
The development of emotional and behavioral self-regulation and social competence among maltreated school-age children

ANN M. SHIELDS,^a DANTE CICCETTI,^a AND RICHARD M. RYAN^b

^a*Mt. Hope Family Center, University of Rochester; and* ^b*University of Rochester*

Abstract

Behavioral and emotional self-regulation are important aspects of competence in school-age children. Despite the apparent interrelatedness of behavioral and affective processes, empirical approaches to the development of self-regulation typically have investigated these systems separately. As a result, their relative effects upon social competence remain, for the most part, an open question. This study, working from an organizational and developmental psychopathology perspective, attempted to investigate developmental processes that place maltreated children at risk for impaired peer relationships by assessing the independent and relative influences of behavioral and emotional regulation on social competence in school-age children. Subjects were maltreated children, who are at risk for both attenuated self-regulation and impaired peer relationships, and economically disadvantaged nonmaltreated comparison children. Observations were conducted during a summer day camp, an ecologically valid context in which to study children's social interactions. As predicted, maltreated children were found to be deficient in behavioral and affective regulation, relative to nonmaltreated children. Furthermore, attenuated self-regulation mediated the effects of maltreatment on children's social competence. Results highlighted the unique contributions of both behavior and affect in predicting peer competence, suggesting that a more comprehensive approach to the study of self-regulation is warranted.

One important aspect of competence in grade-school children is the ability to regulate emotion and behavior concurrently in

social contexts. However, research on the development of children's self-regulation to date has focused on normative developmental trends in compliance among toddlers and preschoolers (Kopp, 1989, 1992; Kuczynski, Kochanska, Radke-Yarrow, & Girmius-Brown, 1987; Vaughn, Kopp, & Krakow, 1984) and investigated emotional and behavioral systems separately (Kuczynski & Kochanska, 1990). As a result, the interplay between affective and behavioral regulatory processes is largely unexplored, and their relative effects on social competence remain, to a great degree, an open question (Eisenberg, Fabes, Carlo, & Karbon, 1992).

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Address correspondence and reprint requests to: Ann M. Shields or Dante Cicchetti, Mt. Hope Family Center, 187 Edinburgh Street, Rochester, NY 14608.

This study, working from an organizational and developmental psychopathology perspective on development, was intended

to expand on these divergent lines of inquiry. Fundamental to the organizational perspective is a focus on the interdependency among biological and behavioral systems (Cicchetti & Sroufe, 1978). According to this framework, development occurs as a progression of qualitative reorganizations among and within these biological and psychological systems, proceeding through differentiation and subsequent hierarchical integration and being influenced by both organismic and environmental factors (Cicchetti, 1990, 1991; Cicchetti & Schneider-Rosen, 1986; Sroufe, 1990; Werner & Kaplan, 1963). Developmental psychopathology, by virtue of its interdisciplinary approach, also addresses multiple domains of functioning and acknowledges that there is much to be learned about the development of an organism by investigating both normative development and its aberrations (Cicchetti, 1984, *in press*; Sroufe, 1989; Sroufe & Rutter, 1984).

One of the specific implications of this integrative framework for the present study is that behavioral and emotional regulatory processes may be studied most meaningfully in concert rather than in isolation. That behavioral and emotional regulatory processes indeed are interrelated is suggested by the fact that children who tend to be aggressive or impulsive often are described as characteristically angry, easily frustrated, and emotionally labile (Cole & Zahn-Waxler, 1992), and those who tend to be socially withdrawn often are described as sad, anxious, and/or depressed (Rubin, Hymel, Mills, & Rose-Krasnor, 1991). Because traditional conceptualizations have equated self-regulation with behavioral modulation and defined competence in this domain primarily in terms of a child's behavioral compliance with the directives of an authority figure (Gralinski & Kopp, 1993), the interplay of affect and behavior in influencing self-regulation across heterogeneous settings has been little explored. The present investigation expanded on this traditional focus in two ways—first, by assessing behavioral and emotional regulatory processes concurrently and, second, by considering a wider

variety of dysregulated behaviors, including aggression, disruptive behaviors, and withdrawal, rather than focusing exclusively on noncompliance with authority figures. These other forms of behavioral dysregulation ultimately exert considerable influence on children's social acceptance and adjustment (Asher & Coie, 1990; Dodge, Coie, Pettit, & Price, 1990; Rubin et al., 1991).

Furthermore, the developmental psychopathology perspective suggests that effective negotiation of earlier stage-salient developmental tasks (such as the attainment of effective emotional and behavioral regulatory processes in toddlerhood and early childhood) potentiates competence at later developmentally salient tasks (e.g., the establishment of peer relationships among school-age children) (Cicchetti & Schneider-Rosen, 1986). Similarly, early disruptions in the development of self-regulation would portend risk for later maladaptation. Consistent with a developmental psychopathology perspective, which suggests that there is much to be learned about the development of an organism by investigating such aberrations in developmental processes, this study targeted at-risk populations in order to appreciate more fully how the development of self-regulation and social competence may go awry. Subjects included maltreated children, who often have difficulty achieving social competence and effective self-regulation (Cicchetti & Carlson, 1989; Conaway & Hansen, 1989), and economically disadvantaged nonmaltreated comparison children.

To assess social development effectively, this investigation was conducted during a 1-week summer day camp for children, which provided an optimal, ecologically valid context in which to study children's interactions with both peers and authority figures (i.e., camp counselors). This naturalistic setting enabled us to assess processes relevant to children's peer competence in arenas that were both familiar and important to children—most notably, during structured and semistructured recreational activities with peers during the course of the week-long camp session. In addition, the measure-

ments employed were intended to be contextually astute. For example, assessments of emotion regulation considered not only the valence, but also the functional significance, of children's emotion expressions during free-play interactions, rather than regarding all expressions of negative affect as dysregulated. Because the experience or expression of negative emotions at times may achieve important social ends (Thompson, 1990), optimal affective modulation was defined in terms of situational responsiveness and flexibility.

Maltreatment and Self-Regulation

Maltreated children have been shown, via independent observations and reports by parents, teachers, and peers, to be at risk for a wide array of self-regulatory deficits. Specifically, these children evidence a greater prevalence of anxiety, depression, aggression, impulsivity, inattentiveness, and social withdrawal, relative to their low-socioeconomic status (SES) and nonmaltreated peers (Aber, Allen, Carlson, & Cicchetti, 1989; Cicchetti, Ganiban, & Barnett, 1991; Erickson, Egeland, & Pianta, 1989; Toth, Manly, & Cicchetti, 1992). For example, in a longitudinal assessment, Erickson, Egeland and Pianta (1989) found that maltreated children as young as 2 years old were more angry, frustrated, and noncompliant during an experimental task than were children in a control group matched on important variables, including sociometric status. As preschoolers, these children were more hyperactive and distractible, lacking in self-control, and displaying a great deal of negative affect. In kindergarten, these children were rated by teachers as more inattentive, aggressive, and overactive.

These findings, suggesting that maltreated children are at risk for a developmental progression of pervasive emotional and behavioral dysregulation, have been corroborated by cross-sectional research. Maltreated preschoolers (Alessandri, 1991; Haskett & Kistner, 1991) and grade-schoolers (Cicchetti, Lynch, Shonk, & Manly, 1992; Kaufman & Cicchetti, 1989)

have been found to exhibit a wide variety of dysregulated behaviors, often characterized by disruptive and aggressive acts. In addition, maltreated toddlers have been shown to respond to peers' distress with poorly regulated and situationally inappropriate affect and behavior, including anger, fear, and aggression, rather than with the more normative responses of empathy and concern (Howes & Edlredge, 1985; Main & George, 1985; Troy & Sroufe, 1987). Affective dysregulation among this population also may manifest as anxiety (Salzinger, Kaplan, Pelcovitz, Samit, & Krieger, 1984) or depression and dysthymia (Kazdin, Moser, Colbus, & Bell, 1985; Toth et al., 1992).

Maltreatment and Peer Relationships

Emotional and behavioral dysregulation among maltreated children coincides with attenuated social competence, relative to nonmaltreated comparison children (Cicchetti et al., 1992; Conaway & Hansen, 1989; Mueller & Silverman, 1989). As toddlers and preschoolers, maltreated children tend to be rated as less socially skillful, in that they are less likely to initiate interactions with unfamiliar children (Alessandri, 1991; Howes & Espinosa, 1985) and to engage in group play and conversations with peers (Alessandri, 1991; Fagot, Hagan, Youngblade, & Potter, 1989). When these maltreated youngsters do interact with peers, these interactions are less likely to be positive (Lewis & Schaeffer, 1981) and to be reciprocated and are more likely to be negative (Haskett & Kistner, 1991) and to cause distress among their age-mates (Klimes-Dougan & Kistner, 1990). Not surprisingly, peers tend to rate these maltreated children as less well liked than nonmaltreated children (Haskett & Kistner, 1991).

Maladaptive social patterns also appear to impair the relationships of older maltreated children. Observations of grade-schoolers' interactions in laboratory structured-play paradigms have shown maltreated children's peer interactions to be constricted, relative to those of nonmal-

treated children: Maltreated children were less interactive and displayed less positive affect during these sessions than did their nonmaltreated peers (Jacobson & Straker, 1982). Furthermore, the social networks of maltreated school children are atypical, in that they tend to be comprised of younger children and characterized by insularity from important adults. Again, these children are more often rejected by peers (Salzinger, Feldman, Hammer, & Rosario, 1993). However, research into the social development of older maltreated children still is in its formative stages, in that few studies of these children's social interactions have been conducted in naturalistic settings and included assessments of mechanisms that may lead to maladaptation.

Behavior, Affect, and Social Competence

The importance of children's behavior in determining their social status has been underscored by an array of studies that have highlighted the deleterious effects of antisocial behaviors, and the advantageous effects of prosocial behaviors, upon children's peer acceptance. Specifically, children who tend to be friendlier and more cooperative are more highly regarded by their peers (Denham & Holt, 1993). Conversely, children who are more aggressive tend to be rejected by their age-mates (Coie & Asher, 1991; Coie, Dodge, & Coppotelli, 1982; Dodge, 1983). These behavioral patterns also appear to dictate enduring reputations within the peer group that exert a powerful influence on children's ongoing acceptance or rejection by peers (Denham & Holt, 1993).

This body of research into behavioral mediators points to potential mechanisms that place maltreated children at special social risk. Investigations of these children's interactions have indicated that maltreated children tend to engage in more disruptive, withdrawn, and aggressive acts (Cicchetti, Rogosch, Lynch, & Holt, in press; Herrenkohl & Herrenkohl, 1981; Rogosch & Cicchetti, in press) and fewer prosocial acts (George & Main, 1979; Haskett & Kistner, 1991; Howes & Eldredge, 1985; Kaufman &

Cicchetti, 1989) during interactions with age-mates. Not surprisingly, these disruptive behaviors appear to impair maltreated children's ability to interact positively and proactively during play periods with others (Fagot et al., 1989). In addition, it appears that these behavioral tendencies translate into reputations among peers for being less likely to share and to serve as leaders (e.g., to act prosocially) and more likely to be mean and to seek attention inappropriately (e.g., to act out) (Salzinger et al., 1993)—reputations that may disrupt attempts to gain peer-group acceptance over time (Denham & Holt, 1993).

Although emotion regulation increasingly has come to be regarded as a primary developmental task with wide-ranging implications for children's social development (Cicchetti, Ganiban, & Barnett, 1991; Thompson, 1990), research has tended to focus on either behavioral or cognitive, rather than affective, correlates of children's social competence. In particular, little empirical attention has been directed toward concurrent emotional processes other than empathic responsiveness that also may determine the quality of children's peer relationships. Nevertheless, investigations of behavioral determinants of children's social status have alluded to the important role that affect may play. For example, empirical work that has delineated two subtypes of aggressive behavior in children emphasizes that this dysregulated behavior may differ according to the valence and intensity of the child's concurrent emotional expression: Proactive aggression is defined as a relatively nonemotional assertion of power motivated by the desire to achieve an instrumental goal, whereas reactive aggression is described as an angry and hostile defensive response to a real or perceived threat (Dodge & Coie, 1987).

Similarly, investigations of positive peer-directed actions have highlighted the key role that empathy and temperament may play in motivating and directing children's prosocial behavior. For example, children who experience an affective response to another person's distress are more likely to ac-

tively attempt to comfort or aid the distressed person. In addition, children who display this empathic response during interactions with peers are more likely to share and to cooperate with others (Eisenberg & Mussen, 1989). More enduring emotional processes, such as temperament, also have been thought to influence the likelihood of children engaging in helping behaviors. For example, children's prevailing emotion (happy vs. angry) has been found to predict their tendency to act prosocially with peers (Denham, 1986). Nevertheless, a common thread among these research programs is a tendency to regard the effects of emotion on children's social competence as indirect—that is, via affect's ability to motivate either socially appropriate (Denham, McKinley, Couchoud, & Holt, 1990) or inappropriate (Dodge, 1986) behaviors.

However, it may well be that emotion affects social competence in ways other than via its ability to motivate and direct discrete behavioral responses to social stimuli. For example, the primary process whereby affective regulation influences competence may be via the maintenance of an emotional homeostasis that facilitates engagement with one's environment and with others. Consistent with a developmental psychopathology perspective, emotional regulation would serve, in this formulation, as a foundation for the development of effective relations with peers, whereas an inability to effectively negotiate this earlier developmental task may have pervasive effects on later development, including the impairment of interpersonal relationships. Because effective emotional regulatory processes develop within the context of the early caregiver-child relationship, disruptions in this attachment relationship, which are prevalent among maltreated children (Cicchetti & Barnett, 1991), would place children at risk for pervasive poor developmental outcomes, including impaired peer relationships.

The relative effects of behavior and affect on children's competence may be tested via hierarchical regression equations. If emotion regulation, when entered into a re-

gression equation with behavioral regulation, retained its predictive value on children's social competence, then one may assume that emotion's effects on social competence are not mediated solely by emotion's effects on important social behaviors. This finding would be consistent with an organizational perspective, which would suggest that emotional and behavioral regulatory processes, although interrelated, may be expressions of developmentally distinct systems.

In addition, hierarchical regression analyses may be employed to illuminate those processes that mediate maltreatment's effects on children's peer relationships. Specifically, if maltreatment status' predictive value on social competence were no longer significant when behavioral and/or emotional regulation were entered into the equation, then these self-regulatory processes might be assumed to mediate the effects of maltreatment on children's competence. This finding would be consistent with a developmental psychopathology perspective, which suggests that early maladaptation inhibits the attainment of competence at later stage-salient developmental tasks.

To illuminate those developmental processes whereby maltreatment affects children's peer competence, this study was designed to test the following hypotheses:

1. Maltreated grade-schoolers, relative to nonmaltreated comparison children, will evidence behavioral and affective dysregulation in a naturalistic day-camp setting.
2. These maltreated children also will evidence deficits in social competence, relative to nonmaltreated comparison children.
3. Consistent with an organizational perspective, behavioral and emotional regulatory processes will be related. However, emotion's effects on children's social competence will not be mediated solely by its ability to drive important social behaviors. Specifically, emotion regulation will predict a unique amount of

the variance in children's social competence during semistructured free-play periods, over and above the effects of important social behaviors.

4. Attenuated behavioral and affective self-regulation will mediate the effects of maltreatment on children's social competence.

Method

Subjects

Subjects were 81 maltreated (29 girls and 52 boys) and 48 nonmaltreated children (16 girls and 32 boys), 8–12 years old, who attended a summer day camp sponsored by Mt. Hope Family Center. (This sex distribution is typical for maltreated children who are referred for services during early and middle childhood [Cicchetti & Barnett, 1991].) Of the 81 maltreated children, 36 were classified as physically abused, 39 as neglected, and 6 as sexually abused. Despite the prevalence of multiple types of abuse among many maltreating families (Barnett, Manly, & Cicchetti, 1993; Cicchetti & Rizley, 1981), a primary designation of maltreatment subtype was determined for each child by assessing the degree to which a particular form of maltreatment violated societal norms. Specifically, children who experienced sexual abuse were categorized as sexually abused, regardless of other forms of abuse they may have experienced; children who were physically, but not sexually, abused were classified as physically abused; and children who were neglected, but not sexually or physically abused, were classified as neglected.

The two groups were comparable on age and multiple demographic variables (Table 1), including SES, percentage of families receiving Aid to Families with Dependent Children (AFDC), and single- versus two-parent households. There were significant group differences on three demographic variables: maternal education (as assessed by highest school grade completed), maternal employment, and number of children in

the household. None of these three variables was correlated significantly with the outcome variables; therefore, they were not covaried in subsequent analyses.

All of the maltreating families had received services from the Monroe County Department of Social Services (DSS); the presence of maltreatment in each family was verified under the criteria of New York state law following an investigation by DSS. Comparison children were recruited through radio announcements and posters placed in welfare offices, housing projects, and neighborhood businesses. Their nonmaltreatment status was verified by examining the DSS child abuse registry.

Procedure

All data were collected during a 1-week day camp for at-risk inner-city children, which has been sponsored by Mt. Hope Family Center for 8 consecutive years. (These data were collected during the seventh camp session.) Children attended camp for a week-long session, during which they participated in recreational activities in groups of six to eight, which were led by three counselors (see Cicchetti & Manly, 1990, for a detailed description of camp procedures). Prior to camp, parents gave informed consent for their children to participate in research activities periodically during the week. During camp, children were given a choice about whether or not to participate in these research activities, in return for which they were given points that could be exchanged for a variety of small prizes. This incentive promoted nearly perfect compliance with research participation.

Six 1-week sessions were held during the summer. Children were assigned to groups that were comprised of peers of the same sex and age. Each group was led by three counselors, who were unaware of maltreatment status and experimental hypotheses, and whose intensive contact with the children throughout the week (approximately 35 h) enabled them to assess children's functioning more thoroughly than would have

Table 1. Contrasts of maltreated and nonmaltreated groups on demographic variables

	Maltreated <i>M (SD)</i>	Nonmaltreated <i>M (SD)</i>	<i>t</i>
Maternal education (highest grade completed)	11.21 (1.69)	11.98 (1.45)	2.55*
Total family income	\$16,477	\$18,122	1.14
Number of children	3.36 (1.46)	2.59 (.96)	-3.53**
Years receiving AFDC	8.48 (3.87)	6.87 (5.06)	-1.91
Child's age	10.08 (1.38)	9.85 (1.32)	-0.92
	% Maltreated	% Nonmaltreated	χ^2
Minority race/ethnicity	75	79	0.19
Married or living with partner	33	43	1.27
Working full- or part-time	24	43	4.84*

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

been possible by research assistants in a laboratory setting.

Measures

Child Behavior Checklist—Teacher's Report Form. At the end of each week-long camp session, counselors completed the Child Behavior Checklist—Teacher Report Form (CBCL-TRF; Achenbach & Edelbrock, 1981) on the children who had been members of their groups. The CBCL-TRF is comprised of 118 items designed to assess behavior problems in children age 4–16 years. Each item is rated on a scale from 0 (not true), 1 (somewhat or sometimes true), to 2 (very true) for each child, assessing such problem behaviors as aggression, defiance, noncompliance, impulsivity, antisocial acts, fearfulness, and anxiety.

The CBCL-TRF is one of the most widely used and well-validated other-report measures of children's adjustment and has been normed on both clinical and nonclinical populations. This measure yields two broad-band factors that represent children's internalizing and externalizing symptomatology—both of which were used in this study. Reliability among teams of counselors ranged from a Cronbach's alpha of .79 to .96 on the externalizing subscale and from .60 to .98 on the internalizing subscale.

For each child who attended camp, correlations and standard deviations among counselors' ratings were computed. When more than two counselors completed this measure on a child, only the two assessments that were the most highly correlated were retained. The means of the two counselors' ratings were calculated to yield one score each for internalizing (TRF-I) and for externalizing (TRF-E) problems.

California Child Q-Set. The California Child Q-Set (CCQ-Set; Block & Block, 1969) is comprised of 100 items to be sorted by raters familiar with a particular child into nine categories along a forced-choice format ranging from most to least descriptive of the child. The number of items assigned to each category is meant to approximate a normal curve. At the end of each camp session, counselors generated Q-sort profiles for each child in their group. Correlations and standard deviations among raters then were computed, and, in cases in which three counselors rated each child, only the two most highly correlated profiles were retained. To generate a global rating of social competence (Q-SOCIAL), children's individual Q-sort profiles were correlated with the criterion sort created by Waters, Noyes, Vaughn, and Ricks (1985). Reliability on Q-SOCIAL among teams of

counselor raters ranged from a Cronbach's alpha of .75 to .91.

Counselor behavior ratings. Twice during each camp session, counselors completed 7-point ratings for each child on his or her tendency to engage in aggressive (AGGRESS), prosocial (PROSOCIAL), and withdrawn (WITHDRAWN) behaviors (Wright, 1983). Each scale required counselors to rate the child on a scale from 1 to 5, from "not at all descriptive" to "highly descriptive" of the individual. Counselors completed these ratings on two occasions during the week—after their groups participated in semistructured play periods on Tuesdays and Thursdays. During these periods, children participated in a variety of games and recreational activities with both peers and counselors. Counselors were asked to report on each child's behavior during the previous play period only.

Counselor ratings of AGGRESS assessed both physical and verbal aggression, asking raters to determine how characteristic behaviors such as bullying, teasing, and fighting were of a child during the previous activity. For the PROSOCIAL scale, counselors reported how helpful, cooperative, and considerate a child had been during the play period. The WITHDRAWN scale included behaviors such as isolating oneself and avoiding contact with others. Interrater reliability as assessed by Cronbach's alpha ranged from .87 to .90 for AGGRESS, from .75 to .93 for PROSOCIAL, and from .67 to .90 for WITHDRAWN.

Observations. Three 10-min observations of each child's spontaneous interactions with peers and counselors were conducted during the same play periods on Tuesdays and Thursdays. These periods were chosen because they reflected a social arena that was both familiar and important to grade-schoolers (e.g., playground interactions with other children and authority figures). Trained observers, unaware of both maltreatment status and experimental hypotheses, completed molar ratings for each child

on two behavioral dimensions: behavioral dysregulation (ACT-OUT) and social interaction (OB-SOCIAL). Mean scores were computed across the three observations for each child on each of the variables.

The ACT-OUT scale was designed to assess a variety of externalizing behaviors, including impulsivity, verbal aggression, physical aggression, and defiance. Children received a score from 1 to 6 during each observation period, with a score of 1 being assigned to children who exhibited none of these behaviors during each 10-min observation period to a score of 3 representing verbal aggression or relatively minor physical aggression, to a score of 6 representing ongoing behavioral dysregulation characterized by repeated acts of aggressive, defiant, impulsive, and/or disruptive behaviors. Interrater reliability was .98 for this scale, as assessed by Cronbach's alpha.

OB-SOCIAL was designed to assess children's relative level of cooperative play, from disengaged to organized play, and was based on Parten's (1933) work. Parten's formulation delineates a developmental progression of children's play with peers, with the least complex activity being disengaged from the peer group and the most complex involving cooperative, organized play with others. Because this progression reflects an increasingly cooperative and interactive style of play, this scale was regarded as a measure of social competence that was appropriate for the playground context. The most complex level of play assessed by this scale was developmentally appropriate for all children in this study.

Children received a score reflecting their highest sustained level of play (e.g., play that was maintained for a period of 2 min or longer) exhibited during each 10-min segment. For example, a child who was disengaged from his or her environment received a score of 1; a child who played alone, a score of 2; a child who observed other children without joining in, a score of 3; a child who played next to, but not with, other children, a score of 4; a child who engaged in associative play, a score of 5; and a child

who was engaged in cooperative, organized play, characterized by a division of labor and a mutual goal, a score of 6. In addition, these scores were corrected for the level of play that the counselor introduced to the setting. Reliability among observers was .95 for this scale, as assessed by Cronbach's alpha.

The same independent observers also recorded children's emotion regulation by noting both the valence and functional significance of each child's emotion expressions (e.g., whether the latter were appropriate or inappropriate in the context of the child's ongoing social interactions). Positive and negative emotions were identified primarily by facial expressions, as delineated by Ekman and Friesen's (1975) guidelines, although coders also took into account voice tone and body posture (Izard, 1982; Scherer, 1979).

Emotion expressions were determined to be appropriate or adaptive if they were situationally responsive to the ongoing play context. For example, expressions of anger directed toward an intrusive or aggressive peer were coded as appropriate, for they potentially would serve an important self-defensive goal. However, if this anger were directed toward an inappropriate target (e.g., another child), its functional significance in this context would be negated, and it would be coded as inappropriate or maladaptive. In addition, if this anger were so intense as to undermine an adaptive response, or so persistent as to outlive its usefulness, it would be coded as inappropriate as well.

Coders noted either the presence or absence of the following seven emotion expression categories during each 10-min observation period: appropriate positive with peers, appropriate positive with adults, inappropriate positive with peers, inappropriate positive with adults, inappropriate negative with peers, inappropriate negative with adults, and appropriate negative with peers. (Appropriate negative with adults was not coded, due to failure among raters to achieve acceptable reliability—most likely

due to the low base rate of this variable.) Interobserver agreement on the emotion scales ranged from .76 for inappropriate positive with adults to .96 for appropriate positive with peers.

Results

Group differences

A composite emotion regulation score (E-REG) first was computed from independent observers' ratings of children's affective expressions. Mean scores for each of the seven emotion expression categories were computed across the three observational periods. Then, the mean scores of all inappropriate affective displays with both peers and adults were summed, as were the scores of all appropriate affective displays with both peers and adults. Finally, the summary inappropriate score was subtracted from the summary appropriate score to create the E-REG composite. Thus, higher scores on the E-REG composite reflected more adaptive emotional regulation.

Because previous research consistently has demonstrated significant sex differences on measures of behavioral regulation and social competence, a 2 (Gender) \times 2 (Maltreatment Status) multivariate analysis of variance was conducted. Results indicated that there were significant group differences on both the social competence and emotional and behavioral self-regulation variables (Table 2). Consistent with findings of previous research, among this sample there were significant main effects for both maltreatment status ($F(9, 113) = 1.99, p < .05$) and gender ($F(9, 113) = 7.91, p < .001$). The interaction term was not significant.

Group differences, behavioral regulation

On measures of behavioral regulation, boys, relative to girls, and maltreated, relative to nonmaltreated, children, evidenced

Table 2. Group differences on self-regulation and social competence variables, multiple analysis of variance results

	Maltreated		Nonmaltreated	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
AGGRESS	9.89	(8.61)	8.91	(8.27)
ACT-OUT	2.03	(0.91)	1.75	(0.88)†
TRF-E	14.44	(12.11)	12.66	(12.51)
TRF-I	7.44	(5.49)	5.62	(4.80)*
WITHDRAWN	6.35	(6.94)	4.31	(4.45)*
PROSOCIAL	25.90	(7.28)	27.32	(7.20)
OB-SOCIAL	-1.15	(0.75)	-0.94	(0.72)*
Q-SOCIAL	0.21	(0.33)	0.34	(0.37)*
E-REG	0.79	(0.90)	1.17	(0.88)**

	Boys		Girls	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
AGGRESS	13.27	(8.12)	2.87	(3.60)***
ACT-OUT	2.24	(0.94)	1.36	(0.47)***
TRF-E	17.52	(13.11)	7.14	(6.54)***
TRF-I	7.59	(5.21)	5.32	(5.20)**
WITHDRAWN	6.89	(6.57)	3.31	(4.75)**
PROSOCIAL	24.43	(7.37)	29.96	(5.52)***
OB-SOCIAL	-1.21	(0.75)	-0.83	(0.66)**
Q-SOCIAL	0.17	(0.35)	0.41	(0.29)***
E-REG	0.73	(0.94)	1.29	(0.72)***

† $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

deficits. Specifically, on the TRF subscale assessing externalizing behavior problems (TRF-E), there was a main effect for gender ($F(1, 121) = 24.74, p < .001$), indicating that boys, relative to girls, evidenced more externalizing behaviors across the camp session. In addition, there also was a main effect for gender on counselor-reported aggression during free-play periods (AGGRESS) ($F(1, 121) = 61.46, p < .001$), indicating that boys were more likely than girls to be aggressive during these social interactions. On independent observers' ratings of behavioral dysregulation during free plays (ACT-OUT), there again was a main effect for gender ($F(1, 121) = 32.05, p < .001$), indicating that boys were more likely than girls to evidence disruptive, aggressive, and noncompliant behaviors during these play periods. Moreover, the main effect for maltreatment status approached

significance on ACT-OUT, $F(1, 121) = 3.59, p = .06$.

Both boys and maltreated children also exhibited a greater prevalence of internalizing problems, as indicated by counselor ratings on the TRF subscale assessing internalizing problems (TRF-I). On the TRF-I, there were main effects for both gender ($F(1, 121) = 8.41, p < .01$) and maltreatment status ($F(1, 121) = 6.21, p < .05$). These results were corroborated by counselor ratings of children's tendency to withdraw from the group during play periods (WITHDRAWN). On WITHDRAWN, significant differences were obtained by maltreatment status ($F(1, 121) = 4.01, p < .05$) and by gender ($F(1, 121) = 10.95, p < .01$)—demonstrating again that both boys and maltreated subjects tended to exhibit more internalizing and withdrawn behaviors during the camp session.

Group differences, emotional regulation

Analyses of the E-REG composite demonstrated that maltreated children, relative to nonmaltreated children, and boys, relative to girls, evidenced attenuated emotional regulation during free-play interactions: There were main effects for both maltreatment status ($F(1, 121) = 7.41, p < .01$) and for gender ($F(1, 121) = 14.26, p < .001$), in that both boys and maltreated children received significantly lower scores on this E-REG composite.

Individual analyses of variance on the inappropriate and appropriate summary scores demonstrated that these differences were most likely to manifest as a greater prevalence of inappropriate affective displays by maltreated children as well as by boys. That is, although there were no differences by maltreatment status or by gender on the presence versus absence of appropriate or adaptive emotion expressions, there were main effects on inappropriate displays for both maltreatment status and for gender, $F(1, 125) = 5.18, p < .05$, and $F(1, 125) = 15.83, p < .001$, respectively. These results indicated that both boys and maltreated children were more likely to evidence inappropriate affective displays during play.

Group differences, social competence

The same pattern of results held for indices of social competence in that there were group differences by maltreatment status and by gender on these measures. Specifically, on the CCQ-Set composite assessing children's social competence (Q-SOCIAL), there was a main effect for maltreatment status ($F(1, 121) = 6.34, p < .05$) and for gender ($F(1, 121) = 17.79, p < .001$), indicating that boys and maltreated children were rated as less socially competent by counselors across the week-long camp session.

The two measures of social competence, Q-SOCIAL and OB-SOCIAL, were correlated significantly ($r = .38, p < .001$), indicating that there was agreement among

raters and across measures assessing peer competence. Not surprisingly, then, analyses of independent observers' assessments of children's social competence during play periods (OB-SOCIAL) also resulted in main effects for both maltreatment status ($F(1, 121) = 4.19, p < .05$) and for gender ($F(1, 121) = 10.59, p < .01$). In addition, during these play periods, counselors reported that they witnessed more helpful and cooperative behaviors by girls, relative to boys. That is, a main effect for gender only was obtained on PROSOCIAL, $F(1, 121) = 18.53, p < .001$.

Relationship between emotional and behavioral regulation

To assess the relationship between affective and behavioral regulation, a correlation matrix of these variables was generated, as shown in Table 3. Results indicated that the E-REG composite indeed was related significantly to indices of behavioral regulation and dysregulation. Correlations between E-REG and externalizing behaviors were as follows: ACT-OUT during free plays, $r = -.68, p < .001$; AGGRESS in the free-play setting, $r = -.53, p < .001$; and externalizing behavior problems, as assessed by the TRF-E, $r = -.39, p < .001$. Although E-REG was not related to TRF-I, the emotion regulation composite score was correlated significantly with internalizing behaviors, as assessed by WITHDRAWN, $r = -.22, p < .01$. Furthermore, E-REG was correlated significantly with effective behavioral regulation in social settings, as assessed by PROSOCIAL, $r = .39, p < .001$.

Relationship between self-regulation and social competence

To assess the relationship between self-regulation and social competence, correlations among the self-regulation variables and the two social competence measures (OB-SOCIAL and Q-SOCIAL) were computed (see Table 3). These correlations indicated that there indeed were significant

Table 3. Correlations among measures of self-regulation and social competence

	E-REG	ACT-OUT	AGGRESS	TRF-E	TRF-I	WITHDRAWN	PROSOCIAL	Q-SOCIAL
ACT-OUT	-.68***							
AGGRESS	-.53***	.67***						
TRF-E	-.39***	.53***	.65***					
TRF-I	n.s.	n.s.	n.s.	.34***				
WITHDRAWN	-.22**	.21*	.15†	.26**	.61***			
PROSOCIAL	.39***	-.42***	-.45***	-.60***	-.43***	-.58***		
Q-SOCIAL	.20*	-.26**	-.43***	-.62***	-.70***	-.51***	.69***	
OB-SOCIAL	.45***	-.36***	-.26**	-.26**	-.26**	-.51***	.53***	.38***

†p = .06. *p < .05. **p < .01. ***p < .001.

relationships between emotional and behavioral self-regulation and children's ability to interact effectively with peers. First, the relationship between Q-SOCIAL and E-REG was found to be significant, $r = .20$, $p < .05$. In addition, correlations between Q-SOCIAL and measures assessing behavioral dysregulation were as follows: with ACT-OUT, $r = -.26$, $p < .01$; with AGGRESS, $r = -.43$, $p < .001$; with TRF-E, $r = -.62$, $p < .001$; with TRF-I, $r = -.70$, $p < .001$; and with WITHDRAWN, $r = -.51$, $p < .001$. Finally, Q-SOCIAL also was correlated significantly with effective behavioral regulation in social settings, as assessed by PROSOCIAL, $r = .69$, $p < .001$.

A similar pattern of findings was obtained for assessments of children's social competence during play periods. OB-SOCIAL was correlated significantly with E-REG, $r = .45$, $p < .001$. In addition, OB-SOCIAL also was related significantly with measures of behavioral dysregulation: with ACT-OUT, $r = -.36$, $p < .001$; with AGGRESS, $r = -.26$, $p < .01$; with TRF-E, $r = -.26$, $p < .01$; with TRF-I, $r = -.26$, $p < .01$; and with WITHDRAWN, $r = -.51$, $p < .001$. In addition, OB-SOCIAL also was related significantly to effective behavioral regulation, as assessed by PROSOCIAL behavior, $r = .53$, $p < .001$.

Relative effects of emotion and behavior upon peer competence

To determine whether or not emotion affected children's social competence solely via its influence on important social behaviors, a hierarchical regression analysis was conducted. Because this analysis focused on concurrent processes affecting children's ongoing peer interactions, data collected during children's semistructured play periods were the focus of this analysis. OB-SOCIAL first was selected as the outcome variable of interest; then, because a main effect for sex had been obtained on this variable, a residualized form of OB-SOCIAL, controlling for the effects of sex, was com-

puted as the dependent variable. E-REG, which assessed concurrent emotional processes, was included as an independent variable to determine the contribution of emotional processes toward predicting peer competence. Finally, AGGRESS and PROSOCIAL also were included as independent variables, because they represented two primary social behaviors via which emotion is thought to influence children's social competence (see Table 4).

To test the mediational model, maltreatment status was entered on Step 1, E-REG on Step 2, and the behavioral variables on Step 3. If the inclusion of the behavioral variables on Step 3 were to negate the effects of E-REG that presumably were obtained on Step 2, then a mediational model, which suggests that emotion affects social competence exclusively via its effects on behavior, would be supported.

On Step 1, maltreatment status was entered and not found to be a significant predictor of the residualized form of OB-SOCIAL, $B = -.15$, not significant (n.s.), $R^2 = .02$. On Step 2, E-REG was entered, and it made a significant contribution toward predicting peer competence in the play setting, $B = .37$, $p < .001$, $R^2 = .16$. On Step 3, AGGRESS and PROSOCIAL were entered, and each was a significant predictor of effective interactions in the play setting, $B = -.28$, $p < .01$, and $B = .42$, $p < .001$, respectively. Furthermore, with the inclusion of these behavioral variables on Step 3, E-REG continued to predict a unique amount of the variance in the residualized OB-SOCIAL score, $B = .36$, $p < .001$. (Thus, the model positing the mediation of emotion's effects by social behaviors did not receive empirical support.)

The model including maltreatment status, E-REG, AGGRESS, and PROSOCIAL predicted 31% of the variance in children's ability to interact effectively with peers during the observational periods, $F(4, 123) = 13.56$, $p < .001$.

Similar effects were maintained when conducting regression analyses within maltreatment status. That is, within both maltreated and nonmaltreated groups, emotion

Table 4. Relative effects of emotion and behavior on peer competence: Hierarchical regression results

	Variables in the Equation	B	Model R ²
Step 1	Maltreatment status	-.15	.02†
Step 2	Maltreatment status	-.08*	.16***
	Emotion regulation	.37***	
Step 3	Maltreatment status	-.04	.31***
	Emotion regulation	.36***	
	Aggression	-.28**	
	Prosocial behavior	.42**	

* $p < .05$. ** $p < .01$. *** $p < .001$. † $p = .09$.

retained its predictive value on the residualized OB-SOCIAL variable, even when included in the equation with AGGRESS and PROSOCIAL. (Among maltreated children, $B = .27$, $p < .05$, for E-REG on Step 3; among nonmaltreated children, $B = .56$, $p < .01$, for E-REG on Step 3.) However, only among maltreated children did AGGRESS retain its predictive value in the final step, $B = -.30$, $p < .05$.

Mediators of maltreatment's effects on social competence

To assess these potential mediators of maltreatment's effects on children's social competence, analyses next were conducted on Q-SOCIAL, which reflected counselors' assessments of children's social competence across a variety of settings and activities during the week-long camp session. Because behavioral dysregulation may be expressed as either externalizing or internalizing difficulties, behavioral regulation composite scores were computed for these two dimensions: aggressive/disruptive dysregulated behaviors (EXTERNAL) and inhibited/withdrawn dysregulated behaviors (INTERNAL). The composite score for EXTERNAL was compiled by computing the mean of the standardized scores for TRF-E, AGGRESS, and ACT-OUT. For INTERNAL, the mean of the standardized scores for TRF-I and WITHDRAWN was computed. These two behavioral regulation composites were correlated significantly, r

$= .20$, $p < .05$. Although EXTERNAL was correlated significantly with E-REG ($r = -.62$, $p < .001$), INTERNAL was not ($r = -.12$, n.s.).

A hierarchical regression analysis then was conducted, with the dependent variable being a residualized form of Q-SOCIAL, from which the effects of gender had been partialled. On Step 1, maltreatment status was entered and found to be a significant predictor of this residualized variable ($F(1, 124) = 4.81$, $p < .05$), indicating again that maltreatment had a deleterious effect on children's social competence, even when controlling for the effects of gender.

On Step 2, the E-REG composite score was entered. At this point, E-REG did not contribute significantly to the overall model, $B = .08$, n.s. However, when the two behavioral regulation composite scores were entered on Step 3, both INTERNAL ($B = -.60$, $p < .001$) and EXTERNAL ($B = -.29$, $p < .01$) predicted a unique amount of the variance in the residualized Q-SOCIAL. With the entry of the behavioral regulation variables on Step 3, the B weight for E-REG became negative, $B = -.18$, $p < .05$. Because this relationship is in the opposite direction from the zero-order correlation between E-REG and Q-SOCIAL, this effect appears to be one of suppression, perhaps as a result of the overlap between E-REG and the EXTERNAL composite score (Cohen & Cohen, 1983).

With E-REG, INTERNAL, and EXTERNAL included in the regression equa-

Table 5. Mediators of maltreatment's effects on Q-sort measures of social competence: Hierarchical regression results

	Variables in the Equation	B	Model R ²
Step 1	Maltreatment status	-.19*	.04*
Step 2	Maltreatment status	-.18*	.04†
	Emotion regulation	.08	
Step 3	Maltreatment status	-.09	.51***
	Emotion regulation	-.18*	
	Internalizing behaviors	-.60***	
	Externalizing behaviors	-.29**	

† $p = .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

tion, maltreatment status no longer was a significant predictor of children's social competence, $B = -.09$, n.s. (Table 5). This indicates that self-regulatory capacities mediate the effects of maltreatment status on peer competence. The model comprised of maltreatment status, E-REG, EXTERNAL, and INTERNAL predicted 51% of the variance in the residualized Q-SOCIAL variable, $F(1, 121) = 31.16$, $p < .001$.

Analyses within maltreatment status

To determine whether these processes differed among maltreated versus nonmaltreated children, analogous hierarchical regression analyses were conducted within groups, in which E-REG was entered on Step 1 and INTERNAL and EXTERNAL were entered on Step 2. Results indicated that INTERNAL and EXTERNAL again were significant predictors of social competence within both maltreated and nonmaltreated groups. Again, the potential influence of E-REG was clouded by suppression within both groups.

Among maltreated subjects, when all three self-regulation variables were included in the equation on Step 2, both INTERNAL ($B = -.60$, $p < .001$) and EXTERNAL ($B = -.25$, $p < .05$) were significant predictors of the residualized Q-SOCIAL. The effects of E-REG again appeared to be suppressed, $B = -.23$, $p < .05$. Furthermore, the model comprised of E-REG, INTERNAL, and EXTERNAL

predicted 46% of the variance in the residualized Q-SOCIAL variable among maltreated subjects, $F(3, 75) = 20.96$, $p < .001$.

Suppression of E-REG also was apparent among nonmaltreated subjects ($B = -.12$, n.s.), and both the INTERNAL ($B = -.62$, $p < .001$) and EXTERNAL ($B = -.32$, $p < .05$) composite scores predicted a unique amount of the variance in the residualized social competence score. Among nonmaltreated subjects, the model comprised of these three variables predicted 59% of the variance in peer competence, $F(3, 43) = 20.92$, $p < .001$.

Discussion

The results of this study confirm and extend those of previous work, demonstrating that school-age maltreated children, similar to their younger counterparts, are at risk for impaired peer relationships. Maltreated grade-schoolers were found to be less socially competent than economically disadvantaged comparison children, according to assessments by both counselors and independent observers. The fact that these data were collected in the context of a naturalistic day-camp setting lends special credence to these findings, because this location facilitated assessments of children's spontaneous interactions with both age-mates and authority figures in arenas that were both familiar and important to children.

In addition to this attenuated social competence among maltreated children were co-incident self-regulatory deficits. Specifically, maltreated children were more likely to evidence behavioral dysregulation, most often in the form of internalizing difficulties, as assessed by both the CBCL-TRF and independent observers' ratings of behavior during semistructured free-play sessions. In addition, of marginal significance were analyses suggesting that maltreated children were more likely to engage in aggressive, disruptive, and/or noncompliant behaviors during interactions with other children and with camp counselors during play periods.

Impaired self-regulation also was expressed as emotional dysregulation among maltreated children. This investigation was unique in its focus on emotional processes in older at-risk children, which were assessed via observations of spontaneous affective expressions in naturalistic social settings. Maltreated grade-schoolers' interactions during play with peers more often reflected maladaptive patterns of emotion regulation, characterized by inflexible and situationally inappropriate affective displays. Because similar processes have been witnessed among maltreated toddlers and preschoolers, this study suggests that these emotional deficits may be enduring, placing maltreated children at ongoing risk for maladaptation during the grade school years, as well.

Of special import was the finding that self-regulatory deficits mediated the effects of maltreatment on children's social competence. When behavioral dysregulation composite scores, representing internalizing and externalizing difficulties, were entered into a regression equation predicting children's peer competence, each accounted for a unique amount of the variance in peer competence. Furthermore, these behavioral regulation composite variables rendered maltreatment an insignificant predictor of social competence. In demonstrating that behavioral regulation appears to mediate in part maltreatment's effects on peer competence, this study delineates important developmental processes that place maltreated

children at risk for disruptions in interpersonal relationships. The results of this study are consistent with a developmental psychopathology perspective, which would suggest that maladaptation on earlier stage-salient developmental tasks—in this case, self-regulation in infancy, toddlerhood, and early childhood—places children at risk for poor developmental outcomes at later critical tasks (i.e., the establishment of effective peer relationships during the grade school years).

The potential mediational effects of emotional regulation, however, were less straightforward, as suppression effects clouded the interpretation of these analyses. Unless this suppression effect were consistently replicated in future research, it would be difficult to interpret and most likely may be attributed to an overlap among measures targeting related constructs. In this case, the externalizing behavioral-regulation composite, in sharing a significant amount of variance with the emotion regulation assessment, most likely suppressed the effects of emotion regulation in the regression equation. Therefore, one important task of future research would be to clarify the potential mediational role of affect in predicting peer competence by incorporating more comprehensive assessments of emotion regulation.

Nevertheless, the important role that emotional processes played in predicting children's peer competence should not be overlooked. Contrary to alternate models that suggest that emotion influences children's competence primarily via its ability to motivate discrete social behaviors, analyses of children's interactions during semistructured free-play periods demonstrated that emotional processes predicted a unique amount of the variance in peer competence, over and above the effects of behavior. Similarly, social behaviors, in the form of pro-social acts and aggression, remained significant predictors of social competence when controlling for the effects of emotion, with aggression playing an especially important role among maltreated children. As an or-

ganizational perspective would suggest, although emotional and behavioral self-regulatory processes are interrelated, each appears to represent a distinct developmental system that differentially and individually affects children's competence.

In highlighting these independent contributions of emotion and behavior, this study suggests that a more comprehensive conceptualization of self-regulation is warranted. Rather than focusing solely on children's behavioral compliance, empirical approaches to the development of self-regulation may do well to incorporate an emotional component, as well. Because the study of emotion regulation among older children is in its formative stages, measurement development is a primary task for such an integrative approach. The need for comprehensive assessments of emotional processes in older children may be underscored by the suppression effects obtained in the present analyses; these effects most likely were due to an overlap between the externalizing behavior composite and the emotion regulation measure and may be clarified via more comprehensive assessments of children's affective processes. Toward this end, at Mt. Hope Family Center an assessment battery of emotional regula-

tion targeting preschoolers and school-age children is being developed.

In addition to calling for more integrative research into social development—an approach that would attend to behavior and affect simultaneously—the present study also suggests important foci for interventions with at-risk children. Emotional regulation was found to be correlated significantly with a variety of dysregulated behaviors that impaired children's ability to interact with peers, including aggression, disruptive behaviors, and a tendency to withdraw from one's social surround. This relationship between emotional processes and internalizing and externalizing phenomena suggests that interventions targeting behavior disorders in children may do well to focus on more than the behavior itself. Indeed, children's emotional experiences, and their self-regulatory capacities with respect to emotion, also may serve as foci for intervention insofar as they may promote or support patterns of dysregulated behavior. In so doing, clinicians may foster more effective self-regulatory strategies in children, which would facilitate, in turn, the establishment of positive relationships with peers among children at risk for maladaptive outcomes.

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