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Preschoolers' effortful control and negative emotionality, immediate reactions to disappointment, and quality of social functioning

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Abstract

Relations among effortful control/low negative emotionality, immediate reactions in a situation that usually calls for the masking of disappointment (i.e., the use of display rules), and social competence/adjustment were investigated for 78 preschool children (mean age = 4.87 years). Parents, teachers, and peers rated children on negative emotionality and/or effortful control as well as on social competence/adjustment. Children who were rated by parents and teachers as high on effortful control/low on negative emotionality expressed fewer immediate verbal/gestural indicators of disappointment in the presence of an unfamiliar adult and were perceived by their parents, teachers, and peers as socially competent and well adjusted. The pattern of findings was consistent with the view that children's immediate verbal/gestural reactions to disappointment partially mediated the relations between effortful control (as reported by parents) and social competence/adjustment.

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Introduction

People encounter experiences that violate their expectations in their daily lives. Such experiences, when interpreted negatively, often result in disappointment. If the situation calls for masking of people's natural reactions, people often employ display rules to guide their behaviors, that is, socially constructed conventions that dictate where, when, and how emotion-related behaviors should be expressed (Ekman & Friesen, 1969; Saarni, 1981). A common North American display rule is to react positively or politely when receiving a gift, even if the gift is disappointing (Cole, 1986; Gnepp & Hess, 1986; Saarni, 1981; Saarni & von Salisch, 1993). In general, people who violate such social conventions or customs are susceptible to social rejection or punishment (Scheff, 1984). Thus, individuals who use emotional display rules effectively tend to be perceived by others as more socially competent and better adjusted than those who violate contextual demands, norms, or customs (Garner, 1996; McDowell & Parke, 2000).

According to Ekman and Friesen (1969), individuals using display rules could intensify (e.g., exaggerate smile when receiving a mildly pleasant gift), minimize (e.g., reduce joy when winning over a dear friend), neutralize (e.g., maintain neutral facial expression or "poker face"), and dissimulate or substitute (e.g., "false smile") facial displays depending on contextual demands, norms, or customs. Individuals who use display rules successfully often need an understanding of the norms or rules and the ability to modulate (e.g., inhibit, change) the expression of their experienced emotions. Thus, the use of display rules involves socioemotional or cognitive skills as well as self-regulatory capacities, all of which are continually developing in young children (Gnepp & Hess, 1986; Kochanska, Murray, & Harlan, 2000).

One way in which to test children's use of display rules is with the disappointment paradigm pioneered by Saarni (1984). With this procedure, children are given a disappointing gift and then observed to see how much they try to dissemble or hide their disappointment. In studies involving this general method, children's reactions to disappointment have been linked to their social competence and adjustment. For example, Cole, Zahn-Waxler, and Smith (1994) found that at-risk preschool boys' angry reactions to disappointment predicted disruptive behavior as well as mothers' and teachers' reports of the boys' oppositionality, attention deficit problems with hyperactivity, and conduct problems. In contrast to boys, at-risk girls' minimization or suppression of negative emotion (particularly anger and sadness), even while alone (i.e., suppression of negative emotion when there is no need to do so), was associated with symptoms of attention deficit and conduct disorders. In a study of children 4½ to 7 years of age (Eisenberg et al., 2001), children with externalizing problems were likely to exhibit negative reactions to a disappointing prize. In contrast, children with internalizing problems were relatively likely to exhibit fewer negative reactions than did children with externalizing problems (especially girls). Finally, in a study on fourth graders, children (especially girls) who reacted positively rather than negatively to a disappointing gift were evaluated favorably (or less negatively) by their peers and teachers (McDowell, O'Neil, & Parke, 2000). Therefore, the overall pattern of findings suggests that children's masking of

disappointment in situations that usually call for such masking has been associated with their social competence (Garner, 1996; McDowell et al., 2000), low aggression (Underwood, Coie, & Herbsman, 1992), and socially appropriate emotional expression (Garner & Power, 1996).

In addition to contextual demands (or display rules) that call for the masking of disappointment, the way in which children react to emotional or social situations might be associated with their temperaments or personalities. Individuals enter the world with inclinations toward reacting or behaving in relatively consistent or predictable ways over time, with these inclinations being somewhat amenable to socialization or change. Such early and stable individual differences in emotional, attentional, and behavioral inclinations often are considered parts of temperament. Temperament taps a predisposition toward, but not the actual occurrence of, reacting or behaving in any given context. For example, children vary in how intensely or how long they tend to experience negative emotions (i.e., *negative emotionality*) (Rothbart, Ahadi, & Hershey, 1994; Rothbart & Bates, 1998), but whether such tendencies are expressed might depend on children's ability to manage their attention, emotions, or behaviors (e.g., *effortful control*) and on contextual demands called for by a given situation. *Effortful control* includes the ability or capacity to voluntarily inhibit a dominant response to activate a subdominant response (Rothbart et al., 1994; Rothbart & Bates, 1998); it appears to involve executive attention that exerts control on social cognition, emotional experience, and emotional expression (Derryberry & Rothbart, 1997). Undoubtedly, negative emotionality and effortful control are highly interrelated dimensions of temperament (Campos, Frankel, & Camras, 2004). However, a person could theoretically differ (i.e., have a natural tendency to be low or high) on each dimension, and measures of each generally load on separate factors (Rothbart, Chew, & Gartstein, 2001) and provide unique prediction of adjustment and social competence (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg et al., 2004). Thus, examination of both negative emotionality and effortful control could potentially provide stronger prediction of expressive behaviors and social functioning than can considering only one or the other.

Effortful control includes many capacities discussed by coping theorists (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Eisenberg, Fabes, & Guthrie, 1997) as well as by temperament theorists. Dispositional differences in self-regulation and emotion regulation could be attributed partly to effortful control (Derryberry & Rothbart, 1997; Eisenberg et al., 2004); the skills inherent in effortful control are used to regulate emotion and behavior associated with emotion, although the construct of effortful control does not assess whether children manage their emotions in specific situations. Although effortful control is expected to contribute to the modulation (e.g., maintaining, activating, inhibiting) of emotion-related activities in specific situations (Eisenberg & Spinrad, 2004), it also reflects individual or dispositional differences across situations (e.g., a general style of responding across a variety of different settings). Temperamental tendencies likely predispose or bias individuals to behave in certain ways, but the degree to which temperamental characteristics such as effortful control are expressed or manifested is believed to vary with the given context (and perhaps the individual).

In regard to the use of display rules, we expect effortful control to be especially important. As part of self-regulation, effortful control facilitates or allows for the willful shifting and focusing of attention as well as for the voluntary inhibition or activation of behavior (Eisenberg et al., 2000; Rothbart et al., 1994; Rothbart & Bates, 1998). For example, the dominant or primary response of a person who is experiencing disappointment would be to immediately express his or her sadness or anger. However, activating a subdominant or secondary response, such as inhibiting or neutralizing negative reactions (e.g., masking a frown, inhibiting the urge to scream or hit), or activating positive reactions (e.g., smiling) might be more socially appropriate or adaptive in certain contexts. Thus, effortful control often is involved in enacting display rules.

In general, children's effortful control or related measures of self-regulation have been positively associated with social competence and adjustment (e.g., Eisenberg et al., 1993; Kochanska & Knaack, 2003; Kochanska et al., 2000; see also Eisenberg et al., 2000), and negatively associated with negative emotionality (e.g., Eisenberg et al., 1993, 2000; Eisenberg, Fabes, & Murphy, 1995). However, few researchers have examined the association between negative emotionality or effortful control and the actual use of display rules or emotional dissemblance and dissimulation. In one relevant study, fourth graders who reported feeling negatively to emotionally charged situations tended to (marginally) express negative reactions to disappointment, whereas those who reported feeling angry or reported using sad coping strategies tended to express fewer positive reactions to disappointment (McDowell et al., 2000).

The purpose of this study was to examine whether the modulation of negative reactions (or dissimulation of positive reactions) during a situation that calls for a masking of negative reactions mediates the association of dispositional effortful control and anger with the quality of children's social functioning. By testing this indirect linkage, we hoped to increase our understanding of one potential mechanism underlying the empirically established linkage between children's dispositional characteristics (particularly those involving emotion and self-regulation) and social competence or adjustment (Rothbart & Bates, 1998). We hypothesized that individual differences in effortful control and low negative emotionality facilitate the minimization of negative reactions or activation of positive reactions in a situation that calls for the masking of disappointment. Furthermore, we hypothesized that individuals who minimized negative facial or verbal/gestural reactions and/or activated positive reactions in the presence of another person (or other persons) would be perceived as socially competent and well adjusted. Our hypotheses are consistent with the notion that dispositional or trait-like qualities contribute to situational or context-specific responses (Mischel, 1990) as well as to others' global perceptions of individuals' functioning in the social environment (Cole et al., 1994; Eisenberg, Guthrie et al., 1997). Moreover, expressive behaviors in a situation calling for the masking of negative reactions could be viewed as a demonstration of self-regulation (as inferred by behaviors consistent with the function of display rules; Cole, Martin, & Dennis, 2004). We expected the enactment of display rules and social competence to be linked because both involve responses that are rooted in the understanding of, and adherence to, social norms, customs, or conventions. For conceptual reasons, we also

hypothesized partial mediation rather than full or complete mediation. Specifically, we expected dispositional emotion-related characteristics, such as effortful control and proneness to anger, to have some direct effects on social functioning (or effects mediated by other factors) beyond those involved in the masking of disappointment. Masking disappointment in situations where doing so is called for is one—but not the only—mechanism by which self-regulation can influence social functioning. For example, effortful control and negative emotionality would be expected to contribute to a host of daily interactions or contextually bound behaviors, such as sitting still and paying attention in the classroom, not running around or throwing temper tantrums in stores, and keeping quiet during shows or movies, and these behaviors influence others' perceptions of a child's adjustment and social competence.

Sex differences have been found for children's reactions in situations that call for the masking of disappointment, with girls masking their negative reactions more than do boys (e.g., Cole, 1986; Davis, 1995; McDowell et al., 2000; Saarni, 1984). For example, for children as young as 3 years of age, Josephs (1994) found that girls smiled longer than did boys when they received a disappointing gift. However, sex differences were found primarily when a desirable gift was presented first, that is, when children were primed to expect a desirable gift (Josephs, 1994). In the current study, children did not receive a desirable gift prior to a disappointing gift. Thus, we were unsure whether we would observe pronounced sex differences in preschoolers' reactions or whether these would moderate the predicted pattern of relations.

Method

Participants

A total of 78 preschool children (38 girls and 40 boys, mean age = 4.87 years, $SD = 0.82$, range = 3.50–6.42) from seven classrooms of two university-affiliated preschools participated in peer sociometric ratings and nominations as well as in laboratory sessions. In addition, 19 children provided information on peer sociometric ratings and nominations only (they or their parents declined participation in other parts of this study). Most children were members of middle- or upper middle-class families (a few were likely children of graduate students with relatively lower incomes). Among the participants, 72% were Caucasian or European American, 13% were Hispanic American, 8% were Asian American, 4% were of mixed or multiple ethnicities, and 3% were African American. Originally, there were 79 participants, but 1 participant's reactions during disappointment were not videotaped due to human error. Because reaction to disappointment is a primary measure, we did not include that participant in analyses.

Procedure

Late in the school semester, parents (51 mothers and 4 fathers) and teachers completed measures of children's negative emotionality, effortful control, social skills,

popularity, and externalizing or aggressive behaviors. Two teachers rated all children in a classroom except for one class that had only a primary teacher. Peers reported on children's anger, prosocial behaviors, popularity, and externalizing or aggressive behaviors.

In individual experimental sessions, children were told that they would receive a small gift for their help with the peer nominations and sociometric ratings. Children ranked five potential gifts (attractive stickers, Post-It notes, a clothespin, a paper clip, and a baby's pacifier) from most to least liked. After ranking their preferences, children were interviewed to assess how much they liked each of their peers. In addition, children's negative emotionality (e.g., anger), prosocial behaviors (e.g., helping, being nice), and externalizing or aggressive behaviors (e.g., fighting) were assessed using peer nominations. After the sociometric interviews, children's reactions immediately after receiving a disappointing gift were observed. The experimenter presented the children with their least preferred gift (as selected early in the session) in a gift bag. After the children saw the gift, the experimenter (with neutral facial expression) maintained eye contact and remained silent with the children for 5 s (or longer if the children were in the midst of talking about or reacting to the gift). After 5 s, it was awkward for the experimenter to maintain eye contact while remaining still-faced and silent with the children if they said nothing, especially given that the gift was something that the children had explicitly ranked as least preferred earlier in the session. At the end of this task, the experimenter apologized for giving children the wrong gift and then gave them their most preferred gift.

Measures

Observational measures were used to assess children's initial reactions to disappointment. Using questionnaires or nominations, multiple informants (parents, teachers, and peers) reported on children's effortful control and/or negative emotionality as well as on their social competence/adjustment.

Children's immediate reactions to disappointment

After children saw their least preferred gift, their immediate affective and behavioral reactions were coded separately by two teams of coders. Each coding team consisted of a main coder and a reliability coder.

Affective responses during disappointment. Facial and vocal cues from videotapes, based on the work of Ekman and Friesen (1969), Izard (1977, 1978), and others, were used to detect general positive (e.g., joy), internalizing negative (e.g., sadness), and externalizing negative (e.g., anger) affects. Affective responses were coded for 5 s immediately after children first saw their gift in the presence of the experimenter. The main coder (who was unaware of the study's hypotheses) and the reliability coder scored all children's reactions. Both coders rated affective intensity on a 4-point scale (1 = none, 2 = low, 3 = medium, 4 = high) and rated duration on a 5-point scale (1 = never, 2 = some of the time, 3 = half of the time, 4 = most of the time, 5 = all of the time). Interrater reliabilities for positive intensity, positive duration, internalizing

negative intensity, internalizing negative duration, externalizing negative intensity, and externalizing negative duration were assessed with correlations, $r_s(76) = .74, .72, .61, .67, .67, \text{ and } .66$, respectively, $ps < .001$.

To capture intensity and duration simultaneously, ratings of intensity and duration for positive affective responses were standardized and then multiplied to construct a score for *general positive affect*. Composite scores for main and reliability coders were correlated, $r(76) = .78, p < .001$. For internalizing and externalizing negative affect, ratings of intensity and duration were averaged across each type of negative affect as a way in which to reduce the number of measures and increase reliability. Intensity ratings for internalizing and externalizing negative responses were averaged to arrive at a general negative intensity score (main and reliability scores were correlated, $r(76) = .73, p < .001$). Duration ratings for internalizing and externalizing negative responses were averaged in the same way to compute a general negative duration score (main and reliability scores were correlated, $r(76) = .74, p < .001$). The intensity and duration scores were multiplied to compute a score for *general negative affect* (main and reliability scores were correlated, $r(76) = .79, p < .001$). To adjust for the positively skewed scores for general negative affect, a square root transformation was conducted.

Verballgestural responses during disappointment. Children's initial actions after seeing the disappointing gift were rated for 5 s (or until actions or verbalizations that were in progress have been completed) on a 5-point scale (1 = *never*, 3 = *half of the time*, 5 = *all of the time*) by two coders using a behavioral coding scheme adapted from Cole et al. (1994). Actions that were coded included self-soothing behaviors (e.g., verbally reassuring self, rubbing hands, twirling hair), disruptive behaviors (e.g., throwing the gift, making rude remarks), and limit-testing behaviors (e.g., trying to leave the room, touching or hiding experimenter's pens or papers). In addition, verbal reactions of dissatisfaction with the gift were rated (using the same 5-point scale). The reliability coder rated 33 participants (41%), whereas the main coder rated all participants. Agreement between main coders and reliability coders was relatively high on self-soothing behaviors, disruptive behaviors, limit-testing behaviors, and verbalization of dissatisfaction, $r_s(31) = .77, 1.00, 1.00, \text{ and } .77$, respectively, $ps < .001$.

Data reduction of verballgestural reactions. For self-soothing behaviors, a square root transformation was conducted to adjust for negatively skewed scores. Only two children exhibited disruptive behaviors some of the time (rating of 2), and only one child exhibited limit-testing behaviors some of the time (rating of 2). Furthermore, these same three children verbalized dissatisfaction some of the time (rating of 2). Because so few children exhibited disruptive and limit-testing behaviors, these three children were assigned ratings of 3 (i.e., half of the time) on verbalization of dissatisfaction. Agreement between main raters and reliability raters for negative verbal/gestural reactions to disappointment (consisting of verbalization of dissatisfaction, disruptive behaviors, and limit-testing behaviors) was relatively high, $r(33) = .81, p < .001$. A log 10 transformation was conducted to adjust for the pos-

itively skewed scores for negative verbal/gestural reactions immediately following disappointment.

Children's negative emotionality

Adults (i.e., parents and teachers) and peers provided information on children's negative emotionality. Adults rated on a 7-point scale (1 = *never*, 7 = *always*) children's negative emotional intensity with five items (e.g., "When my child/this child gets nervous or distressed, he/she gets very nervous/upset") adapted from Larsen and Diener (1987; see also Eisenberg et al., 2000). Items were averaged (after reversing appropriate items) to compute scores for parents' and teachers' ratings of children's negative emotional intensity. Alphas were .76, .93, and .94 for parents, primary teachers, and assistant teachers, respectively. Primary and assistant teachers' scores were correlated, $r(60) = .64, p < .001$, and items were averaged across teachers and then averaged together ($\alpha = .94$).

In addition to negative emotional intensity, adults rated children's anger/frustration on a 7-point scale (1 = *extremely untrue*, 7 = *extremely true*) using 13 items (e.g., "gets angry when called in from play before he/she is ready to quit") from the Child Behavior Questionnaire (CBQ) (Goldsmith & Rothbart, 1991; Rothbart et al., 2001). Because the CBQ was originally designed for use with parents, some items were slightly modified for teachers. Alphas were .85, .94, and .95 for parents, primary teachers, and assistant teachers, respectively. Primary and assistant teachers' scores were correlated, $r(61) = .68, p < .001$, and items were averaged across teachers and then combined ($\alpha = .95$).

Peers reported on children's negative emotionality by nominating two classmates (i.e., first and second choices) who "get angry the most." Although some children or their parents declined participation in peer ratings and nominations, most children participated (mean percentage of participation = 81%, range = 67–100%). The experimenter randomly spread photographs of children on a table. Then, children's peers (individually) were asked to pick up the photograph of the child who "gets angry the most" (e.g., Price & Dodge, 1989). From the remaining photographs, the same procedure was repeated for the peer who gets angry the second most. In calculating scores for peer-reported anger, children received 2 points for each first choice and 1 point for each second choice (a score of 0 was assigned if children were not selected by peers). To adjust for the unequal distribution of boys and girls in each classroom, ratings were summed separately for same- and other-sex peer ratings, and each sum was divided by the number of same- or other-sex raters. The mean scores for same- and other-sex rated anger were averaged (because the numbers of boys and girls in each classroom were unequal) and then standardized within class to compute a score for peer-reported anger. Preschool children's peer ratings of anger have been related to adult-reported emotional intensity, low regulation, and high aggression as well as to peer-reported fighting (Maszk, Eisenberg, & Guthrie, 1999).

Children's effortful control. For children's effortful control, adults (i.e., parents and teachers) rated on a 7-point scale children's attentional shifting and focusing as well as inhibitory control (Rothbart et al., 1994). Adults rated 12 items for attention shift-

ing (e.g., “can easily shift from one activity to another”), but 1 of the 12 items (i.e., “often shifts rapidly from one activity to another”) was dropped for all reporters because it was negatively correlated with other items across all reporters. Alphas were .86, .88, and .92 for parents, primary teachers, and assistant teachers, respectively. For attention focusing (e.g., “has difficulty leaving a project he/she has begun”), parents rated 12 items ($\alpha = .76$) and teachers rated 11 items (α s = .90 and .93 for teachers 1 and 2, respectively), with 1 of the 12 items (i.e., “has difficulty leaving a project he/she has begun”) being dropped for teachers because it had a negative item–scale correlation. For inhibitory control (e.g., “can wait before entering into new activities if he/she is asked to”), adults rated children using 13 items (α s = .77, .91, and .95 for parents, primary teachers, and assistant teachers, respectively). There was moderate agreement between the primary and assistant teachers on attention shifting, attention focusing, and inhibitory control, r s(59) = .43, .51, and .66, respectively, p s < .001, so each item was averaged across teachers and then averaged across items (α s = .90 or higher for the three scales).

Data reduction of measures of negative emotionality and effortful control. To simplify and minimize the number of final analyses, data on negative emotionality or effortful control were reduced (using correlations or factor analyses) for each type of informant. For parents’ and teachers’ ratings, principal components factor analyses with a varimax rotation were computed separately. For parents, factor analysis yielded two factors: (a) negative emotionality (–.89), anger (–.89), and attentional shifting (.70) and (b) inhibitory control (.78) and attentional focusing (.88). For (primary and assistant) teachers, one factor emerged: negative emotionality (–.86), anger (–.90), attentional shifting (.89), attentional focusing (.76), and inhibition control (.91). For parents’ reports, attentional shifting was moderately associated with low negative emotionality (e.g., Rothbart, Ziaie, & O’Boyle, 1992) and sometimes loads on the same factor as does low negative emotionality (Eisenberg et al., 1995), perhaps because voluntarily shifting attention from an arousing or unpleasant stimulus is a self-regulatory or coping strategy. Based on results from factor analysis, composites using parents’ reports were computed for *low negative emotionality* (consisting of reversed negative emotionality, reversed anger, and attentional shifting) and *self-control* (consisting of inhibitory control and attentional focusing). Parents’ composite score for self-control was moderately skewed, so a square root transformation was conducted to adjust for skew. Because parents’ composites of low negative emotionality and self-control were significantly correlated, $r(54) = .40$, $p < .01$, parents’ ratings were standardized and averaged to compute a composite score for *emotion-related effortful control* (henceforth often labeled *effortful control*). Similarly, teachers’ ratings were standardized and averaged (after reversing negative emotionality and anger) to compute teachers’ ratings of emotion-related effortful control. Although we recognize that low levels of negative emotionality might not always reflect self-regulation, negative emotionality often has been used as an indirect index of emotion regulation (Cole et al., 2004) and the term *effortful control* succinctly captures the essence of the combination of self-regulation with low negative emotionality.

To be consistent with adults' reports (recall that negative emotionality and anger were reversed), peers' reports of anger were reversed (by multiplying reports by -1). Peers' reports of anger were positively skewed, and a log 10 transformation was conducted to adjust for its skew prior to reversing scores on anger.

Children's social competence and adjustment

As with measures of effortful control, multiple informants reported on children's social competence (e.g., socially appropriate or prosocial behaviors and popularity) and adjustment (e.g., externalizing or aggressive behaviors).

Adult-reported socially appropriate behaviors and popularity. To assess children's socially appropriate behaviors (i.e., social skills), adults completed four items adapted from Harter's (1982) Perceived Competence Scale for Children [e.g., "This child is usually well-behaved" vs. "This child is not well-behaved" (Eisenberg et al., 1995)] using Harter's 4-point response scale (i.e., selecting a statement and then indicating whether the item was "really true" or "sort of true") (α s = .72, .87, and .88 for parents, primary teachers, and assistant teachers, respectively). Popularity was assessed with three additional items from the same measure [e.g., "This child is popular with others his/her own age" vs. "This child is not popular with others his/her own age" (Eisenberg et al., 1995)] (α s = .81, .93, and .94 for parents, primary teachers, and assistant teachers, respectively). Scores for primary and assistant teachers were correlated for both socially appropriate behaviors and popularity, r s(60) = .56 and .45, p s < .001, so items were averaged across teachers and within each scale (α s for socially appropriate behavior and popularity = .88 and .94, respectively).

Peer ratings of prosocial behaviors and popularity. Using the same procedures as peer nominations of anger, children's peers nominated two classmates (i.e., first and second choices) who were nicest and, separately, who were most helpful. Same- and other-sex nominations for being nice and for being helpful were weighted so that first choices were multiplied by 2 and second choices were multiplied by 1. The weighted nominations were summed to compute separate scores for being "nice" and being "helpful" for same- and other-sex peers. Nice and helpful scores were each averaged across same- and other-sex peers and were standardized within each class (Eisenberg et al., 1993). Scores for being nice and helpful were correlated, r (79) = .48, p < .001, and were averaged to compute a composite score for peer-reported "prosocial behaviors."

Peers also provided ratings of popularity. Children viewed photographs of their peers (i.e., classmates) at random. The experimenter pointed to one of the photographs and asked children to identify the peer. After naming the peer, children indicated how much they liked to play with that peer (i.e., peer popularity) by placing the photograph in one of three baskets labeled with happy, neutral, and sad faces indicating that they liked to play with that classmate a lot, liked to play with that classmate a little bit, or did not like to play with that classmate at all, respectively. Ratings of "a lot," "a little bit," and "not at all" were weighted (i.e., multiplied) by 3, 2, and 1, respectively. The weighted scores were summed separately for same- and other-sex peer ratings, and each sum was divided by the number of same-

or other-sex raters. Same- and other-sex peer popularity scores were standardized and then averaged to compute a composite for peer popularity.

Externalizing and aggressive behavior. Parents and teachers rated children's externalizing problem behavior on a 4-point scale (1 = *never*, 4 = *often*) using the 24 items (e.g., "teases other children," "defiant toward adults," "breaks things on purpose") from Lochman's (1995) Child Problem Behavior Checklist. Alphas were .93, .97, and .96 for parents, primary teachers, and assistant teachers, respectively. Agreement between primary and assistant teachers was moderately high, $r(61) = .70$, $p < .001$, so scores for each item were averaged across teachers and then averaged together ($\alpha = .97$). In addition, peers reported on children's aggression (i.e., fighting). Peer-rated externalizing behaviors or aggression was computed in the same way as for peer-rated anger.

Data reduction for quality of social functioning data. To reduce the number of adults' ratings of children's quality of social functioning (i.e., socially appropriate behaviors/social skills, popularity, and externalizing problem behaviors), principal components factor analyses with a varimax rotation were conducted separately for teachers' and parents' ratings. For teachers' ratings, one factor emerged: socially appropriate behaviors/social skills (.95), popularity (.76), and externalizing problem behaviors (−.91). Teachers' ratings of popularity were positively correlated with their ratings of socially appropriate behaviors/social skills and were negatively correlated with problem behaviors, $r_s(78,77) = .60$ and $-.47$, respectively, $ps < .001$. For parents, factor analysis yielded two factors: (a) socially appropriate behaviors/social skills (.98) and externalizing problem behaviors (−.89) and (b) popularity (.98). Because ratings of popularity were not significantly correlated with social functioning for parents (or with teachers' ratings of children's popularity or social functioning), parents' ratings of popularity were not included in subsequent analyses as an indicator of children's social functioning.¹ For parents and teachers, scales were standardized and averaged to construct composites for *social competenceladjustment*.

For peers' ratings of children's social functioning, a principal components factor analysis with a varimax rotation was conducted on peer ratings of prosocial behaviors, popularity, and externalizing or aggressive behaviors. One factor emerged that included being nice (.77), being helpful (.77), popularity (.67), and externalizing or aggressive behaviors (−.58). Peer nominations were not derived from a continuous scale, so scores could not be reversed and combined. Thus, ratings on prosocial behaviors (i.e., being nice and being helpful) were averaged and then summed with popularity. Next, scores for externalizing problem behaviors were subtracted from the prosocial/popularity composite to arrive at a composite for *peer-reported social competenceladjustment*.

¹ Agreement between parents' reports of children's peer status and those from teachers or peers tends to be low given that the home and school contexts are very different (Rubin, Bukowski, & Parker, 1998). Teachers and peers likely observe children in peer groups, such as the classroom and playground settings (where peer status is salient), more often than do parents. In addition, parents might be more prone to social desirability biases than are teachers or peers when reporting on children's popularity or social status.

Table 1
Means and standard deviations

	Sample		Boys		Girls	
	Mean	SD	Mean	SD	Mean	SD
Effortful control/low negative emotionality						
Parent report	0.00	0.83	−0.10	1.03	0.09	0.60
Teacher report	0.00	0.88	−0.25	0.93	0.26	0.75
Peer report (anger)	0.00	0.95	0.13	1.07	−0.14	0.79
Reactions to disappointment						
Positive intensity	2.10	1.10	1.93	1.07	2.29	1.11
Positive duration	1.95	1.03	1.83	1.01	2.08	1.05
Self-soothing	3.99	1.05	4.05	0.93	3.92	1.17
Negative intensity	2.08	0.67	2.24	0.72	1.92	0.58
Negative duration	1.99	0.64	2.09	0.63	1.88	0.65
Negative verbal/gestural reactions	1.35	0.55	1.50	0.64	1.18	0.39
Social competence/adjustment						
Parent report	0.00	0.88	−0.10	1.03	0.09	0.73
Teacher report	0.00	0.88	−0.18	0.96	0.11	0.79
Peer report	0.00	2.06	−0.81	2.02	1.16	1.99

Note. Unstandardized means are presented for reactions to disappointment. Standardized means are presented for parents', teachers', and peers' reports because they are composite scores.

Finally, to further simplify final analyses, a principal components factor analysis was conducted on the composite scores for social competence for each type of informant (i.e., parents, teachers, and peers). A single factor emerged and included parent-reported (.68), teacher-reported (.87), and peer-reported (.81) social functioning. A composite score was computed for *social competence/adjustment* by averaging the standardized scores for parents', teachers', and peers' reports.

Results

Descriptive statistics

Means and standard deviations (for the overall sample as well as by sex) for the major variables are presented in Table 1. Unstandardized nontransformed scores generally are presented except when composite scores contained indexes with different units of measurement.²

² A structural equation model was computed with Mplus (Muthen & Muthen, 1998), in which the three latent constructs of dispositional effortful control with negative emotionality (parent and teacher reported), negative verbal/gestural reactions to disappointment (observed), and social competence/adjustment (parent, teacher, and peer reported) were correlated with one another. The model fit was adequate, $\chi^2(8, N = 78) = 13.83, p < .09, CFI = .96$. All variables that were not preset to 1 (via standard procedures) loaded at least marginally significantly on their respective constructs. All paths among constructs were significant and in the expected direction. Model results were consistent with correlations.

Relations of age with major variables

Correlations with age were conducted for all major variables. Age was significantly positively correlated with parents' reports of effortful control and with general negative affect during disappointment, $r_s(51, 75) = .28$ and $.27$, $p_s < .05$ and $.02$, respectively.

Relations of sex with major variables

Four multivariate analyses of variance (MANOVAs) were conducted to test whether boys and girls differed on (a) observed child measures (i.e., self-soothing, negative verbal/gestural reactions, and negative and positive affective reactions), (b) parents' reports (i.e., emotion-related self-regulation and social competence/adjustment), (c) teachers' reports (i.e., emotion-related self-regulation and social competence/adjustment), and (d) peers' reports (i.e., low anger and social competence/adjustment).

Table 2
Correlations among composite variables

Measure	1	2	3	4	5	6	7	8
Observed ratings ($n = 78$)								
1. Positive affect	—	.28* (.29*)	-.28* (-.27*)	.05 (.10)	-.05 (-.07)	-.20+ (-.27*)	-.09 (-.11)	-.09 (-.16)
2. Self-soothing		—	-.10 (-.15)	.12 (.10)	.06 (.02)	-.14 (-.18)	-.12 (-.11)	-.10 (-.12)
3. Negative affect			—	.30** (.25*)	.01 (-.05)	-.10 (-.12)	-.10 (.07)	-.09 (-.08)
4. Negative verbal/ gestural reactions				—	-.32* (-.35*)	-.36*** (-.34**)	.02 (.06)	-.26* (-.22+)
Parent reports ($n = 53$)								
5. Effortful control/low negative emotionality					—	.33* (.26+)	.04 (.04)	.50*** (.46***)
Teacher reports ($n = 77$)								
6. Effortful control/low negative emotionality						—	.43*** (.43***)	.76*** (.72***)
Peer reports ($n = 77$)								
7. Low anger							—	.46*** (.42***)
Parent/Teacher/Peer reports ($n = 79$)								
8. Social competence/ adjustment								—

Note. The numbers in each upper row are zero-order correlations, and the numbers in parentheses in each lower row are partial correlations controlling for the effects of children's age and gender.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

+ $p < .10$.

adjustment). There was a multivariate effect of sex on observed child measures, Wilks's $F(4, 73) = 2.46, p < .05$. Examination of the univariate effects indicated that boys exhibited marginally more negative affective reactions and significantly more negative verbal/gestural reactions during disappointment than did girls, $F_s(1, 76) = 3.59$ and $6.38, p_s < .06$ and $.02$, respectively. In addition, multivariate effects showed that boys and girls differed on teachers' and peers' reports but not on parents' reports, $F_s(2, 74; 2, 74; 2, 50) = 3.60, 7.04, \text{ and } 0.27, p_s < .03, .01, \text{ and } ns$, respectively. According to the univariate results, teachers rated girls as higher than boys on effortful control, $F(1, 75) = 6.56, p < .02$, whereas peers rated girls as higher than boys on social competence/adjustment, $F(1, 75) = 14.26, p < .001$.

Links among effortful control, immediate reactions to disappointment, and social functioning

Zero-order and partial correlations (controlling for the effects of age and sex) among children's effortful control, peer-reported anger, immediate reactions to disappointment, and social competence/adjustment are presented in Table 2. Because age and sex were related to several variables, we highlight findings based on partial correlations in our summary of findings.

Interrater agreement on composites of effortful control and anger

Partial correlations indicated that teachers' reports of effortful control were marginally positively related to reports from parents and were significantly related to peer-reported low anger (the former relation was significant in the zero-order correlations). However, parents' reports of effortful control were unrelated to peers' reports of low anger.³ In general, measures of self-regulation (e.g., effortful control) tend to be moderately related across reporters, but less so for measures of negative emotionality, particularly internalizing emotionality (Lemery, Essex, & Smider, 2002).

Relations between effortful control or anger and immediate reactions to disappointment

Effortful control (as reported by both parents and teachers) was associated with fewer negative verbal/gestural reactions during disappointment (Table 2). In addition, effortful control (as reported by teachers) was associated with fewer positive affective reactions. Neither parents' nor teachers' index of effortful control was associated with self-soothing or general negative affect (e.g., sad or angry facial expressions) in reacting to disappointment. Anger (as reported by peers) was not

³ Despite observing children in different contexts, parents' and teachers' perceptions of children's dispositional effortful control were similar (i.e., marginally associated with one another), suggesting some stability even across situations or contexts. As is usually found, agreement across contexts was higher for attentional/behavioral control than for negative emotionality. In addition, there was agreement between teachers' reports of effortful control and peers' reports of anger. Both teachers' and peers' reports tap aspects of negative emotionality when children are in the same context (i.e., at school). It is important to note that peers' reports of children's anger did not explicitly include measures of effortful control, which might have reduced the relation between peer-reported anger and adults' reports on the composite measure of effortful control and low negative emotionality.

significantly associated with any measures of children's immediate reactions to disappointment.

Relations between effortful control or anger and social competence/adjustment

All indexes of effortful control and anger were significantly linked to social competence/adjustment (Table 2).

Relations between immediate reactions to disappointment and social competence/adjustment

Of the affective and behavioral measures indexing immediate reactions to disappointment, only negative verbal/gestural reactions were associated with lower social competence/adjustment (significantly in the zero-order correlation and marginally in the partial correlation). Therefore, only negative verbal/gestural reactions were tested as potentially mediating the link between effortful control and social competence/adjustment.

Testing negative verbal/gestural reactions as mediator with regression analyses

To examine whether negative verbal/gestural reactions to disappointment mediated the link between effortful control and social competence/adjustment, we conducted regression analyses. Because age and gender were related to several variables, all regression analyses accounted for children's age and gender effects.⁴

We examined the hypothesized mediational effects with the test of joint significance of α and β (Cohen & Cohen, 1983; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) that tested whether a predictor variable (e.g., effortful control) is significantly related to a mediator variable (e.g., negative verbal/gestural reactions) and whether a mediator variable is significantly related to an outcome variable (e.g., social competence/adjustment) when controlling for a predictor variable. Joint significance would suggest evidence for (complete/full or partial) mediation. This method provides the most direct test of the simultaneous null hypothesis that path α and path β are

⁴ In four regression analyses, we examined whether age moderated the relations between parent- or teacher-reported effortful control and either negative verbal/gestural reaction or social competence/adjustment. In each regression, age and gender were entered in the first step, adult-reported effortful control was entered in the second step, and the multiplicative term was entered in the final step. Age was not a significant moderator in either regression for parent-reported regulation. In contrast, age significantly moderated the relations between teacher-reported effortful control and social competence/adjustment (but not negative verbal/gestural reactions), R^2 change for the final step = .03, $F(1, 72) = 4.64$, $p < .04$, unstandardized β for the interaction = .22. When mapped according to the procedures outlined by Aiken and West (1991), teachers' reports of effortful control were positively related to social competence/adjustment, but only for the oldest group of children (1 standard deviation above the mean age) and not for children of the mean age or 1 standard deviation below the mean age, slopes = .90, .72, and .54, $ps < .05$, ns , and ns , respectively. Additional regression analyses showed that age did not significantly moderate the relation between parent- or teacher-reported effortful control and all other measures of reactions to disappointment, or between measures of reactions to disappointment, or between measures of reactions to disappointment and social competence/adjustment.

both equal to 0. This test has at least .80 power to detect large effects at a sample size of 50 and has medium effects at a sample size of 100 (MacKinnon et al., 2002).

To test for mediation, two separate sets of regression analyses were conducted: one for teacher-reported effortful control and another for parent-reported effortful control. First, regression analyses were conducted to test whether effortful control significantly predicted immediate negative verbal/gestural reactions to disappointment in the presence of the experimenter (Table 3). Recall that other measures of affective or behavioral reactions were not tested as potential mediators because they were not significantly associated with social competence/adjustment. Second, regression analyses were conducted to test whether negative verbal/gestural reactions significantly predicted social competence/adjustment when controlling for effortful control. Both parent- and teacher-reported effortful control significantly predicted fewer immediate negative verbal/gestural reactions to disappointment (Table 3). Moreover, controlling for age and gender effects, immediate negative verbal/gestural reactions to disappointment in the presence of another person significantly mediated the link between parent-reported effortful control and social competence/adjustment; evidence for partial mediation was obtained because effortful control also significantly predicted social competence/adjustment in this regression. In contrast, negative verbal/gestural reactions did not significantly mediate the link between teacher-reported effortful control and social competence/adjustment.

Discussion

To our knowledge, this is one of the few studies to test the link between effortful control (which also included negative emotionality) and immediate or spontaneous

Table 3
Findings for regressions examining linear and mediation effects

Predictors and dependent variables	F for R^2 change for the final step	β
Parent-reported effortful control → Negative verbal/gestural reactions	$F(1, 49) = 6.62^*$	-.34*
Parent-reported effortful control → Negative verbal/gestural reactions → Social competence/adjustment	$F(2, 48) = 8.07^{***}$.31* (effortful control) -.28* (negative reactions)
Teacher-reported effortful control → Negative verbal/gestural reactions	$F(1, 73) = 8.91^{**}$	-.34**
Teacher-reported effortful control → Negative verbal/gestural reactions → Social competence/adjustment	$F(2, 72) = 39.19^{***}$.73*** (effortful control) .04 (negative reactions)

Note. Age and gender were entered in the first step in all regression analyses. In tests for mediation, the predictor and mediating variables were entered in the second (or final) step. Betas are the standardized coefficients from the final step. Composites for effortful control also included low negative emotionality.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

reactions to disappointment, and it is perhaps the only study to test whether the modulation (e.g., minimization, inhibition) of immediate negative reactions in a context that usually calls for masking of negative reactions is one mediating mechanism in the linkage between effortful control and social functioning. Although it was already clear that young children can effectively use display rules in a disappointing situation (e.g., Cole, 1986), our findings offer insight in regard to the origins of individual differences in young children's use of display rules and their social consequences.

Preschoolers' effortful control (as reported by both parents and teachers) was significantly associated with their minimization or masking of immediate negative verbal/gestural (but not facial) reactions in the presence of an unfamiliar adult who gave them a self-identified disappointing gift. Children who were relatively emotional and poorly self-regulated were likely to externalize their disappointment in ways that violated social norms (e.g., complained, acted out their disappointment). In contrast, self-regulated children who were low in negative emotionality might have recovered relatively quickly from their negative feelings (through attentional shifting and other cognitive processes) and controlled their immediate or initial verbal/gestural reactions of sadness, frustration, or anger (through inhibitory control). The association between effortful control and fewer verbal/gestural reactions to disappointment is consistent with McDowell et al.'s (2000) findings with older children in a study involving child report measures of emotional coping and emotionality.

Furthermore, verbal expressions of disappointment were associated with low effortful control (as reported by parents and teachers) even when not combined with disruptive or limit-testing behaviors, $r_s(49, 73) = -.38$ and $-.32$, $p_s < .007$ and $.006$, respectively. Some examples of children's negative verbal reactions include "I hate it," "I don't like it," "I don't want it," and "this is no good." Thus, the index of negative verbal/gestural reactions to disappointment in the presence of the gift giver (an unfamiliar adult) appears to reflect partly children's awareness of, and partly children's ability to implement, display rules (when defined as including verbal as well as nonverbal behavior). Modulation or minimization of negative verbal/gestural responses may partly reflect some understanding that it is socially inappropriate to complain about a gift even if the gift is disappointing (e.g., Underwood et al., 1992) and may partly reflect the capacity for emotional self-regulation when experiencing negative emotion.

Interestingly, children's negative affective (i.e., facial and vocal) reactions during disappointment were not significantly associated with effortful control. Perhaps the disappointing gifts used in this study (i.e., a paper clip, a clothespin, Post-It notes, attractive stickers, and a baby's pacifier) were mildly disappointing and, consequently, elicited relatively mild facial reactions among most preschool children. Indeed, children's negative affective reactions for intensity and duration ($M_s = 2.08$ and 1.99 , $SD_s = 0.67$ and 0.64 , respectively) indicate that their reactions were moderate or mild. But when we considered intensity without duration, 51.3% of children exhibited moderate intensity and 10.3% exhibited high intensity of negative affect, whereas only 7.7% of children exhibited no negative reactions. Given that the majority of children (61.6%) exhibited at least moderate intensity of negative affect, it is

likely that those who experienced at least moderately intense negative emotions, but could not self-regulate such emotions, were the ones who externalized their disappointment (e.g., complained, made gestures). Auxiliary analyses showed that children who expressed no negative effect or low-intensity negative affect exhibited significantly fewer negative verbal/gestural reactions than did those who expressed moderate- or high-intensity negative affect, $F(1, 76) = 4.17, p < .05$. It might be easier to inhibit verbal and behavioral reactions to negative emotion than the initial affective (e.g., facial) display itself; therefore, young children's attempts at masking were evident primarily in their verbal behavior and actions.

Effortful control (as reported by parents and teachers) and the modulation or minimization of negative verbal/gestural reactions (immediately following disappointment in the presence of an experimenter) both were associated with social competence/adjustment (as reported by parents, teachers, and peers). Our findings in regard to effortful control are consistent with previous research demonstrating that well-regulated, less negative children are viewed as socially competent and low in externalizing or aggressive behaviors (Caspi & Silva, 1995; Rothbart et al., 1994; for a review, see Eisenberg et al., 2000). Moreover, some of the negative verbal/gestural reactions (particularly the instances involving disruptive or limit-testing behaviors) resembled aggressive or defiant behaviors. In normative or typical samples, such behaviors rarely occur. In the current study, only three children exhibited disruptive behaviors and one child exhibited limit-testing behaviors. For example, one child pounded and smashed the disappointing gift with his fist and then threw it. Another child said "it's stupid" and then ordered the experimenter to "make sure you get the right one." Children who externalize their negative emotions in socially inappropriate, disruptive, or aggressive ways might be especially at risk for social disapproval or rejection and for being perceived by others as lacking social skills or maladjusted (e.g., Rubin et al., 1998).

Consistent with our predictions, it appeared that the link between effortful control (as reported by parents) and social functioning was partially, but not fully or completely, mediated by negative verbal/gestural reactions to disappointment. Moody and poorly self-regulated children appeared to be likely to immediately verbalize or act out their disappointment, which in turn predicted perceptions of low social competence and poor adjustment. Thus, dispositional or temperamentally based differences in children were reflected in observed reactions to a specific mildly disappointing situation (which usually calls for masking of negative reactions). Although cause and effect cannot be determined from correlational data, our findings support the notion that individual differences in negative emotionality and self-regulation are reflected in the degree to which children act or react in ways that are consistent with their understanding of social norms embedded in specific contexts. Partial mediation also suggests that effortful control (with low negative emotionality) continued to be linked to children's social competence and adjustment in a variety of settings (not only those calling for use of display rules or modulation of negative reactions). Thus, the current study demonstrated that the use of display rules may be one mechanism by which dispositional effortful control and negative emotionality are linked to social competence and adjustment. Future studies should

explore and identify other social behaviors and contexts as potential mediating mechanisms in the link between self-regulation and social functioning. For example, the modulation or minimization of positive affect, such as laughter (in situations where there is a need to be solemn or serious), might be explored.

Mediation of the relations between effortful control and social competence/adjustment was found with parents' information but not with teachers' information (or with peer-reported low anger). One plausible explanation is that the index of effortful control was less strongly related to social competence/adjustment for parents than for teachers. Teachers' reports of effortful control were so strongly related to the social competence/adjustment composite that it was likely difficult for any non-teacher report (e.g., observed) variable to mediate the relations between the two. Alternatively, parents and teachers observe children in very different contexts. Parents likely have more opportunities to observe their children in situations with strangers or unfamiliar adults (e.g., at stores, in the streets) or in dyadic interactions. In contrast, teachers likely see and know children primarily in group situations, such as classrooms and playgrounds, where children interact with familiar peers (and rarely with unfamiliar adults). Given that the experimental session involved an experimenter (i.e., an unfamiliar adult) interacting with children in a dyadic (or face-to-face) situation, parents' ratings of children's effortful control might provide subtle information that teachers' ratings did not.

Unexpectedly, children who exhibited positive affective reactions (e.g., smiled, laughed) during disappointment were likely seen by their teachers as low on effortful control and low on social competence/adjustment. Because positive affect often accompanied self-soothing (including fidgeting) during disappointment, we speculate that some children who exhibited positive affect were experiencing uncertainty (including ambivalence) and distress. In other words, some children might have shown positive affect because they were feeling uncomfortable, not because they were using a display rule. Indeed, there are different kinds of smiles or laughter that signal different meanings (Ekman & Friesen, 1969; Ekman, Friesen, & O'Sullivan, 1988). During times of uncertainty or distress (especially during face-to-face encounters), some people engage in nervous laughter or giggling. Auxiliary analyses indicated that 45 of the 78 children (57.7%) in our sample showed at least some positive affect during the 5 s period. Furthermore, 41 of these 45 children (91%) also showed at least some low-intensity negative affect during the 5 s period. If some of the children who showed positive affect (coupled or accompanied by negative affect) were experiencing distress or discomfort, it makes sense that teachers saw such children as low on effortful control and low on social competence/adjustment. In light of the existence of such transitional expressions or blends of negative and positive expressions that usually suggest uncertainty (Saarni, 1984), such an association between effortful control or social competence/adjustment and positive affect is not entirely surprising. Our videotapes of children's faces sometimes were not sufficiently clear to code real versus feigned or blends of positive affect; thus, this issue merits attention in future studies.

This study had several limitations. First, baseline measures of children's emotional expressivity were not observed in the current study, and future studies could

include such observations prior to the disappointment task (during a relatively neutral face-to-face interaction with an experimenter) as a way in which to assess and account for baseline expressivity. Second, the sample size for this study ($N = 78$) was relatively small and limited the power of the analyses. Moreover, children in this study were recruited from middle- and upper middle-class preschools and might not represent children in different socioeconomic circumstances. Because norms and display rules differ across contexts or cultures, such factors partially define what behaviors are appropriate or adaptive. Clearly, variables such as cultural, ethnic, and socioeconomic background should be explored as potential factors that directly or indirectly influence children's emotion-related self-regulation, understanding and adherence to social norms/emotional display rules, and/or social competence and adjustment in future studies (Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998). Finally, it was impossible to demonstrate causal relations with concurrent data. To better understand the direction of influences among children's dispositional effortful control and negative emotionality, contextually bound expressive behaviors, and social functioning, future studies might assess young infants' or toddlers' temperaments and their situational responding and social competence or adjustment when these infants become preschool-aged.

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