONING ON PROSOCIAL NOMINATIONS: REGRESSION EQUATIONS

	GIRLS		BOYS	
	R ² Change	Beta	R ² Change	Beta
Emotionality/regulation .....	.12		.18	
Teacher emotionality .....		.03		-.26*
Parent emotionality		-.32*		.07
Regulation (attentional control) .....		.12		.33**
Multiple R .....	.37		.43	
F for analysis	$F(3, 58) = 2.71^*$		$F(3, 72) = 5.34^{**}$	
Social functioning .....	.31		.19	
Constructive social skills .....		.33*		.35**
Child-report socially appropriate behavior .....		.34**		.08
Parent/teacher popularity .....		.04		.10
Multiple R .....	.56		.44	
F for analysis	$F(3, 63) = 9.48^{****}$		$F(3, 80) = 6.42^{***}$	

NOTE.—Measures of emotionality and regulation are parental reports for girls (primarily mothers) and teachers' reports of boys.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

**** $p < .0001$.

TABLE 4

INTERACTIONS OF MEASURES OF NEGATIVE EMOTIONALITY AND REGULATION: REGRESSION EQUATIONS

	GIRLS		BOYS	
	R ² Change	Beta	R ² Change	Beta
Step 1: Main effects .....	.08		.21	
Negative emotionality		-.25*		-.21 ⁺
Regulation (attentional control) .....		.10		.36**
F for step	$F(2, 62) = 2.66^+$		$F(2, 73) = 9.61^{***}$	
Step 2: Interaction .....	.05	.24 ⁺	.05	-.22*
Multiple R .....	.36		.51	
F for step	$F(1, 61) = 3.77^{a+}$		$F(1, 72) = 4.68^*$	

NOTE.—Measures of emotionality and regulation are parental reports for girls (primarily mothers) and teachers' reports of boys.

- ^a $p < .057$.
- ⁺ $p < .10$.
- * $p < .05$.
- ** $p < .01$.
- *** $p < .001$.

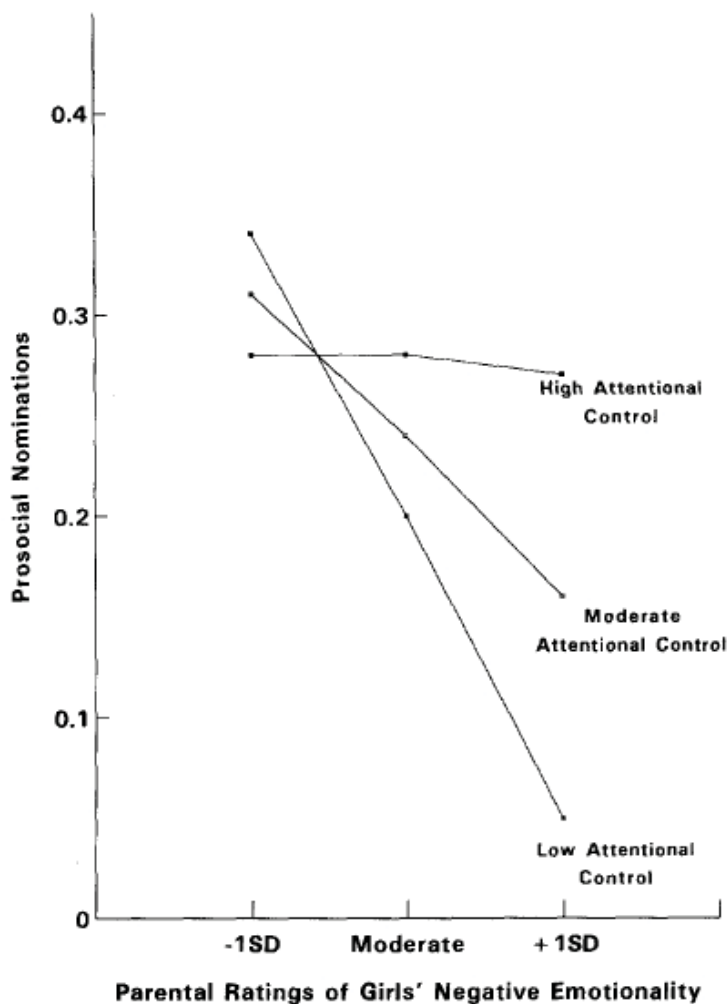


FIG. 3.—The interaction of girls' negative emotionality with regulation in predicting prosocial nominations: Parent reports.

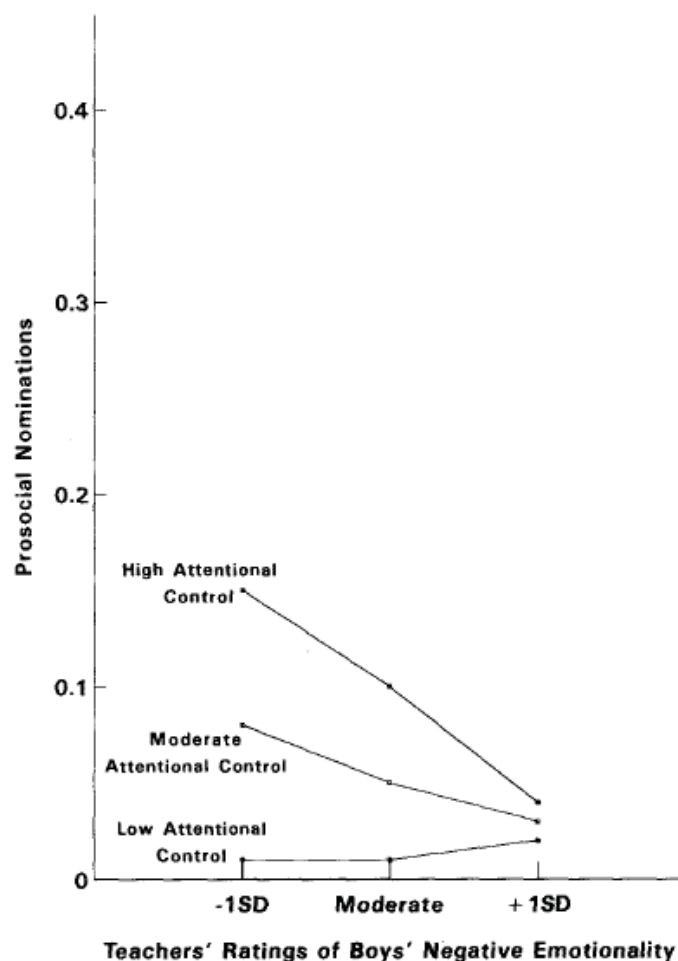


FIG. 4.—The interaction of boys' negative emotionality with regulation in predicting prosocial nominations: Teacher reports.

Vagal tone.—Vagal tone was negatively related to prosocial nominations, $r(149) = -.18, p < .025$, for the total sample. When ratings of liking were partialled from the correlation, the correlations were significant for both the total sample and girls, partial $r_s(143$ and $62) = -.19$ and $-.25, p_s < .02$ and $.043$ (see Table 2). The relation between vagal tone and prosocial nominations was not moderated by age.

The Relation of Peer Nominations of Prosocial Behavior to Social Functioning

The relations of prosocial nominations to social functioning were assessed with correlational analyses and regression equations examining the moderating effects of age and the additive predictive power of the three measures of social functioning.

Correlations.—As can be seen in Table 2, prosocial nominations were positively correlated with all

measures of social functioning (i.e., children's and adults' ratings of constructive social skills and adults' ratings of popularity). The correlations for popularity, but not for constructive social skills or self-reported socially appropriate behavior, were reduced to non-significance when scores of sociometric ratings were partialled from the correlations (see Table 2). Controlling for maternal or paternal education had little effect on the correlations.

Moderating effects of age.—Because the correlations between prosocial nominations and measures of social functioning were similar for girls and boys, regressions pertaining to the moderating effects of age were computed for the combined sample. One of the three regressions computed was significant. There was an interaction of age with adults' reports of constructive social skills, $F(1, 147) = 3.98, p < .048$ for the change in R^2 on the second step, R^2 change = .02.

According to the mapping procedures for interactions of continuous variables described by Aiken and West (1991), adults' reports of children's constructive social skills were positively related to prosocial nominations at all ages, but the relation was stronger for older than younger children, $t_s(147)$ for slopes = 6.22, 6.78, and 3.51 from the oldest to youngest group (see Fig. 5). Moderating effects of age were not found for adults' ratings of popularity or children's self-reports of socially appropriate behavior.

The additive predictive power of measures of constructive social skills and popularity.—The three measures of social functioning/coping (i.e., self-reported socially appropriate behavior, teacher/parent reports of constructive social functioning and popularity) were used as predictors of prosocial nominations in additional regression equations. As is pre-

sented in Table 3, these measures of social functioning predicted substantial percents of the variance in prosocial nominations for children of both sexes (31% for girls, 19% for boys). Both children's self-reported social skills and adults' ratings of children's constructive social skills predicted independent variance in girls' prosocial nominations; only the latter predicted boys' prosocial nominations when all variables were entered simultaneously (see betas). When peer ratings of sociometric status were entered on the first step prior to the measures of social functioning/coping, the change in R^2 for the three measures of social functioning on the second step was quite significant for both girls, $F(3, 60) = 5.90, p < .002, R^2$ change = .20, and boys, $F(3, 76) = 6.24, p < .001, R^2$ change = .17. Controlling for age had little effect on the results.

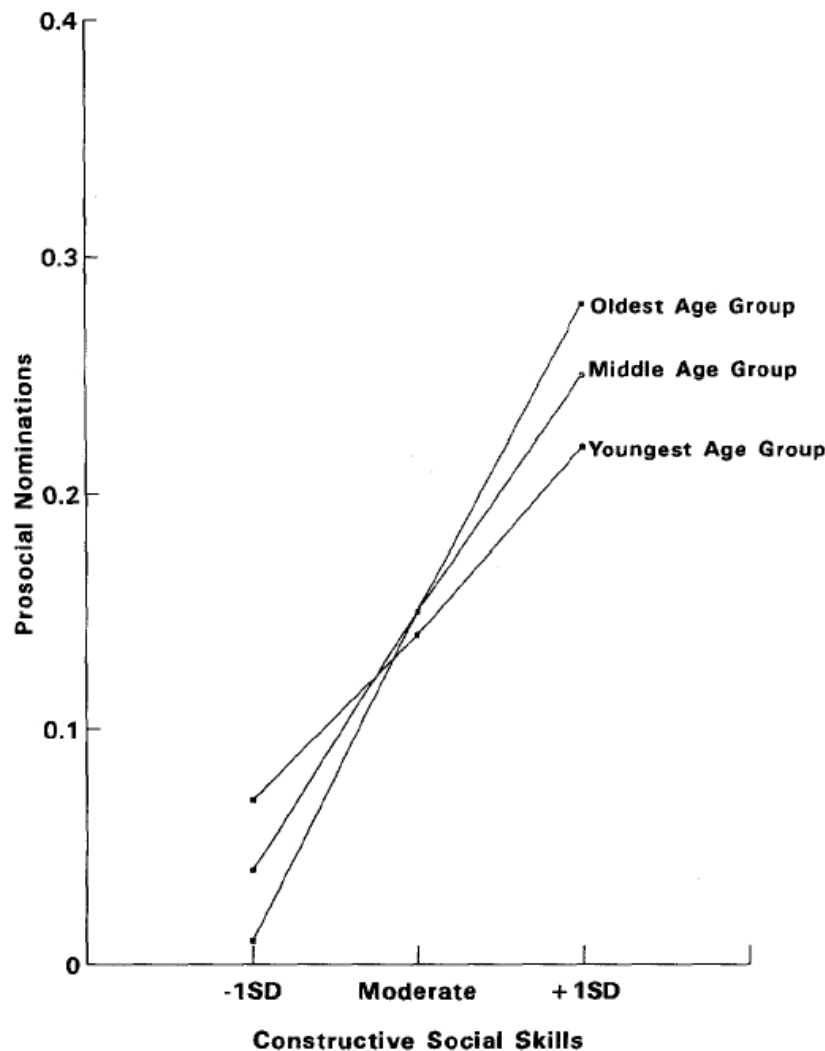


FIG. 5.—The interaction of adults' reports of constructive social skills with age in predicting prosocial nominations.

Discussion

As hypothesized, peer nominations for dispositional prosocial behavior were predicted by measures of emotionality and attentional regulation (the latter only for boys), as well as children's socially competent functioning (including socially appropriate behavior and constructive coping, as well as peer acceptance). All of the obtained relations except for the association between prosocial nominations and adults' ratings of peer acceptance were significant even when peers' liking of subjects was controlled. Moreover, the interaction of regulation with negative emotionality predicted additional variance in prosocial behavior for girls and boys, and a couple of the aforementioned relations increased in strength with age.

The findings in regard to individual differences in emotionality and regulation were, for the most part, consistent with Eisenberg and Fabes's (1992) model. However, it is interesting to note that there was a direct relation between attentional regulation and prosocial nominations only for boys. This finding is consistent with previous research in which attentional control was associated with socially competent behavior, popularity, and constructive anger reactions for boys but not girls (Eisenberg et al., 1993; Eisenberg, Fabes, Nyman, et al., 1994). As in the previous work, girls in this sample were higher in regulation than boys; thus, most girls may have attained a sufficient level of attentional regulation to enact prosocial behavior on a continuing basis. In contrast, more boys may have lacked the minimal level of regulation necessary for enacting prosocial behaviors on an ongoing basis.

Despite the fact that attentional regulation was significantly correlated with prosocial nominations only for boys, dispositional negative emotionality and attentional regulation interacted in their effects on prosocial nominations for both sexes. For girls, high regulation was associated with high levels of prosocial nominations regardless of level of negative emotionality. However, for girls at moderate and low levels of regulation, prosocial nominations decreased as negative emotionality increased. For boys, low regulation was associated with low levels of prosocial nominations regardless of level of emotionality; for boys moderate or high in regulation, prosocial nominations decreased as negative emotionality increased. In this study, girls were higher in attentional regula-

tion, an aspect of regulation that has been associated with the ability to modulate negative emotion (Derbyberry & Rothbart, 1988; Rothbart et al., 1992). Although there were basic similarities of the patterns of moderation for girls and boys, the differences may be due to the range of regulation skills among girls and boys. At very high and low levels of regulation, children may tend to be high or low, respectively, in their prosocial functioning, regardless of level of negative emotionality. Girls may constitute most of the high-regulation group, whereas boys are more likely to be in the low-regulation group. Thus, highly regulated girls may be able to modulate even relatively high levels of negative emotion; in contrast, relatively regulated boys may still have some difficulty regulating emotion if they are prone to negative emotion. For children who are more moderate in regulation, individual differences in regulation appear to change with level of dispositional emotionality in predicting prosocial nominations, with children high in regulation and low in negative emotionality being the most prosocial. Further, as is discussed below, it is possible that the nature of girls' and boys' negative emotionality differs somewhat, which could influence the nature of the interaction between negative emotionality and regulation.

It is of interest that parents' reports of negative emotionality were associated with prosocial nominations for girls, whereas teachers' reports of negative emotionality were correlated with nominations for boys. Eisenberg et al. (1993) noted that teachers' ratings of negative emotionality seemed to reflect children's displays of overt negative emotion such as anger and frustration, whereas mothers' reports of children's negative emotionality did not seem to reflect such emotions to a substantial degree. Perhaps teachers, due to their limited contact with individual children and their need to deal with disruptive negative emotions, often do not pick up on, or are less attuned to, more subtle negative emotions such as fear, anxiety, or sadness. Boys display more intense anger (e.g., Eisenberg, Fabes, Nyman, et al., 1994) and sometimes have been found to vent more when angered (Fabes & Eisenberg, 1992); girls may be more likely to mask anger (Underwood, Coie, & Herbsman, 1992). Thus, teachers may be more likely to attend to boys' negative emotion than to that of girls. In contrast, parents may be particularly sensitive to emotions such as sadness and distress, which girls may

express more than boys (Brody, 1985; Fuchs & Thelen, 1988; Zeman & Garber, 1991).

The finding of an association between dispositional prosocial behavior and adults' ratings of children's constructive coping/socially appropriate behavior is consistent with assertions that prosocial children are socially competent and relatively well adjusted (Eisenberg & Mussen, 1989). The strength of the findings for the composite measure of constructive social skills is impressive given that peers rated children's prosocial behavior, whereas parents and teachers rated constructive social skills; further, children's self-reported socially appropriate behaviors were positively related to peers' nominations for dispositional prosocial behavior. We would suggest that the relation between prosocial and socially competent functioning is due to the fact that children who are dispositionally well regulated (particularly if also low in negative emotionality) are better able than other children to attend to social situations and others' needs, as well as to regulate negative emotional reactions that interfere with socially competent and prosocial functioning. Nonetheless, it is possible that popular children are simply viewed more positively by their peers and, consequently, are more likely to be nominated as prosocial, even if they do not engage in high levels of prosocial behavior. However, the fact that children's socially appropriate behavior and constructive coping were significantly associated with prosocial nominations even when peers' sociometric ratings were controlled indicates that the aforementioned explanation cannot account for much of the association between social competence and prosocial nominations. The finding that adults' ratings of children's popularity were no longer associated with prosocial nominations when peers' sociometric ratings were controlled likely is due, at least in part, to the substantial relation between peers' and adults' ratings of social acceptance, $r(144) = .46, p < .001$.

The relations of prosocial nominations to both constructive social skills and negative emotionality (as rated by parents for girls) were moderated by age. In both cases, the linkage appeared to increase with age of the child. As children become more attuned to the dispositional characteristics of children and their consistency across time, it is likely that they judge one another increasingly on the basis of personality characteristics and typical style of social behavior. However, it also is possible that children be-

come more consistent in regard to enacting (or not enacting) prosocial behavior with age, so it is easier to link dispositional characteristics/style with prosocial functioning as children age. Further, children in higher grades, due to greater exposure to peers, may have more information about peers' dispositional characteristics.

There was only one finding that, on the surface, is clearly inconsistent with the aforementioned pattern of data for peer nominations. Girls' vagal tone, viewed as a physiological marker of regulation, was negatively related to their receipt of nominations of prosocial behavior. However, this finding is consistent with Eisenberg et al.'s (1995) finding that kindergarten to second-grade girls' vagal tone was related to low levels of social functioning, regulation, and constructive coping and high negative emotionality at school (whereas the reverse was found for boys). Further, Eisenberg et al. (1995) found that high vagal tone girls reported that they were lower in sympathy, whereas the reverse was true for boys. One explanation for this pattern of findings is that uninhibited, assertive girls and boys are viewed differently by peers, teachers, and themselves. High vagal tone and HR variability have been linked to uninhibited rather than inhibited behavior (Reznick, 1989) and assertiveness when defending one's possessions and territory (unpublished data from Eisenberg et al., 1990). Perhaps, due to gender stereotypes and consequent differential expectations for boys and girls, girls' uninhibited, assertive behavior is viewed by others as indicative of low social and prosocial functioning. Consistent with this view, Stevenson-Hinde (1989) found that shy behavior in 50-month-old girls was related to positive interactions with parents and fewer negative reactions with peers, whereas shyness in same-aged boys was associated with few positive and more negative interactions. Further, Buck (1975) found that girls who clearly exhibited spontaneous emotional reactions were viewed by teachers as impulsive, dominating, and difficult to get along with (whereas this was not true for boys). Thus, it is possible that the uninhibited style of high vagal tone girls reduces their involvement in routine everyday prosocial actions or affects peers' perceptions of such helpfulness.

In summary, the results of this study support the view that everyday, dispositional prosocial behavior with peers is related to children's dispositional characteristics and general social functioning. These data

complement prior findings that highlight the role of individual differences in emotionality and regulation in social functioning (Eisenberg & Fabes, 1992; Rothbart et al., 1994), and also suggest that prosocial skills, coping, and social competence are intimately linked in development.

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