

Emotional Self-Regulation in Preschoolers: The Interplay of Child Approach Reactivity, Parenting, and Control Capacities

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This study examined whether child temperamental approach reactivity moderated the association between 2 factors, parenting and child control capacities and child emotional self-regulation. Participants ($N = 113$) were 3- and 4-year-olds ($M = 48$ months, $SD = 5.78$) and their mothers. Emotional self-regulation was measured as observed persistence and frustration and as maternal report of compliance. Parental approach, avoidance, control, and warmth were observed during play and a frustrating wait. Child approach reactivity and control capacities (inhibitory control and soothability) were assessed via maternal report. Results suggested that maternal approach during the wait was associated with persistence and frustration, whereas maternal warmth during the play was associated with compliance. These effects, and those of child control capacities, depended on the level of child approach. The implications of reactivity-control interactions and parent-child goodness-of-fit for emotional self-regulation are discussed.

Keywords: emotional self-regulation, approach/avoidance, goodness-of-fit, reactivity and control process interactions

During the preschool years, advances in several core capacities transform children's behavior and emotion. Of these, emotional self-regulation is one of the most crucial. It reflects the ability to initiate behavioral and emotional changes during emotionally charged situations in order to meet goals and manage arousal and predicts current and later adjustment (Denham, 1998; Kopp, 1982; Saarni, 1999; Shoda, Mischel, & Peake, 1990). In early childhood, persistence during challenges, frustration tolerance, and compliance with caregiver demands are hallmarks of successful emotional self-regulation (Eisenberg et al., 2001; Kochanska, 1993).

Findings from diverse disciplines in psychology suggest that emotional self-regulation emerges out of the interplay between two powerful sets of influences: *reactivity*, or arousability of physiological, emotional, and behavioral systems, and *control* processes, or modulation of reactivity to meet goals (Carver, Sutton, & Scheier, 2000; Derryberry & Rothbart, 1997; Davidson & Fox, 1989; Davidson et al., 2002; Fox, 1994; Posner & Rothbart, 2000). Among the most fundamental dimensions of reactivity are approach and avoidance in response to novel, unfamiliar, and challenging situations. Approach reflects sensitivity to rewards, emotional exuberance and excited anticipation for pleasurable activities, and behavioral approach to novelty and challenge. In contrast, avoidance reflects sensitivity to potential threats, fear and shyness, and behavioral withdrawal and inhibition in response to novelty and challenge (Carver, 2004; Derryberry & Rothbart, 1997; Kagan, 1999; Panksepp, 1998). Approach and avoidance likely represent separable but interacting systems rather than a continuum of reactivity, given evidence of distinct neurological and psychological underpinnings (e.g., Coan, Allen, & Harmon-

Jones, 2001; Davidson, 2000; Derryberry & Rothbart, 1997; Fowles, 1994; Fox, 1994; Gray & McNaughton, 2000; Panksepp, 1998; Wacker, Heldmann, & Stemmler, 2003) and differential patterns of self-regulation and adjustment in adults (e.g., Carver et al., 2000; Elliot & Thrash, 2002; Higgins, 1997). However, the child development literature has shown a strong research emphasis on avoidance reactivity and a concomitant empirical neglect of approach reactivity. Even less research has focused on the interplay between approach reactivity and control capacities for predicting child emotional self-regulation. The goal of the current study is to address this gap by testing whether control processes, both internal and external to the child, predicted emotional self-regulation differently for children relatively low versus high in approach. This study targeted preschoolers because children at this age are rapidly developing independent regulatory capacities but are still relying on external sources of support.

Approach/Avoidance and Parental Goodness-of-Fit

The study of approach and avoidance reactivity in childhood primarily has been the domain of child temperament researchers. Their work has extensively focused on behavioral avoidance, inhibition, and withdrawal and demonstrates that children who are relatively fearful in response to novelty show a range of regulatory strengths, such as compliance and frustration tolerance, as well as vulnerabilities, such as behavioral withdrawal, anxiety, and social wariness (e.g., Fox et al., 1995; Kagan, 1999). However, this depends on how that reactivity is modulated and controlled both by external and internal factors (Calkins, Fox, & Marshall, 1996; Fox & Calkins, 2003; Fox et al., 1995; Rothbart & Bates, 1998; Schmidt, Fox, Schulkin, & Gold, 1999).

In infancy and early childhood, parenting is among the most critical external influences on child reactivity, particularly in relation to emotional self-regulation (Calkins & Johnson, 1998; Der-

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ryberry & Rothbart, 1997; Kopp, 1982). For example, parenting practices promote compliance differently for preschool children varying in temperamental avoidance/fearfulness (Kochanska, 1995, 1997, 2002). For relatively fearful children, low maternal control promotes compliance by capitalizing on the spontaneous internal discomfort fearful children experience to actual or potential threat or wrongdoing. In contrast, for relatively fearless children, who have a higher threshold for arousal, a mutually positive and warm parent-child relationship promotes compliance by optimizing positive motivation.

This research demonstrates that child emotional self-regulation is influenced by the balance between avoidance reactivity and aspects of parenting that serve to modulate that reactivity. It is thus a prime example of goodness-of-fit, the principle that socialization effects depend on child temperamental characteristics (Dienstbier, 1984; Kochanska, 1997; Rothbart & Ahadi, 1994; Thomas & Chess, 1977). Very little, on the other hand, is known about goodness-of-fit between parenting and child approach and the implications of this for emotional self-regulation. It is clear that approach reactivity is linked both to strengths and vulnerabilities. For example, reward sensitivity can motivate persistence, particularly when a task is not engaging (Peake, Hebl, & Mischel, 2002). On the other hand, focus on rewards can be detrimental if children have difficulty regulating the desire to win, obtain a reward, or participate in a fun activity. They may appear easily frustrated and have difficulty maintaining goal-directed behavior during challenges (Calkins & Fox, 2002; Cole, Martin, & Dennis, 2004; Fox, 1994; Harmon-Jones, 2003; Higgins, 1997). Therefore, parenting which serves to modulate child approach reactivity could have a powerful influence on emotional self-regulation.

Given current attention to and debate on the underpinnings and implications of approach motivation, there is a great need for studies examining child approach reactivity and goodness-of-fit with parenting (Carver, 2004; Fowles, 1994; Harmon-Jones, 2003; Harmon-Jones et al., 2004). However, relatively little research has targeted child approach, and despite painstaking research on approach and avoidance in adulthood (Carver, 2004; Costa & McCrae, 1988; Higgins, 1997; Sutton & Davidson, 1997; Zuckerman, 1994), there is a conspicuous lack of attention to how approach and avoidance are reflected in parenting.

Parental Approach/Avoidance

From the perspective of motivation and self-regulation theory, parental approach and avoidance are important mechanisms in the socialization of emotional self-regulation because they influence the degree to which children focus on rewards or threats when self-regulation is required (Carver, 2004; Grusec, Goodnow, & Kuczynski, 2000; Higgins et al., 1998; Higgins & Silberman, 1998; Manian, Strauman, & Denney, 1998). This research suggests specific ways of characterizing parental approach and avoidance. Parental approach refers to behaviors that serve to increase child reward sensitivity, such as emphasizing and anticipating rewards and positive outcomes. In contrast, parental avoidance refers to behaviors that serve to increase threat sensitivity, such as emphasizing and anticipating threats, problems, and compromised safety. Thus, parental approach and avoidance emphasize distinct caregiver goals, success and safety respectively, and shape child emo-

tional self-regulation by promoting reactive tendencies toward reward or threat.

Very few studies have tested the adequacy of these dimensions for describing meaningful aspects of parenting, but there are several suggestive exceptions. For example, self-reported parental approach and avoidance has predicted distinct patterns of emotion in parents and teenagers (Higgins & Silberman, 1998). In another study, adults' recollections of maternal approach and self-report of positive and negative temperament predicted self-regulation focused on rewards or threats (Manian et al., 1998). However, this research was limited by self-report and retrospective methodology and did not examine goodness-of-fit with child temperament. To my knowledge, there are no studies specifically linking observed parental approach and avoidance with observed child emotional self-regulation that take child temperament into account.

It is important to distinguish parental approach and avoidance from other, more familiar parenting constructs in the literature in order to establish them as unique parenting dimensions (e.g., Baumrind, 1967, 1971; Maccoby, 1992). Socialization research has gravitated toward two-dimensional classifications of parenting that converge around notions of warmth and control, including responsiveness-unresponsiveness and controlling-noncontrolling (Maccoby & Martin, 1983), as well as more fine-grained descriptions of parental control, such as direct commands and indirect guidance (Baumrind, 1967; Gray & Steinberg, 1999; Houck & LeCuyer-Maus, 2002, 2004). Approach and avoidance are orthogonal to these dimensions in that both parental approach (e.g., discussing potential rewards) and avoidance (e.g., warning about negative outcomes) can be warm or controlling. However clearly distinguishing these dimensions and determining points of overlap and separation requires that parental approach and avoidance be assessed alongside warmth and control.

Moreover, it is important to distinguish among these dimensions because each of these parenting dimensions may be linked to distinct child regulatory strengths and vulnerabilities. Parental approach promotes child behavior aimed toward obtaining rewards, such as persistence, but as reviewed above for approach reactivity, this focus on rewards might be linked to greater frustration when rewards are blocked. In contrast, parental avoidance promotes withdrawal and avoidance of potential negative outcomes and thus might be linked to less persistence and more distress during emotional challenges (Higgins, 1997; Carver, Sutton, & Scheier, 2000). The parenting dimensions of control and warmth have been associated with other aspects of child emotional self-regulation, such as compliance with caregiver directives. Warmth is typically linked to greater compliance and control to reduced compliance, perhaps because of reductions in opportunities for children to independently test and internalize regulatory strategies (Kochanska, 1997). On the other hand, for certain children, control that is clear and low-power assertive might be associated with greater social skills (Houck & LeCuyer-Maus, 2002, 2004; Kochanska, 1997; Kopp, 1982).

Indeed, the notion of goodness-of-fit specifies that the aims and impact of parenting practices vary according to child characteristics such as temperament (Grusec & Goodnow, 1994; Grusec et al., 2000; Grusec & Kuczynski, 1980; Kochanska, 1997; Maccoby, 1992). Parenting that serves to modulate child approach reactivity could have a powerful influence on emotional self-regulation. Children showing relatively low levels of approach may be less

internally motivated and thus pull for greater parenting intervention and be more sensitive to the regulatory costs and benefits of parenting. Children who are more approachful, on the other hand, might pull for fewer parenting interventions. This may result in reduced parenting impact, or if the parent is also highly approachful, amplification of child approach reactivity and related regulatory skills, such as persistence. In summary, it is likely that the fit between parenting and child approach reactivity is relevant to child emotional self-regulation beyond the impact of specific parenting strategies.

Context

Goodness-of-fit also varies with contextual factors (Grusec et al., 2000; Smetana, 1995). For example, emotional challenges versus play make distinct demands on parents and children and lend unique meaning to behavior. Emotional challenges may prompt parenting strategies that serve as a basis for child internalization of regulatory strategies. Thus, parenting during an emotional challenge might be most closely related to child emotional self-regulation during challenges. Since parental approach and avoidance are particularly relevant to child internalization of regulatory strategies (Higgins, 1996, 1997), approach and avoidance during an emotional challenge might show these effects most strongly. In contrast, parenting during play partially determines child opportunities to explore, relate to others, take the lead, and follow directives and thus might be most closely related to child ability to regulate behavior and emotions in social contexts, marked by skills such as cooperation with others and compliance with caregiver standards. Parenting warmth and control have been highlighted as important determinants of child compliance and conscience development (Kochanska, 1997), and thus these aspects of parenting during play might show the strongest ties with child compliance as a measure of emotional self-regulation.

Child Control Capacities

As children age, their reliance on external sources of regulation, including parents, decreases as internal regulatory capacities such as inhibitory control and soothability mature (Kochanska, Tjebkes, & Forman, 1998; Kopp, 1989; Lezak, 1995; Pennington & Ozonoff, 1996; Posner & Rothbart, 2000; Rothbart, Ahadi, & Evans, 2000). *Inhibitory control* is an executive function that is defined as the ability to effortfully inhibit undesired approach behavior. Children who can inhibit attention and behavior directed toward a desired but prohibited item show greater conscience (Kochanska, Murray, & Coy, 1997) and are perceived by their parents as more socially skilled and better able to manage negative emotions (Shoda et al., 1990). *Soothability*, the ability to recover from emotional distress and arousal, also makes a critical contribution to self-regulation. It is clear, for instance, that quickly recovering emotional equilibrium after experiencing frustration during an emotional challenge promotes effective coping with stressors and reductions in distress (Posner & Rothbart, 2000). These control capacities are poorly developed in children showing dysregulated emotional behavior and appear to be linked to the maturation of brain regions associated with executive control, such as the prefrontal cortex and anterior cingulate cortex (Brophy, Taylor, & Hughes, 2002; Hughes, Dunn, & White, 1998; Pennington &

Ozonoff, 1996; Posner & Rothbart, 2000). Any examination of parenting influences on child emotional self-regulation must take these child control capacities into account.

Few studies have examined whether links between child control capacities and emotional self-regulation vary with approach reactivity. Like parenting, control capacities serve to modulate approach reactivity (Derryberry & Rothbart, 1997). Highly approachful children are by definition more reactive to blocked rewards. Therefore, during frustrating tasks, inhibitory control and soothability could reduce frustration and increase persistence and compliance. This is consistent with one study in which inhibitory control predicted later social competencies in preschoolers, but only if children were highly approachful (Fox & Henderson, 2000). On the other hand, relatively high-approach children might harness this stronger reactivity in the service of persistence when rewards are blocked, and thus benefit little from the modulation of reactivity by control capacities. Children with weaker approach reactivity might benefit similarly from inhibitory control and soothability during frustrating tasks. However, different patterns could emerge, either because these children have less reactivity to modulate, or because they have already successfully obtained regulatory control. In sum, both inhibitory control and soothability likely contribute to a range of regulatory competencies in children varying in approach, but few studies have examined this question.

The Present Study

This study examined a unique question: *Are there different predictors of emotional self-regulation for children relatively low and high in temperamental approach?* This question builds on and expands previous research on child emotional self-regulation, goodness-of-fit, and the interplay between reactivity and control by (a) focusing on child temperamental approach reactivity; (b) examining parental approach and avoidance along with more typically studied dimensions of control and warmth; (c) evaluating interactions between child approach reactivity and child control capacities, inhibitory control and soothability; and (d) assessing context effects.

Child emotional self-regulation was measured as observed persistence and frustration and maternal report of compliance with caregiver demands, all widely cited as hallmarks of emotional self-regulation in early childhood. Parenting was observed during a free play and a frustrating task in which children waited for a desired present while mothers completed paperwork. In order to distinguish effects of parental approach and avoidance from those of control and warmth, measures of each were included.

It was predicted that parenting strategy and context would be associated with specific aspects of child emotional self-regulation: (a) parental approach and avoidance, particularly during the waiting task, would be associated with persistence and frustration; (b) parental warmth and control, particularly during the free play, would be associated with maternal report of compliance; and (c) effects would vary depending on child approach reactivity, with the greatest effects emerging for children relatively low in approach. In addition, the interplay between child control capacities and approach reactivity in relation to emotional self-regulation was examined.

Method

Participants

A sample of 120 predominantly Caucasian (83%) 3-year-olds (M age in months = 42.63, SD = 3.49; range: 36–47 months) and 4-year-olds (M age in months = 52.98, SD = 3.05; range: 48–59 months) and their mothers participated in a larger study of emotional self-regulation. Four of these dyads never participated in the lab visit, but mothers reported on child temperament. Of this sample (N = 116), temperament data were missing for two 3-year-olds and one 4-year-old. These participants and their mothers were excluded from the present study, leaving a sample size of 113 (58 boys and 55 girls). Of these, 57 were 3-year-olds (29 boys and 28 girls) and 56 were 4-year-olds (29 boys and 27 girls). Mean family income was \$58,494 (SD = \$28,277) and ranged between \$20,000 and \$200,000. All mothers were college graduates.

Children and their mothers were recruited through advertisements and fliers distributed in local newspapers and posted on day care and preschool bulletin boards in a small city in central Pennsylvania. A team of undergraduate research assistants was trained to conduct laboratory sessions. Another group of four coders, unaware of study hypotheses and never having interacted with the families prior to rating mother–child behavior, reviewed videotaped recordings of the sessions to generate data for analyses. Two of these research assistants coded maternal behavior and the remaining two coded child behavior.

Each preschooler and mother spent approximately 90 min in the laboratory room for young children as part of a larger collaborative study. Coding of parenting and child persistence and frustration were unique to the current study. Mothers completed the Child Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994) before arriving and completed the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) while the child was with the experimenter. Following introduction to the novel laboratory room and experimenter, the following tasks were used in the present study.

Child Temperamental Approach/Avoidance Reactivity and Control Capacities

Mothers completed the 195-item CBQ, designed to assess temperament for children ranging in age from 3 to 8 years. Mothers rated their children on a 1–7 Likert-type scale. The questionnaire yields 15 temperamental scales and several higher order dimensions. Scale scores were calculated as the average item response based on the developers' guidelines. The Approach (α = .82), Avoidance (α = .85), Inhibitory Control (α = .78), and Soothability (α = .78) scales were examined in this study. Approach measures excitement and positive anticipation for rewards and pleasurable activities, Inhibitory Control measures the capacity to plan and suppress inappropriate approach responses, and Soothability measures the rate of recovery from distress, excitement, and general arousal. Avoidance was calculated as the average of the Shyness and Fearfulness subscales. Approach was not significantly correlated with Avoidance (r = .07), underscoring the independence of these two dimensions. The CBQ has well-established internal consistency, validity, and test–retest reliability (Rothbart, Ahadi, Hershey, & Fisher, 2001).

Parenting

Procedures. Parenting was observed during a free play and waiting task, each 8 min long. In the free play (FP), mothers and preschoolers were given toys and told to play with them together. This procedure took place after the mother and child had been separated for approximately 25 min.

The waiting task (WT) was designed to elicit child frustration and allow for observation of parenting (Carmichael-Olsson, Greenberg, & Slough, 1985; Cole, Teti, & Zahn-Waxler, 2003). Before the WT began, the experimenter handed the mother papers to complete, gave the child a

broken toy, and left an attractively wrapped surprise on the table. The mother, who had been previously instructed, told the child, "This is a surprise for you but you must wait until I finish my work to open it." The mother was free to interact with her child as she wished. The WT finished with the child's opening and playing with the prize (magnetic marbles).

Data coding and reduction. The parenting coding scheme was developed for this study by Tracy Dennis-Tiwary (Dennis & Cole, 2001) and was based on previous literature on parenting and on approach and avoidance in adults (e.g., Higgins, 1997; Higgins & Silberman, 1998; Kochanska, 1997). Maternal behaviors were coded for approach, avoidance, control, and warmth during the FP and WT. Behaviors that did not conform to operational definitions were labeled *noncodable* and not analyzed and accounted for approximately 4% of the observed behaviors. Within each 10-s interval, maternal behavior and verbalizations were coded in sequence, and frequencies were calculated. Codes were mutually exclusive, so mothers were assigned one code per behavior, with the exception of warmth, which was coded independently of behavioral codes. Approach was measured as focusing on the positive, including showing affection, praising achievement and rule adherence, and talking about desired or happy events. Avoidance was measured as focusing on the negative, including empathizing with child negative emotion and talking about failure and undesired or unhappy events. Control was measured as the sum of behaviors reflecting mothers' attempts to direct child activity through guiding, structuring, and critiquing: (a) *guiding toward competence* refers to directing the child to work on a task, showing the child how to do the task, and making constructive suggestions to support achievement; (b) *encouraging appropriate behavior* refers to calling attention to unsafe or noncompliant behavior, prohibiting behavior, and making references to rules and negative consequences; (c) *critiquing* refers to expressing disappointment or criticizing when the child fails to meet expectations. Warmth was measured as the frequency of positive affect (laughter, smiling, physical affection, and lilting vocal quality) that was synchronized with child positive affect. See Table 1 for coding item examples and Table 2 for descriptive statistics.

Interrater agreement. Two coders were trained to code parenting by using practice videotapes until they reached 75% agreement. Reliability

Table 1
Examples of Maternal Control, Approach, and Avoidance Coding Items

Maternal Code	Example
Control	
Guide toward competence	"Show me how it works" "Try putting the puzzle piece in another spot" "Let's try this one instead"
Encourage appropriate behavior	"Be careful" "You have to wait until I finish - that's the rule" "If you do that, the lady is going to be mad"
Critiquing	"I'm sad that you're not listening to me" "You're being very disobedient"
Approach	
Focus on the positive	"You really like this game" "When we get home, we can have a snack" "This toy isn't so bad" "You are so smart"
Avoidance	
Focus on the negative	"It's really hard to wait, isn't it?" "Oh, the little train looks sad" "You keep on dropping your puzzle piece"

Table 2
Descriptive Statistics for Maternal and Child Variables

Maternal variable	Free play			Waiting task		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Approach	9.45	6.01	0–30	2.46	2.82	0–16
Avoidance	4.96	3.64	0–15	2.96	3.22	0–20
Control (Total)	58.32	20.30	11–119	24.92	14.64	1–89
Guiding toward competence	57.61	20.00	11–119	23.92	13.46	1–64
Discouraging inappropriate behavior	2.09	2.52	0–12	5.56	5.55	0–27
Critiquing	0.04	0.19	0–2	0.07	0.76	0–8
Warmth	12.04	9.93	0–17	4.04	4.10	0–17

Child temperament and outcome variable	<i>M</i>	<i>SD</i>	Range
Approach	5.22	0.67	3.38–6.77
Avoidance	3.71	0.91	1.65–6.20
Inhibitory control	4.65	0.70	2.54–6.54
Soothability	4.86	0.70	2.08–6.15
Persistence (average of <i>z</i> scores)	0	0.69	–2.09–1.21
Task engagement (raw score)	2.64	0.80	1.00–4.00
Seconds before interrupting (raw score)	107.85	48.06	3.50–195.00
Seconds spent working (raw score)	151.73	36.74	8.00–199.50
Frustration (average of <i>z</i> scores)	0	0.78	–1.03–2.48
SSRS Compliance	12.73	2.32	8.00–18.00

Note. Maternal control is computed as the sum of guiding toward competence, discouraging inappropriate behavior, and critiquing; persistence is calculated as the average of *z* scores for task engagement, seconds before interrupting, and seconds spent working on task. SSRS = Social Skills Rating System.

was then calculated on the basis of 20% of the videotapes (23 tapes), randomly chosen. The average percent agreement was 86% (ranging from 73%–95%), and the average Cohen's kappa coefficient was .82 (ranging from .68–.92), reflecting excellent agreement (Bartko, 1991; Fleiss, 1981).

Child Emotional Self-Regulation

Child emotional self-regulation was measured as persistence, frustration, and compliance. Child persistence and frustration were observed during two emotionally challenging tasks: one in which the experimenter repeatedly critiqued the child's drawing and one in which the child remained alone to open a locked box to obtain a toy inside but was given the wrong key. Compliance was measured via maternal report.

Procedures. The impossibly perfect circles task (IPC) was designed to elicit frustration and provide the opportunity to observe child persistence in response to adult negative feedback (Laboratory Temperament Assessment Battery [LabTAB]; Goldsmith & Rothbart, 1996). For 3.5 minutes, the experimenter repeatedly asked the child to draw a "perfect" circle and critiqued every circle for its imperfections. Critiques were specific, but did not include information on how to rectify the problem, for example, "That one is too flat." After the final circle was drawn, the experimenter deemed it a success, praised the child, and gave the child a certificate.

The transparent box task (TB) was designed to elicit frustration or anger and provided an opportunity to observe child persistence (LabTAB; Goldsmith & Rothbart, 1996). Children were able to see a desired toy through a transparent plastic box and were left alone to work on opening the box with a ring of wrong keys. After 3 min, the experimenter returned with the correct key and explained, "I guess I gave you the wrong keys. Let's try this one." The box was then opened; the child was encouraged to play for one minute with the toy.

Data coding and reduction for persistence and frustration. Persistence was rated in three ways: number of seconds spent participating in task (out of 210 s for IPC, 180 s for TB), number of seconds before interrupting task

(e.g., stops drawing circles, protests, asks to withdraw), and global rating of task engagement. Task engagement was rated on a 4-point scale, where 1 (*gives up totally, clear resignation*), 2 (*continues to work, but without interest, often averting gaze away from task*), 3 (*mixed behavior, keeps focused on task but periodically averts gaze*), 4 (*totally focused on task, expresses interest*). Within each task, indices of child persistence were correlated with one another (*r* range: .64–.77). A single persistence composite score was created by standardizing and averaging the three scores within each task then averaging this score across both tasks (*r* = .20 across tasks).

Frustration during both tasks was also coded on a 4-point scale, ranging from 1 (*no signs of frustration*) to 4 (*clear facial, verbal, and/or behavioral signs of frustration*). Frustration was standardized and averaged across both tasks (*r* = .22 across tasks) to create a single frustration score.

Interrater agreement. Two coders were trained to code persistence and frustration by using practice videotapes until they reached 75% agreement. Reliability was then calculated on the basis of 20% of the videotapes (23 tapes), randomly chosen. The average percent agreement was 95% (ranging from 88%–97%), and the average kappa coefficient was .89 (ranging from .84–.95), reflecting excellent agreement.

Maternal report of child compliance. The SSRS is a 49-item measure designed to assess social skills and problem behaviors in normal and clinical populations and yields a summary score for social skills and summary scores for each of four subscales: Cooperation, Assertion, Responsibility, and Self-Control. The Cooperation subscale (α = .81) was used as a measure of compliance because it reflects child compliance with adult rules. The Cooperation subscale is calculated as the summed frequency ratings (0 = *never*, 1 = *sometimes*, 2 = *very often*) of 10 *yes-no* questions such as *Helps with household tasks without being asked* and *Follows household rules*. The SSRS has demonstrated test–retest, interrater, and construct validity (Elliot, Gresham, Freeman, & McCloskey, 1988).

Results

Preliminary Analyses

Gender and age effects. Using two multivariate analyses of variance, the effects of gender, age, and their interaction were examined in relation to maternal and child variables separately. Multivariate effects were not significant. There was one significant univariate effect: Girls were reported to have greater inhibitory control ($M = 4.79$, $SD = .72$) than were boys ($M = 4.52$, $SD = .66$), $F(1, 112) = 4.45$, $p < .05$. Because of the paucity of group differences and that there were no hypotheses concerning age and gender difference, age and gender were excluded from subsequent analyses.

Child outcome variables. Means and standard deviations for measures of child emotional self-regulation are presented in Table 2. There were two significant correlations. As might be expected, persistence and frustration were negatively correlated ($r = -.50$, $p < .001$). In addition, the more persistent children were rated as less compliant by their mothers ($r = -.26$, $p < .01$).

Correlations among parenting variables. As seen in Table 3, there were numerous positive correlations among parenting variables both within and between the FP and the WT, with few distinct patterns emerging. This suggests that mothers evidenced diverse parenting strategies rather than relying on a limited parenting repertoire. For example, control during the FP was correlated with parenting within the FP (warmth, approach) and the WT (control, avoidance), whereas control during the WT was correlated with all other parenting behaviors during the WT. Of interest, there was modest stability between tasks for all parenting measures except approach. This suggests that contextual demands may be an important determinant of this aspect of parenting or may reflect the specific tasks chosen for the study (e.g., relatively few opportunities to focus on the positive during the WT due to the need to complete paperwork).

Analytic Plan

Associations were tested between predictors and the three measures of child emotional self-regulation (observed persistence and frustration, maternal report of compliance) in two stages. In the first stage, regression analyses were conducted with child and parenting variables by using the following steps: (a) child temperamental avoidance, (b) child temperamental approach, (c) child inhibitory control and soothability, (d) maternal warmth or control,

(e) maternal approach or avoidance, (f) the interaction between child approach and the first parenting variable, and (g) the interaction between child approach and the second parenting variable. For each regression, one of four pairs of parenting variables was entered in Steps 4 and 5 (warmth–approach FP, warmth–approach WT, control–avoidance FP, control–avoidance WT) for a total of four regressions for each dependent variable.

Four additional regressions were conducted, one for each dependent variable. These regressions were identical to previous ones but included only child variables by using the following six steps: (a) child temperamental avoidance, (b) child temperamental approach, (c) child inhibitory control, (d) child soothability (e) interaction between child approach and inhibitory control, and (f) interaction between child approach and soothability.

The goals of these regressions were to assess (a) general associations between parenting and child predictors of child emotional self-regulation; (b) the relative effect of theoretically similar parenting constructs (i.e., approach vs. warmth, avoidance vs. control); (c) task-specific parenting effects; and (d) interactions with child approach, that is, whether associations between independent and dependent variables depended on level of child approach. Therefore, the order of predictor variables reflected these theoretical and analytic goals: Child avoidance was entered first into the equations in order to account for this motivational dimension before exploring the effects of approach, child variables were entered first in order to assess the effects of parenting above and beyond child individual differences, and task-specific measures of parental control and warmth were entered before parental approach and avoidance in order to assess effects that were independent of those for control and warmth.

The second stage in these analyses was to explore the moderation effects (interactions): Patterns of effects for children relatively low versus high in approach. Given recommendations concerning probing interaction effects (Aiken & West, 1991; Finney, Mitchell, Cronkite, & Moos, 1984), if interaction terms' contributions to R^2 approached significance ($p < .10$), the interactions were plotted by using simple regression equations. These recast the significant interactions as the regression of one criterion on one predictor (Aiken & West, 1991). The criterion on the y-axis was plotted against three levels of the predictor, one standard deviation below the mean (low), 0 (mean value), and one standard deviation above the mean (high). Plotted regression lines represent two levels of child approach, low (1 SD below the $M = -.6725$) and high (1 SD

Table 3
Correlations Among Maternal Variables

Variable	1	2	3	4	5	6	7	8
1. Control FP	—	.36****	.29***	.17	.20**	.01	.09	.32****
2. Control WT		—	.01	.45****	-.05	.21**	.07	.52****
3. Warmth FP			—	.46****	.49****	.13	.05	.07
4. Warmth WT				—	.22*	.43****	.00	.39****
5. Approach FP					—	.04	.18	.21**
6. Approach WT						—	-.08	.16
7. Avoidance FP							—	.31****
8. Avoidance WT								—

Note. FP = free play; WT = waiting task.
** $p < .05$. *** $p < .01$. **** $p < .001$.

above the $M = .6725$). Analyses next tested whether the slopes of the lines significantly differed from each other (Aiken & West, 1991; Cohen & Cohen, 1983). For all steps of the analyses, predictor variables were centered to reduce problems of lack of invariance of regression coefficients and multicollinearity (Aiken & West, 1991).

Table 4 (child persistence), Table 5 (child frustration), and Table 6 (child compliance) present regression coefficients when all variables were entered and include only those regressions accounting for significant variance in the dependent variables.

Predictors of Child Persistence

Analyses with maternal approach/warmth FP. This regression equation as a whole accounted for 8% of the variance, but no single predictor accounted for significant variance.

Analyses with maternal approach/warmth WT. Step 6 was significant because of the interaction between child approach and maternal approach during the WT. The plot of associations between maternal approach during the WT and persistence is shown in Figure 1. As maternal approach increased, less approachful

Table 4
Regressions: Child and Parenting Predictors of Child Persistence

Step and predictor	<i>F</i>	<i>B</i>	β	<i>R</i> ²	ΔF
Parenting Predictors—Warmth/Approach WT					
Step 1					
Temperamental avoidance	1.41	0.11	0.14	0.02	2.10
Step 2					
Temperamental approach	<1	-0.02	-0.01	0.02	<1
Step 3					
Child inhibitory control	<1	0.07	0.07	0.03	<1
Child soothability	<1	0.06	0.07	0.03	<1
Step 4					
Maternal warmth WT	<1	-0.01	-0.07	0.03	<1
Step 5					
Maternal approach WT	<1	-0.01	-0.02	0.03	<1
Step 6					
Child Approach \times Maternal Warmth WT	-1.03	-0.03	-0.12	0.03	<1
Step 7					
Child Approach \times Maternal Approach WT	2.01**	0.09	0.23	0.08	4.03**
Parenting Predictors—Control/Avoidance WT					
Step 1					
Temperamental avoidance	1.29	0.10	0.12	0.02	2.10
Step 2					
Temperamental approach	<1	0.02	0.01	0.02	<1
Step 3					
Child inhibitory control	<1	0.08	0.08	0.03	<1
Child soothability	<1	0.01	0.01	0.03	<1
Step 4					
Maternal control WT	<1	-0.00	-0.01	0.05	2.25
Step 5					
Maternal avoidance WT	-2.38**	-0.05	-0.26	0.10	5.97**
Step 6					
Child Approach \times Maternal Control WT	1.03	0.01	0.11	0.10	<1
Step 7					
Child Approach \times Maternal Avoidance WT	<1	-0.02	-0.07	0.11	<1
Child Predictors—Inhibitory control, soothability					
Step 1					
Temperamental avoidance	1.30	0.10	0.13	0.02	2.10
Step 2					
Temperamental approach	<1	0.04	0.04	0.02	<1
Step 3					
Child inhibitory control	<1	0.03	0.03	0.02	<1
Step 4					
Child soothability	<1	0.06	0.06	0.03	<1
Step 5					
Child Approach \times Inhibitory Control	1.32	0.19	0.13	0.03	<1
Step 6					
Child Approach \times Soothability	-2.21**	-0.32	-0.23	0.08	4.87**

Note. The reported coefficient values are those generated when all steps are entered. WT = waiting task.
** $p < .05$.

Table 5
Regressions: Child and Parenting Predictors of Child Frustration

Step and predictor	<i>F</i>	<i>B</i>	β	<i>R</i> ²	ΔF
Parenting Predictors—Warmth/Approach WT					
Step 1: Temperamental avoidance	<1	−0.08	−0.09	0.01	1.09
Step 2: Temperamental approach	1.33	0.15	0.13	0.04	2.93*
Step 3: Child inhibitory control	<1	0.04	0.04	0.05	<1
Child soothability	−1.79	−0.21	−0.19	0.05	<1
Step 4: Maternal warmth WT	<1	−0.01	−0.03	0.05	<1
Step 5: Maternal approach WT	1.27	0.04	0.14	0.06	<1
Step 6: Child Approach × Maternal Warmth WT	<1	0.01	0.04	0.06	<1
Step 7: Child Approach × Maternal Approach WT	−1.86*	−0.10	−0.21	0.09	3.47**
Parenting Predictors—Control/Avoidance WT					
Step 1: Temperamental avoidance	<1	−0.07	−0.08	0.01	1.09
Step 2: Temperamental approach	1.43	0.16	0.14	0.04	2.93*
Step 3: Child inhibitory control	<1	−0.02	−0.02	0.05	<1
Child soothability	<1	−0.10	−0.09	0.05	<1
Step 4: Maternal control WT	<1	0.00	0.05	0.07	3.16*
Step 5: Maternal avoidance WT	1.97**	0.04	0.22	0.11	3.93**
Step 6: Child Approach × Maternal Control WT	<1	0.01	0.08	0.11	<1
Step 7: Child Approach × Maternal Avoidance WT	<1	−0.02	−0.05	0.11	<1

Note. The reported coefficient values are those generated when all steps are entered. WT = waiting task.
 * $p < .10$. ** $p < .05$.

children showed less persistence, whereas more approachful children showed greater persistence. The difference between the two slopes was significant, $t(111) = 2.26, p < .05$.

Analyses with maternal avoidance/control FP. This regression equation as a whole accounted for 6% of the variance, but no single predictor accounted for significant variance.

Analyses with maternal avoidance/control WT. Step 5 was significant because of the effect of maternal avoidance during the WT. As maternal avoidance increased, persistence decreased.

Analyses with child control capacities. Step 6 was significant because of the interaction between child approach and soothability. The plot of associations between soothability and persistence is shown in Figure 1. As soothability increased, less approachful children showed greater persistence, whereas more approachful children showed less persistence. The difference between the two slopes was significant, $t(111) = 2.29, p < .05$.

Predictors of Child Frustration

Analyses with maternal approach/warmth FP. This regression equation as a whole accounted for 6% of the variance, but no single predictor accounted for significant variance.

Analyses with maternal approach/warmth WT. Step 7 was significant because the interaction between child approach and maternal approach during the WT. The plot of associations between maternal approach during the WT and frustration is shown in Figure 2. As maternal approach increased, less approachful children showed greater frustration, whereas more approachful children showed little change. The difference between the two slopes was marginally significant, $t(111) = 1.35, p < .07$.

Analyses with maternal avoidance/control FP. This regression equation as a whole accounted for 6% of the variance, but no single predictor accounted for significant variance.

Analyses with maternal avoidance/control WT. Step 5 was significant because of the effect of maternal avoidance during the WT. As maternal avoidance increased, frustration increased.

Analyses with child control capacities. This regression equation as a whole accounted for 6% of the variance, but no single predictor accounted for significant variance.

Predictors of Child Compliance

Analyses with maternal approach/warmth FP. Step 1 was significant because of the effect of child avoidance: as child avoidance increased, child compliance decreased. Step 3 was significant because of the effect of child inhibitory control and soothability: As child inhibitory control and soothability increased, child compliance increased. Step 4 was significant because of the effects of maternal warmth: As maternal warmth increased, child compliance increased. Step 6 was significant because of the interaction between child approach and maternal warmth during the FP. The plot of associations between maternal warmth during the FP and compliance is shown in Figure 3. As maternal warmth increased, mothers reported that less approachful children showed greater compliance, whereas more approachful children showed little change. The difference between the two slopes was significant, $t(111) = 2.66, p < .01$.

Analyses with maternal approach/warmth WT. Steps 1 and 3 were still significant, but no parenting predictors accounted for significant variance. The regression as a whole accounted for 31% of the variance in child compliance.

Analyses with maternal avoidance/control FP. Steps 1 and 3 were still significant, but no parenting predictors accounted for significant variance. The regression as a whole accounted for 31% of the variance in child compliance.

Table 6
Regressions: Child and Parenting Predictors of Child Compliance

Step and predictor	<i>F</i>	<i>B</i>	β	<i>R</i> ²	ΔF
Parenting Predictors—Warmth/Approach FP					
Step 1					
Temperamental avoidance	−2.56**	−0.53	−0.21	0.06	7.58***
Step 2					
Temperamental approach	<1	−0.23	−0.07	0.07	<1
Step 3					
Child inhibitory control	3.71****	1.03	0.31	0.26	13.79****
Child soothability	2.95***	0.80	0.24	0.26	13.79****
Step 4					
Maternal warmth FP	4.00****	0.09	0.37	0.34	13.82****
Step 5					
Maternal approach FP	<1	−0.01	−0.01	0.34	<1
Step 6					
Child Approach × Maternal Warmth FP	−2.44**	−0.09	−0.25	0.40	9.13***
Step 7					
Child Approach × Maternal Approach FP	<1	−0.00	−0.00	0.40	<1
Child Predictors—Inhibitory control, soothability					
Step 1					
Temperamental avoidance	−2.18**	−0.46	−0.18	0.06	7.58***
Step 2					
Temperamental approach	<1	−0.07	−0.02	0.07	<1
Step 3					
Child inhibitory control	3.46****	0.96	0.29	0.19	16.22****
Step 4					
Child soothability	3.61****	1.01	0.31	0.26	10.03***
Step 5					
Child Approach × Inhibitory Control	−3.26****	−1.34	−0.28	0.31	7.83***
Step 6					
Child Approach × Soothability	1.87*	0.77	0.16	0.33	3.49**

Note. The reported coefficient values are those generated when all steps are entered. FP = free play.
 * $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.

Analyses with maternal avoidance/control WT. Steps 1 and 3 were still significant, but no parenting predictors accounted for significant variance. The regression as a whole accounted for 31% of the variance in child compliance.

Analyses with child control capacities. Child avoidance, inhibitory control, and soothability still accounted for significant variance in child compliance. Step 5 was significant because of the interaction between child approach and inhibitory control. Step 6 approached significance because of the interaction between child approach and soothability.

The plot of associations between inhibitory control and compliance is shown in Figure 3. As inhibitory control increased, mothers reported that less approachful children showed greater compliance, whereas more approachful children showed little change. The difference between the two slopes was significant, $t(111) = 2.44$, $p < .01$.

The plot of associations between soothability and compliance also is shown in Figure 3. As soothability increased, mothers reported that more approachful children showed greater compliance, whereas less approachful children showed little change or perhaps a slight increase in compliance. The difference between the two slopes was significant, $t(111) = 1.66$, $p < .05$.

Summary. Overall, maternal avoidance during the WT was associated with reduced persistence and greater frustration,

whereas maternal warmth during the FP was associated with greater compliance. As predicted, different predictors emerged for children varying in approach, and maternal approach and warmth showed context-sensitive links to child persistence, frustration, and compliance. As maternal approach during the WT increased, persistence increased for more approachful children, but persistence decreased and frustration increased for less approachful children. As maternal warmth during the FP increased, mothers reported increasing child compliance among less approachful children only. Finally, though child inhibitory control and soothability overall predicted greater maternal report of compliance, interaction effects emerged: the effect of inhibitory control on compliance was specific to low-approach children, and the effect of soothability was specific to high-approach children.

Discussion

This study attempts to address several open questions about predictors and moderators of emotional self-regulation in preschoolers. First, the study examines the role of child approach reactivity, a dimension of temperament that has been overshadowed by research on child avoidance. Second, the study examines two rarely measured aspects of parenting suggested by the adult motivation and self-regulation literatures, approach and avoidance

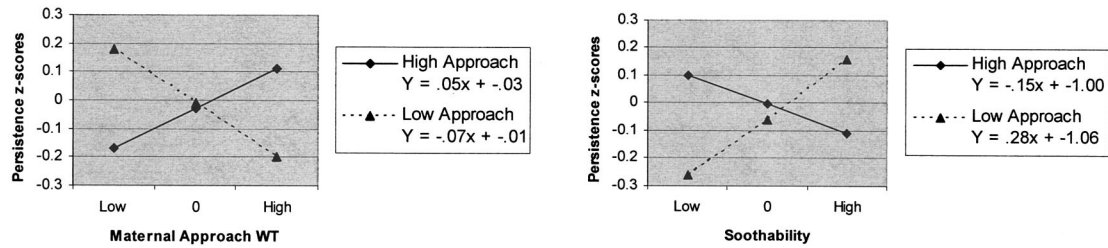


Figure 1. Simple regressions plotting persistence as a function of maternal approach during the waiting task (WT) and of child soothability. Lines refer to values for children showing low (1 SD below the mean) or high (1 SD above the mean) levels of approach reactivity.

(Higgins & Silberman, 1998). Third, the effects of parental approach and avoidance were compared with those of parenting dimensions more typically discussed in the developmental literature, warmth and control. Results suggested distinct links between each dimension of parenting and child emotional self-regulation. These links in part depended on child approach reactivity and task context. Links between child control capacities and emotional self-regulation also were evident, and were moderated by child approach reactivity. Overall, findings provided evidence for goodness-of-fit between child approach reactivity and multiple dimensions of parenting and for the interplay between approach reactivity and control capacities.

Several patterns emerged for this group of preschoolers as a whole. Consistent with predictions, maternal avoidance during the WT was associated with reduced persistence and greater frustration, consistent with the hypothesis that maternal focus on threats might amplify frustrations and decrease engagement during a challenging task. In contrast, maternal warmth during the FP was associated with greater maternal report of compliance, suggesting the role of mutually positive mother-child relationships in promoting child compliance. The task specificity of these effects also was consistent with hypotheses, with parenting during the WT being associated with emotional self-regulation during a challenging task, and parenting during the FP being associated with emotional self-regulation in a social context.

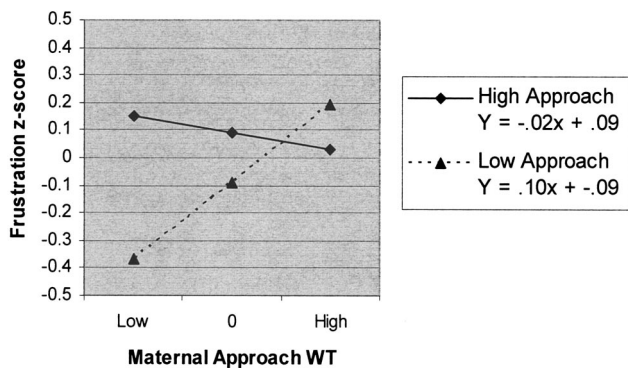


Figure 2. Simple regressions plotting frustration as a function of maternal approach during the waiting task (WT). Lines refer to values for children showing low (1 SD below the mean) or high (1 SD above the mean) levels of approach reactivity.

These associations suggest distinct socialization functions of avoidance and warmth but also raise a critical question: *Do these patterns reflect child and/or parent effects?* For example, parental avoidance, particularly during the WT, may signify parenting that orients children away from challenges. On the other hand, if a child has difficulty regulating, the parent may, as a result, help redirect the child away from emotional challenges. The notion of goodness-of-fit redirects this question by emphasizing patterns of interaction rather than causal links. For example, it is likely that child regulatory behaviors pull for specific aspects of parenting, which in turn amplify or reduce that child behavior. Effects for maternal warmth are consistent with this: Compliant children pull for greater maternal warmth, which in turn bolsters child compliance (Kochanska, 1997).

Results showing moderation effects provided the most compelling case for parenting goodness-of-fit. Distinct parenting predictors of emotional self-regulation emerged among children varying in approach, and context of parenting mattered. Mothers who were more approachful during the WT had children who were more persistent, but only if they were relatively high in approach. Less approachful children instead showed decreased persistence and increased frustration. This suggests goodness-of-fit between increasing maternal approach and relatively high child approach. In contrast, mothers who showed more warmth during the FP reported increasing child compliance, but only among less approachful children. These divergent patterns of effects for maternal approach and warmth argue for their independence.

Context effects were central to these results. The contexts of parenting placed unique demands on parents and children, and implications of parenting changed with context. Parenting during the WT was most closely linked to observed persistence and frustration during emotional challenges, whereas parenting during the FP was most closely linked to compliance, arguably a measure of emotional self-regulation in a social context. One interpretation of this is that interactions with mothers in each of these contexts reflect a context-dependent template for self-regulation. For example, parenting during the challenging WT might provide a working model for handling a challenge independently because mothers are largely unavailable during the task. Yet, an equally likely alternative explanation emphasizes child effects. A child's behavior pulls for certain parenting strategies within different contexts of interaction, and this reflects a child's general regulatory tendencies in such situations.

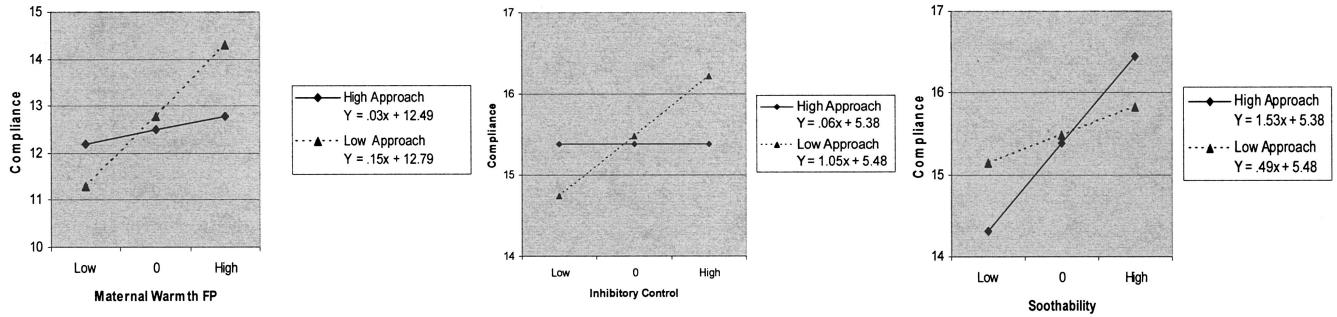


Figure 3. Simple regressions plotting maternal report of child compliance as a function of maternal warmth during the free play (FP), child inhibitory control, and child soothability. Lines refer to values for children showing low (1 SD below the mean) or high (1 SD above the mean) levels of approach reactivity.

Interactions between child temperament and control capacities illustrated the complex interplay of child factors affecting emotional self-regulation. Certain control capacities may facilitate effective self-regulation for some children, whereas for others, these same capacities may have little or detrimental impact. In this study, although inhibitory control and soothability overall predicted greater compliance, inhibitory control and soothability predicted different outcomes for children relatively low and high in approach. As soothability increased, less approachful children showed greater persistence, whereas more approachful children showed little change. As inhibitory control increased, less approachful children were reported to be more compliant, whereas as soothability increased, more approachful children were reported to be more compliant. These findings are consistent with hypotheses but are perhaps surprising given previous reports that inhibitory control predicts greater social competence for highly approachful children (Fox & Henderson, 2000). However, this might only hold true for children who are extremely approachful and for predicting general social competence, rather than compliance specifically. Moreover, observational measures of compliance are needed to remove the possible effect of maternal reporting bias. Future research also should focus much more on the interplay between reactivity and control. For example, more refined measurement of control capacities, including observed skills in addition to maternal report and an attempt to delineate a range of specific control capacities, should immensely strengthen future research.

Associations among other child variables also were of interest. For the sample as a whole, temperamental avoidance was associated with less compliance and temperamental approach was associated with greater frustration. This is consistent with research finding that threat and reward sensitivity are associated with regulatory vulnerabilities (Fox, 1994; Schmidt et al., 1999). In addition, more compliant children persisted less in both tasks. This is somewhat counterintuitive but makes sense in light of motivational factors and context characteristics. Compliance requires prosocial motivation and inhibitory control, among other skills. Persisting in the face of negative social feedback and independently working on an impossible task, on the other hand, may require quite different skills, including a “thicker skin” and stronger approach motives.

In summary, findings suggested that goodness-of-fit between parent and child is associated with regulatory strengths and vulnerabilities. Distinct pathways for the development of emotional

self-regulation emerged for children relatively low and high in approach. In addition, parenting and control capacities served different functions depending not only on child reward sensitivity but on context and aspect of self-regulation being predicted. This illustrates the principle of equifinality or multiple pathways in development (e.g., Kochanska, 1997; Kuczynski, Marshall, & Schell, 1998). This study was unique in its emphasis on child approach reactivity, a dimension of child temperament that remains poorly understood (Derryberry & Reed, 1994; Fowles, 1994; Putnam & Stifter, 2002), though it follows in the footsteps of a compelling literature on adult motivation (Carver et al., 2000), motivational pathways to attention-deficit/hyperactivity disorder (Nigg, Goldsmith, & Sachek, 2004) and the interplay between temperamental inhibition and exuberance (Fox et al., 2001). Because child avoidance has been much more extensively studied than has child approach, approachful exuberance has taken on the aura of being an antidote to avoidance-related vulnerabilities. However, findings from this study and others provide evidence for strengths as well as for vulnerabilities (e.g., frustration) associated with approach depending on how approach is regulated (Calkins & Fox, 2002; Fox, 1994; Nigg et al., 2004).

The current study contributes to the socialization literature by examining parental approach and avoidance and contrasting these dimensions with the better understood parenting dimensions of warmth and control. At first glance, parental approach-warmth and avoidance-control reflect conceptually similar aspects of parenting. Correlations among parenting variables and links between parenting and child emotional self-regulation, however, argue against this interpretation. Moreover, there is ample evidence from the adult motivation and self-regulation literatures that parental approach and avoidance, though novel constructs, are potentially excellent target parenting dimensions in studies of child self-regulation (Higgins & Silberman, 1998). Results supported their usefulness but also highlighted that mothers use a range of strategies and vary their socialization practices according to child needs in the moment. This fit between parenting and child needs might be the most powerful predictor of child outcomes (Grusec & Goodnow, 1994; Grusec et al., 2000; Smetana, 1995).

Yet, compared with maternal control and warmth, approach and avoidance parenting occurred less frequently. This calls into question the adequacy of an approach-avoidance conceptualization for parenting and suggests that these dimensions may not comprehen-

sively capture critical aspects of mother-child interactions. This interpretation is bolstered by the small effect sizes for child persistence and frustration. Yet, behavior in a specific situation is notoriously difficult to predict, and small effect sizes may still indicate a viable and meaningful predictor. Indeed, these small effect sizes may instead reflect a lack of inclusiveness in the coding scheme rather than the inadequacy of the parenting dimensions. For example, the coding of approach-avoidance in this study relied mainly upon mothers' verbal behavior. It could be expanded to include other aspects of parental focus on rewards and threats, such as maternal nonverbal behavior and emotion. Another strategy is to characterize the approach-avoidance quality of parenting using a more global scoring approach in order to capture these critical nonverbal aspects of interaction.

The lack of findings for maternal control also might reflect measurement issues. Maternal control is perhaps more typically measured in terms of harsh control and criticism, aspects of parenting that likely have a salient impact on child emotional self-regulation. In this study, maternal control was mainly measured as scaffolding: maternal guiding toward competence and reminders to maintain appropriate behavior and safety, with few occurrences of criticism or harsh control. Effects of maternal control on child emotional self-regulation may have been reduced because control was not extreme, because of the specific measures of emotional self-regulation, or because these specific tasks, FP and WT, did not pull for salient maternal control.

There were additional methodological challenges. First, as noted above, it is impossible to draw causal conclusions from these correlational data. Longitudinal studies and experimental manipulations are needed to tease apart causal effects. The concept of goodness-of-fit, however, does not require causal attributions and instead describes patterns of interaction in which parenting modulates child reactivity and is also primed by child reactivity. Both continually transact with the environment to predict outcomes (Belsky, 1984). The current study provides a useful description of dyadic patterns to guide future research. Second, there were sample limitations. Participants were almost exclusively normatively developing Caucasian children, reducing generalizability of findings to more diverse or clinical populations. Moreover, there was a somewhat restricted range of values for child emotional self-regulation, which might have compromised detection of significant differences. Third, complexities associated with measuring motivation abound. For example, approach parenting (e.g., talking about the desired prize) could be motivated by avoidance (fear of child failure). In future research, careful experimental manipulation of context and measurement of biological markers of reward and threat sensitivity, such as frontal electroencephalogram asymmetry (Davidson & Fox, 1989; Harmon-Jones, 2003), will be crucial to strengthening the inference of approach and avoidance. Fourth, because of inadequate sample size, this study did not compare children who showed high approach, high avoidance, or high reactivity in both dimensions. To examine the dynamic interplay between approach and avoidance, future research should assess child approach and avoidance simultaneously and use current findings in neuroscience to guide hypotheses (Davidson, 2000; Elliot & Thrash, 2002; Fowles, 1994).

This study was among the first to observe approach and avoidance characteristics of parenting and examine how their fit with child temperamental approach reactivity is associated with child

emotional self-regulation. The present work integrates motivation, a construct examined in terms of biological, cognitive, affective, and personality characteristics, with the study of socialization. This framework could greatly contribute to the understanding of emotional self-regulation because it sets the stage for interdisciplinary research that can meaningfully draw on both behavioral and neuroscientific tools (Davidson et al., 2002). Clearly, there is much to consider beyond approach and avoidance; distinct motives and individual differences and other aspects of parent-child interactions influence emotional self-regulation (Calkins & Fox, 2002; Derryberry & Rothbart, 1997; Kopp, 1982). Yet, this framework provides a unique perspective on the goodness-of-fit between parent and child and delineates developmental pathways consistent with neurobiological models of approach and avoidance (Gray & McNaughton, 2000; Panksepp, 1998). It thus has the potential to yield important insights into the development of emotional self-regulation.

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