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# Social Development

## Linking maternal warmth and responsiveness to children's self-regulation

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## Abstract

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6 The present study demonstrated that a more differentiated view of positive parenting practices  
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8 is necessary in the study of children's acquisition of self-regulation. Here, the unique  
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10 contributions of maternal warmth and responsiveness to distress to children's self-regulation  
11  
12 were tested in a sample of 102 German mothers and their kindergarten children (51 girls and  
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14 51 boys). Behavior regulation and internalization of rules of conduct were examined as  
15  
16 specific components of children's self-regulation. As expected, maternal warmth was  
17  
18 positively related to the child's behavior regulation. Responsiveness to distress was positively  
19  
20 linked to the child's internalization of rules of conduct. No significant interactions between  
21  
22 maternal parenting and either the child's gender or effortful control were found. The results  
23  
24 are discussed with regard to the unique functions that different parenting practices have for  
25  
26 children's self-regulation.  
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### Linking maternal warmth and responsiveness to children's self-regulation

Learning to effectively self-regulate one's own behavior in accordance with social standards is critical to children's development. In the literature, various parenting practices that promote this process have been identified (e.g., Chen, Lui, & Li, 2000; Friedlmeier & Trommsdorff, 1999; Jones et al., 2008). There is a growing body of empirical evidence that details the extent to which a specific parenting practice has a unique effect on a specific developmental outcome (see e.g., Davidov & Grusec, 2006; Jones et al., 2008; Mize & Pettit, 1997). However, studies reporting functionally different effects involving positive parenting practices in non-American samples are scarce. Moreover, it has been pointed out that considerable differences exist between the US and European cultures, for instance, regarding parents' naïve theories of child development and socialization goals (Harkness, Super, & van Tiejn, 2000; Keller et al., 2006). Therefore, the purpose of the present study was to clarify the association of two aspects of positive parenting with two types of children's self-regulation in a German sample of kindergarten children. Positive parenting includes behaviors such as support, nurturance, and warm and appropriate discipline which promote a positive parent-child relationship (e.g., Tildesley & Andrews, 2008). Specifically, we investigated maternal warmth and responsiveness to distress in relation to children's behavior regulation in a delay task and children's internalization of rules of conduct. Moreover, the effects of children's gender and temperament on the relations between positive parenting and children's self-regulation were investigated as previous research has shown that children's characteristics moderate relations between parenting and developmental outcomes (e.g., Bates, Pettit, Dodge, & Ridge, 1998; Eisenberg et al., 2001). So far however, most of these studies have focused on the development of externalizing problem behavior.

#### *Self-Regulation*

Self-regulation is a broad concept that focuses on an individual's motivation and ability to modify his or her emotion and behavior to achieve goals (Kopp, 1982; McClelland et al.,

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2  
3 2007; Trommsdorff, 2009a). As a superordinate construct, self-regulation includes narrower  
4 constructs, such as the regulation of behavior (e.g., Kopp & Wyr, 1994) and the  
5  
6 internalization of rules of conduct (e.g., Kochanska, DeVet, Goldman, Murray, & Putnam,  
7  
8 1994). Behavior regulation is defined as the ability to express or control one's impulses,  
9  
10 motor responses, and other behavior (Wong et al., 2006). Behavior regulation in children  
11  
12 progressively shifts from external to internal processes (Kopp, 1982; McClelland, Ponitz,  
13  
14 Messersmith, & Tominey, in press). During development children become increasingly aware  
15  
16 of social standards. They learn to take a more active role in the self-regulation process and to  
17  
18 regulate their behavior more independently of parental monitoring and intervention  
19  
20  
21 (Kochanska & Aksan, 2006). Internalization involves adopting rules and norms, so that acting  
22  
23 according to social standards is motivated not only by external consequences but increasingly  
24  
25 by internalized rules (Grusec & Goodnow, 1994). The development of behavior regulation  
26  
27 proceeds on an observable level of concrete behaviors, whereas internalization implies the  
28  
29 acquisition of conscience.  
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### 35 36 *Socialization of Self-Regulation* 37

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39 Psychologists have identified children's self-regulation as an important socialization  
40  
41 goal of parents (e.g., Grusec, Goodnow, & Kuczynski, 2000; Maccoby & Martin, 1983).  
42  
43 Typically, such socialization efforts begin in early childhood, when children become  
44  
45 increasingly aware of the expectations of their social environment through parental rule-  
46  
47 setting. For almost 30 years, research on parenting with regard to child outcomes was  
48  
49 dominated by Baumrind's (1971) classification of parenting styles. A parenting style refers to  
50  
51 a constellation of attitudes toward a child that is fairly constant over time and in a variety of  
52  
53 contexts (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Darling & Steinberg,  
54  
55 1993; Maccoby & Martin, 1983). However, Darling and Steinberg (1993) argue that for an  
56  
57 understanding of the processes through which parenting influences child outcomes, one needs  
58  
59 to differentiate between parenting style (e.g., authoritative or authoritarian) and parenting  
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1  
2  
3 practices (e.g., warmth, responsiveness, control). Individual parenting practices that often  
4  
5 have been grouped together for research purposes can serve different functions for children's  
6  
7 developmental outcomes (Maccoby, 2000; Porter et al., 2005). Specific parenting practices  
8  
9 are used by parents to help children achieve particular socialization goals (Darling &  
10  
11 Steinberg, 1993; Mize & Pettit, 1997). They operate in circumscribed socialization domains,  
12  
13 such as self-regulation, directly affect child behaviors (e.g., the ability to resist temptations),  
14  
15 and have an impact on parent's socialization efforts (Mize & Pettit, 1997). According to the  
16  
17 specific developmental outcome in question, different parenting practices need to be  
18  
19 investigated (Darling & Steinberg, 1993; Grusec & Davidov, 2007). Stewart and Bond (2002)  
20  
21 stated, "Instead of describing parenting characteristics by using typologies, an alternative  
22  
23 approach is to dismantle typologies into their component parts" (p. 381; cf. also Darling &  
24  
25 Steinberg, 1993). Nonetheless, many studies take a global approach to positive parenting, in  
26  
27 which different positive parenting practices are grouped together (Goldberg, Grusec, &  
28  
29 Jenkins, 1999; Porter et al., 2005). In particular, two aspects of positive parenting, warmth  
30  
31 and responsiveness to distress, have often been treated as one, because their characteristics  
32  
33 and their functions for child development seem to be very similar. Research, however,  
34  
35 demonstrated a wide variability in warm and responsive parenting (e.g., Cahill, Deater-  
36  
37 Deckard, Pike, & Hughes, 2007). MacDonald (1992) suggested that warmth and  
38  
39 responsiveness to distress are not generally associated (such as that the level of warmth  
40  
41 influences the effects of responsiveness and vice versa). Mize and Pettit (1997) found support  
42  
43 for functionally different effects of these different aspects of parenting: responsive parenting  
44  
45 (i.e., warmth, synchrony) accounted for unique variance in teacher ratings of children's social  
46  
47 skills and aggression. Recently, a study by Davidov and Grusec (2006) has provided further  
48  
49 evidence that warmth and responsiveness to distress are two distinct features of positive  
50  
51 parenting. These features require different skills and resources from parents. Moreover, they  
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53 serve different functions in children's development. Parental warmth is characterized by high  
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3 degrees of affection, spontaneous expressions of positive emotions in parent-child interactions,  
4  
5 and frequent praise of the child, as expressed by behaviors such as kissing and hugging the  
6  
7 child (Davidov & Grusec, 2006; MacDonald, 1992). As distinguished from warmth,  
8  
9 responsiveness to distress focuses on parental reactions when a child is upset. Positive  
10  
11 parental responsiveness to distress involves supportive reactions: for example, comforting or  
12  
13 helping the child when he or she is facing an upsetting situation (Davidov & Grusec, 2006).  
14  
15

16  
17 *Warmth and children's behavior regulation.* By frequently engaging their children in  
18  
19 interactions involving positive emotions, love, and praise of the child, parents facilitate  
20  
21 children's ability and motivation for behavior regulation. For instance, a parent consistently  
22  
23 expressing love and affection induces positive mood in the child. The child in turn is willing  
24  
25 to control impulses and behaviors in order to continue the positive and satisfying parent-child  
26  
27 interactions (Grusec & Davidov, 2007). Thus, parental warmth might be particularly related  
28  
29 to children's development of behavior regulation. Studies have consistently demonstrated  
30  
31 positive links between parental warmth and children's behavior regulation as assessed by  
32  
33 parents' reports (e.g., Colman, Hardy, Albert, Raffaelli, & Crockett, 2006). In a recent study  
34  
35 by Jennings et al. (2008), a positive relation between maternal warmth and behavior  
36  
37 regulation in toddlers was observed. Other studies (e.g., Eisenberg et al., 2005; Jones et al.,  
38  
39 2008; Russell & Russell, 1996) have shown that parental warmth was related to low levels of  
40  
41 externalizing problems in children, and that high levels of behavior regulation were likewise  
42  
43 associated with the absence of externalizing problems in childhood and adolescence (Wong et  
44  
45 al., 2006). Thus, parental warmth is expected to be positively related to behavior regulation. .  
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53 *Responsiveness to distress and children's internalization of rules of conduct.* The  
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55 process of internalization is accompanied by children's experience of and coping with  
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57 negative emotions, for instance, when being scolded for some mischief. Parents' active  
58  
59 strategies affect how a child copes with these experiences. Responsive strategies help a child  
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to acquire and to internalize social rules and standards (e.g., Kochanska & Thompson, 1997)

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3 thus enhancing a child's motivation and ability to comply with parental demands and to  
4  
5 internalize rules of conduct (Karreman, van Tuijl, van Aken, & Dekovic, 2006; Kochanska &  
6  
7 Murray, 2000). According to Maccoby and Martin (1983), responsive parenting practices  
8  
9 facilitate children's understanding of principles of cause and effect. These practices influence  
10  
11 how open children are to parental socialization efforts and how willingly they learn to make  
12  
13 appropriate choices (Grusec & Goodnow, 1994). Parental responsiveness thus facilitates  
14  
15 children's motivation to meet situational demands. Further evidence is provided by a study  
16  
17 examining the role of early versus ongoing maternal responsiveness in predicting cognitive  
18  
19 and social development in full-term and preterm children (Landry, Smith, Swank, Assel, &  
20  
21 Vellet, 2001). The results of this study showed that children's internalization is fostered when  
22  
23 parents demonstrate consistent patterns of responsiveness to their children's emotional needs  
24  
25 throughout infancy and early childhood. Correspondingly, we expected that responsiveness to  
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27 distress is positively related to internalization of rules of conduct.  
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### 33 *Child's Gender and Effortful Control*

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36 Previous studies (e.g., Bates et al., 1998; Blair et al., 2008; [Davidov & Grusec, 2006](#);  
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38 Eisenberg, Hofer, & Vaughan, 2007; ~~[Davidov & Grusec, 2006](#)~~, Kochanska et al., 1994) have  
39  
40 shown that gender and effortful control are relevant in the development of children's self-  
41  
42 regulation. Several studies revealed gender differences in children's and adolescents' self-  
43  
44 regulation: Overall, girls have, compared to boys, stronger self-regulation skills (Duckworth  
45  
46 & Seligman, 2006; Matthews, Ponitz, & Morrison, 2009; Raffaelli, Crockett, & Shen, 2005).  
47  
48 However, these findings appear to be unique ~~in-to~~ North-American samples and may not  
49  
50 apply to other cultures, especially when observational measures of self-regulation are used  
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52 (McClelland et al., in press). Some studies investigating gender as a moderating link between  
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54 parenting and self-regulation revealed mixed and inconsistent findings (e.g., Colman et al.,  
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56 2006; Davidov & Grusec, 2006). Davidov and Grusec (2006) found that the child's gender,  
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58 for instance, moderated the relationship between maternal responsiveness to distress and  
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3 emotion regulation. The associations were obtained only for boys but not for girls. In contrast,  
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5 in a study by Colman et al. (2006) child gender did not moderate the effects of parenting on  
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7 later self-regulation.  
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10 Generally, effortful control has been defined as the competence to inhibit a dominant  
11 response and/or to activate a subdominant response (Rothbart & Bates, 2006). Children's  
12 individual differences in effortful control may lead to different reactions to parenting. As a  
13  
14 result, a child is more or less susceptible to parent behaviors (Belsky, 2005). Additionally,  
15  
16 child protective factors such as effortful control may buffer the consequence of negative  
17  
18 parenting (Bates & Pettit, 2007; Rothbart & Bates, 2006). Consistent with this view, effortful  
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20 control has previously been identified as a moderator of the relation between parenting and  
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22 children's self-regulation (e.g., Lengua, 2008; Xu, Farver, & Zhang, 2009). A high level of  
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24 effortful control in children, for example, reduced the risk of externalizing problems in a  
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26 family context of corporal punishment (Lengua, 2008).  
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### 33 *Study Aim*

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36 Although, there is a growing body of evidence for incremental effects of different  
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38 parenting dimensions in the prediction of different child outcomes (e.g., Davidov & Grusec,  
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40 2006; Mize & Pettit, 1997; Pettit, Laird, Dodge, Bates, & Criss, 2001; Reitz, Dekovic, &  
41  
42 Meijer, 2006) the specific functions of different parenting practices for children's self-  
43  
44 regulation need to be untangled in more detail, especially in non-American samples. In the  
45  
46 present study, we expected that maternal warmth and responsiveness to distress would  
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48 uniquely contribute to various self-regulation skills in kindergarten children. Maternal warmth  
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50 was hypothesized to be positively related to the child's behavior regulation. Furthermore, we  
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52 expected that maternal responsiveness to distress would correlate positively with the child's  
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54 internalization of rules of conduct. In addition, we expected that the children's gender and  
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56 effortful control would interact with parenting behavior (i.e., maternal warmth and  
57  
58 responsiveness to distress) in predicting self-regulation skills: Stronger associations were  
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3 expected for girls compared to boys and for children with higher levels of effortful control in  
4 comparison to children with lower effortful control. Mother's level of education served as a  
5 control variable as research has found links between family demographic variables (i.e.,  
6 parental education) and the factors of interest in the current study (e.g., Connell & Prinz,  
7 2002; Evans & Rosenbaum, 2008; Howse, Lange, Farran, & Boyles, 2003).

## 15 Method

### 17 *Participants*

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20 Participants consisted of 102 mother-child dyads (50 percent girls; 4-years 5 months to  
21 6-years 5-months,  $M = 66$  months). The mothers reported no evidence of any general medical  
22 disorder; for six children, a delay in language development was reported. The families were  
23 recruited from public kindergartens. The recruitment procedure included an information letter  
24 about the study that was distributed through kindergartens in ~~Constance~~Konstanz, a town in  
25 the south of Germany. Approximately, 700 mothers received a letter. Mothers ( $n = 149$ ) who  
26 agreed to participate were contacted by phone; 117 mother-child dyads finally attended the  
27 study. Fifteen participants had missing data, yielding the final sample size of 102 dyads.  
28 Participants were primarily of middle-class socioeconomic status. All families came from a  
29 European cultural background. The majority of children lived in a two-parent household  
30 (80%). Twenty-six children (25%) were living in one-child-families, 61 (60%) had one  
31 sibling, and 15 (15%) had two or more siblings. All mothers had at least 12 years of schooling.  
32 Using ICSED-97 (Organization for Economic Co-operation and Development, 1999) to  
33 indicate mother's level of education, 69 mothers (68%) in the sample had completed the first  
34 stage of tertiary education (i.e., BA or MA). Sixty-two mothers (61%) were currently  
35 employed, half of these working full-time.

### 57 *Procedures*

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59 The mothers and children visited the laboratory of the Developmental and Cross-  
60 Cultural Psychology research group at the University of Konstanz twice within one week.

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3 During the first session, a delay task (explained in greater detail below) was conducted by a  
4 trained female graduate student in Psychology. In a separate room, the mothers individually  
5 completed questionnaires on parenting practices, children's internalization of rules of conduct,  
6 and temperament. During the second session, the mothers answered an additional  
7 questionnaire on parenting practices. At the end of each session, the mothers and children  
8 received small presents. All mothers signed an informed letter of consent before participating  
9 in the study.

### 19 *Measures*

22 Measures that had not been previously used for German samples were translated by two  
23 German speakers fluent in both German and English. Divergent translations were checked  
24 and corrected.

29 *Maternal warmth.* The *Child-Rearing Practices Report Q-Sort* (CRPR Q-Sort; Block,  
30 1965, modified by Roberts, 1989, 1999) measures parents' attitudes, behaviors and feelings  
31 about their children using 99 item-cards, each with statements such as, "*I express affection by*  
32 *hugging, kissing and holding my child.*" and "*My child and I have warm, intimate times*  
33 *together.*" Mothers were asked to evaluate their parenting behavior by sorting the cards into 9  
34 piles, each containing 11 cards, according to the degree to which the items were descriptive of  
35 their parenting behavior (ranging from 1, "These cards are most un-descriptive", to 9, "These  
36 cards are most descriptive"). The CRPR Q-Sort items that asked directly about maternal  
37 responsiveness to distress ( $n = 9$ ) were deleted prior to analyses in order to avoid interference  
38 between the two variables. A criterion sort of warmth was used on the basis of independent  
39 ratings from six experts (see Roberts, 1989). Correlations between mothers' individual ratings  
40 and this criterion sort were computed. The correlation coefficient can range from -1.00 (low  
41 warmth) to 1.00 (high warmth).

59 *Maternal responsiveness to distress.* The *Coping with Children's Negative Emotion*  
60 *Scale* (CCNES; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002) is a self-report

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3 instrument consisting of six subscales that represent different parental responses to children's  
4  
5 negative emotions. The questionnaire includes 12 hypothetical situations of common  
6  
7 emotionally evocative events that young children often experience (for example, a bicycle  
8  
9 accident or being rejected by a friend). The mothers answered questions about each situation  
10  
11 on a 7-point scale (from 1, "very unlikely", to 7, "very likely"), indicating the probability that  
12  
13 they would respond to the situation in the explained manner. Each question represents a  
14  
15 typical response pattern for one of the six subscales: emotion-focused reactions, problem-  
16  
17 focused reactions, expressive encouragement, distress reactions, punitive reactions, and  
18  
19 minimization reactions. Studies have shown that the CCNES is a valid and reliable instrument  
20  
21 to assess parental responsiveness to children's distress (Fabes et al., 2002; Gentzler,  
22  
23 Contreras-Grau, Kerns, & Weimer, 2005). In the present study, Cronbach's  $\alpha$  Alphas ranging  
24  
25 from .70 to .86 for the six subscales were found. These are consistent with the results of other  
26  
27 studies (Coutu, Dubeau, Provost, Royer, & Lavigueur, 2002; Davidov & Grusec, 2006).  
28  
29 Following Davidov and Grusec (2006), a total score for responsiveness to distress was  
30  
31 derived by averaging the six subscales (reversing the distress reactions, punitive reactions,  
32  
33 and minimization reactions subscales).  
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41 *Assessment of behavior regulation.* The behavior regulation of the children was  
42  
43 observed using the Snack Delay task of the *Laboratory Temperament Assessment Battery –*  
44  
45 *Preschool Version* (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1993). The  
46  
47 procedure was videotaped. The children were offered candy under the constraint that they  
48  
49 were to wait with their hands in their laps until a bell rang before eating the candy. The  
50  
51 procedure was introduced with a practice trial. Six trials followed with different pause lengths,  
52  
53 varying between 0 and 30 seconds (5s, 10s, no pause, 20s, no pause, and 30s). To judge  
54  
55 whether the child violated the given rule before the experimenter rang the bell (i.e., by  
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57 reaching for the candy), two previously trained raters coded the video for each trial (with 0 =  
58  
59 no and 1 = yes). Overall possible scores ranged from zero to six. For analyses, the variable  
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3 was recoded, with zero corresponding to low behavior regulation and six to a high level of  
4  
5 behavior regulation. Inter-rater reliability, computed for 30% of the cases, was good ( $\kappa = .87$ ).

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8 *Assessment of internalization of rules of conduct.* The *Maternal Reports of Conscience*  
9  
10 *Development* (MRCD; Kochanska et al., 1994) was used as a parent-report instrument to  
11  
12 measure each child's internalization of rules of conduct. The original instrument consists of  
13  
14 100 items. The response format is a 7-point scale ranging from 1 ("extremely untrue, not at all  
15  
16 characteristic") to 7 ("extremely true, very characteristic"). The MRCD was used in an  
17  
18 abridged version, because the questionnaires for this study were administered as part of a  
19  
20 larger set of questionnaires relevant to other research questions. The items ( $n = 43$ ) forming  
21  
22 the factor "active moral regulation" were given to the mothers as a questionnaire according to  
23  
24 the original sequence of items. This factor consists of four scales: confession (e.g., "*My child*  
25  
26 *will spontaneously admit fault or wrongdoing, either verbally or nonverbally.*"), reparation  
27  
28 (e.g., "*My child seems relieved when given an opportunity to repair a damage s/he has*  
29  
30 *caused.*"), concern about others' transgressions (e.g., "*My child gets upset when a guest*  
31  
32 *breaks a household rule.*"), and internalized conduct (e.g., "*My child clearly hesitates before*  
33  
34 *doing something forbidden, even when alone.*"). The observed Cronbach's  $\alpha$ s, ranging  
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36 from .74 to .87, were comparable to those of an American sample reported by Kochanska et al.  
37  
38 (1994). The scales were averaged to form a single active moral regulation score (Cronbach's  
39  
40  $\alpha = .76$ ).

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48 *Assessment of effortful control.* The *Children's Behavior Questionnaire* (CBQ; Rothbart,  
49  
50 Ahadi, Hershey, & Fischer, 2001) was used to measure each child's level of effortful control.  
51  
52 Mothers completed the CBQ short form, consisting of 94 items. In this parent-report measure,  
53  
54 the mother indicates whether a statement about her child is true on a 7-point scale (from 1,  
55  
56 „extremely untrue of your child”, to 7, “extremely true of your child”). The instrument  
57  
58 includes 15 scales that can be aggregated to three temperamental dimensions: *effortful control*,  
59  
60 *negative affectivity*, and *surgency*. For our study, we adopted the factor solution of Rothbart et

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2  
3 al. (2001) to derive the factor for effortful control. As in Kochanska et al. (1994), all items  
4  
5 were checked for any face resemblance to items relevant to internalization of rules, in order to  
6  
7 avoid interference between these variables. Three items were consequently deleted. The scales  
8  
9 “inhibitory control” (“*My child approaches sites, it has been told, that they are dangerous,*  
10  
11 *slowly and carefully.*”), “attentional focusing” (“*When drawing or coloring in a book, my*  
12  
13 *child shows strong concentration.*”), “low intensity pleasure” (“*My child enjoys gentle*  
14  
15 *rhythmic activities, such as rocking or swaying.*”), and “perceptual sensitivity” (“*My child*  
16  
17 *seems to listen to even quiet sounds.*”) were averaged. The resulting Cronbach's  $\alpha$  (.60)  
18  
19 was lower than the Cronbach's  $\alpha$  (.74) reported by Putnam and Rothbart (2006) for the  
20  
21 very short form. The deletion of items did not alter reliability.  
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## 27 Results

### 28 Preliminary Analyses

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31 The obtained correlation coefficients for maternal warmth were transformed using  
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33 Fisher's  $r$  to  $z$  procedure to enable their use in data analysis (a common procedure when using  
34  
35 Q-sort measures; e.g., [Roberts, 1999](#); Cassibba, Van IJzendoorn, & D'Odorico, 2000; [Roberts,](#)  
36  
37 [1999](#)). This was done to adjust the distribution by converting Pearson's  $r$  to the normally  
38  
39 distributed variable  $z$ . Maternal warmth was relatively high in the sample. The scores for  
40  
41 maternal responsiveness to distress were comparable to the means reported by Davidov and  
42  
43 Grusec (2006): mothers perceived themselves to be highly responsive when confronted with  
44  
45 their children's distress. Mothers also reported high scores for their children's internalization  
46  
47 of rules of conduct and effortful control. The means were comparable to those reported in  
48  
49 other studies (e.g., Kochanska et al, 1994; Komsis et al., 2006). The children's observed  
50  
51 behavior regulation ranged from low (“0”) to high (“6”). Table 1 shows means and standard  
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53 deviations of all variables.  
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61  $T$ -tests of two independent groups revealed a significant effect of the child's gender  
62 only on his or her internalization of rules of conduct,  $t(100) = -2.12, p < .05, \eta^2 = .04$ .

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2  
3 Mothers reported a higher level of internalization of rules of conduct for girls ( $M = 4.82$ ,  $SD =$   
4  $0.56$ ) than for boys ( $M = 4.52$ ,  $SD = 0.82$ ). Pearson correlations yielded no significant  
5  
6 relations between the age of the child, the level of effortful control, and any predictor or  
7  
8 outcome variable, respectively. However, mother's level of education was significantly and  
9  
10 positively related to her warmth. Therefore, mother's level of education was entered in further  
11  
12 hypotheses testing. The correlations are presented in Table 2.  
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### 17 *Overview of Analyses*

18  
19 The hypotheses were tested with hierarchical regression analyses. Behavior regulation  
20 and the internalization of rules of conduct served as dependent (outcome) variables. The first  
21  
22 block included mother's level of education and the child's gender (or effortful control,  
23  
24 respectively). The second block included maternal parenting variables. Because maternal  
25  
26 warmth and responsiveness to distress were positively and significantly correlated (see also  
27  
28 Davidov & Grusec, 2006), we entered both variables together in the second block to test the  
29  
30 unique effects of maternal warmth and responsiveness to distress on the child outcome  
31  
32 variables. Furthermore, we also tested whether maternal warmth and responsiveness to  
33  
34 distress interacted with the child's gender or effortful control to predict any of the child's  
35  
36 outcome variables, respectively. The interaction terms were entered in a separate third block.  
37  
38 The variables were centered before the interaction terms were computed (Cohen, Cohen, West,  
39  
40 & Aiken, 2003).  
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### 48 *Predicting Children's Behavior Regulation*

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50 First, we examined relations between parenting and children's behavior regulation.  
51  
52 Consistent with our hypothesis, maternal warmth was a significant predictor of higher levels  
53  
54 of behavior regulation, independent of any contribution of maternal responsiveness to distress.  
55  
56 Neither of the child variables (gender and effortful control) nor the mother's level of  
57  
58 education reached significance in predicting the child's behavior regulation. There were no  
59  
60 significant interactions between the child's gender (effortful control, respectively) and the

parenting variables, although the interaction between the child's effortful control and maternal responsiveness to distress approached significance ( $p = .06$ ). The results are presented in Tables 3 and 4.

### *Predicting Children's Internalization of Rules of Conduct*

The prediction of children's internalization of rules of conduct was considered next. Analyses yielded significant main effects for the child's gender and mother's responsiveness to distress. Girls showed a higher level of internalization than boys. Consistent with our hypothesis, maternal responsiveness and children's internalization of rules of conduct were significantly and positively associated, whereas maternal warmth was not a significant predictor. Again, there was no significant effect of mother's level of education. There were no significant interaction between the child's gender and responsiveness to distress, however the  $g$ Gender  $x$   $m$ Maternal  $w$ Warmth interaction was marginally significant ( $p = .08$ ). A summary of results is presented in Table 5.

Table 6 shows the results of the regression analysis involving the child's effortful control as predictor. Mother's responsiveness to distress was again predictive of the child's level of internalization. The analysis yielded no main effects for mother's level of education, maternal warmth, and the child's effortful control. Again, no significant interaction between the child's effortful control and responsiveness to distress was found. For maternal warmth, there was a significant interaction with the child's effortful control. Please note, however, that contrary to the previously presented results, the full regression equation of this analysis did not reach significance.

In summary, consistent with our hypotheses, maternal warmth significantly predicted behavior regulation, over and above the influence of maternal responsiveness to distress. In contrast, the child's gender and effortful control were not significant predictors or moderators in the prediction of behavior regulation. As expected, maternal responsiveness to distress significantly and positively predicted the child's internalization of rules of conduct when



1  
2  
3 controlling for maternal warmth. The child's gender was also a significant predictor: girls  
4  
5 showed higher levels of internalization than boys as reported by mothers. There were no  
6  
7 significant interaction effects in the prediction of internalization. Mother's level of education  
8  
9 did not reach significance, neither in the prediction of the child's behavior regulation nor in  
10  
11 the prediction of internalization.  
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#### 14 Discussion

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17 The purpose of the present study was to specify the function of distinct positive  
18  
19 parenting practices – maternal warmth and responsiveness to distress – in children's self-  
20  
21 regulation (behavior regulation and internalization of rules of conduct) and to extend  
22  
23 previous findings (e.g., Davidov & Grusec, 2006) to a different population (i.e., a non-  
24  
25 American sample). The results were consistent with our expectations, and confirmed the  
26  
27 necessity of a separate examination of maternal warmth and responsiveness to distress in  
28  
29 regard to child outcomes (Davidov & Grusec, 2006). In line with previous findings (e.g.,  
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31 Colman et al., 2006; Jennings et al., 2008; Karreman et al., 2006), maternal warmth was  
32  
33 positively related to children's behavior regulation, whereas responsiveness to distress was  
34  
35 positively associated with children's internalization of rules of conduct. Both parenting  
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37 practices exerted their specific effects on child outcomes independently.  
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44 The present study extends previous work (e.g., Darling & Steinberg, 1993; Davidov &  
45  
46 Grusec, 2006; Mize & Pettit, 1997) on functionally different effects of different parenting  
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48 dimensions. Davidov and Grusec (2006) found evidence in favour of positive links between  
49  
50 maternal warmth, children's emotion regulation, and peer group acceptance. Our study  
51  
52 demonstrated that maternal warmth is also important for children's behavior regulation. In  
53  
54 early childhood, behavior regulation begins to develop within child-caregiver interaction  
55  
56 (McClelland et al., in press). Warm and supportive parenting, including positive emotional  
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58 expressions (e.g., hugging), provides the emotional climate for the development of behavior  
59  
60 regulation. Maternal warmth fosters a child's willingness to control his or her impulses and

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3 behaviors according to given rules, in order to continue the positive parent-child-interactions  
4  
5 (Jennings et al., 2008). Part of the explanation is that maternal warmth promotes a child's  
6  
7 enjoyment of interactions with the mother (Kochanska, Aksan, Prisco, & Adams, 2008).  
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10  
11 Furthermore, the results illustrate that mother's responsiveness to distress specifically  
12  
13 enhances children's motivation and ability to internalize rules of conduct. Internalization  
14  
15 implies refraining from prohibited actions even when not under surveillance (Grusec &  
16  
17 Goodnow, 1994; Kochanska et al., 1994). A child caught in misbehavior may experience  
18  
19 negative emotions, for example when she or he is scolded by the parent. The parent's  
20  
21 responsive reactions to the expression of negative emotions, even though the parent is  
22  
23 currently upset about the child's misbehavior, facilitate the child's emotion regulation  
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25 (Bugental, 2000; Roberts & Strayer, 1987). These links, however, may also be of more  
26  
27 indirect nature. Since maternal responsiveness to distress is positively associated with a  
28  
29 child's emotion regulation (Davidov & Grusec, 2006), a child of a responsive mother is more  
30  
31 motivated and better able to regulate his or her emotion during discipline situations and, thus,  
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33 is more attentive to parental messages (Grusec & Davidov, 2007).  
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39 Contrary to our expectations, we found no significant interaction effects of parenting  
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41 variables and the child's gender or effortful control in the prediction of behavior regulation or  
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43 in the prediction of internalization of rules of conduct. In contrast, other studies reported clear  
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45 gender differences. For example, Russell and Russell (1996) reported significant relation  
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47 between warmth and rates of misbehavior in girls but not in boys whereas Davidov and  
48  
49 Grusec (2006) reported a significant positive association between maternal warmth and child  
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51 peer acceptance in boys only. This pattern of results suggests that the mother's parenting  
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53 practices impact boys' and girls' development differently (Colman et al., 2006). However,  
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55 recently it has been suggested that gender differences may be unique to North American  
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57 samples and to parent- or teacher-rated measures. No significant gender differences were  
58  
59 found, for example, in Taiwanese, South Korean, and Chinese samples when using a direct  
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2  
3 measure of behavior regulation (McClelland et al., in press). This possibility is consistent with  
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5 our findings as we found gender differences only regarding parents' reports (mothers reported  
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7 higher levels of internalization for girls than for boys) but not in the direct measure of  
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9 behavior regulation. However, the lack of significant moderating effects in our study may as  
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11 well be a consequence of the difficulty finding moderator effects in field studies (McClelland  
12  
13 & Judd, 1993).  
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17 Although mother's level of education was statistically controlled in our study, the  
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19 characteristics of the sample (e.g., socio-economic background), and hence the kind of  
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21 observed and reported behavior need to be taken into account when interpreting the present  
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23 findings. Mothers in the sample tended to show higher levels of warmth than in other studies,  
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25 due to sample characteristics. Maybe, the importance of warm parenting arises primarily in  
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27 samples with higher economic backgrounds. These mothers may be more sensitive to their  
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29 children's abilities and capable of adapting their parenting to their children's developmental  
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31 skills than mothers with less economic resources (Bakermans-Kranenburg, van IJzendoorn, &  
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33 Kroonenberg, 2004).  
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39 Similarly, the moderate correlation between maternal warmth and responsiveness to  
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41 distress may be explained by measurement constraints. Both, maternal warmth and  
42  
43 responsiveness to distress, were assessed through mothers' self-reports. However, the use of  
44  
45 parental reports in the assessment of these constructs and the finding of a positive relation  
46  
47 between warmth and responsiveness to distress is consistent with prior research (e.g.,  
48  
49 Davidov & Grusec, 2006). Therefore, the level of warmth might influence the effects of  
50  
51 responsiveness, and vice versa. An alternative explanation of the shared variance between  
52  
53 warmth and responsiveness is suggested by MacDonald (1992), who claims that warmth and  
54  
55 responsiveness to distress are linked in Western cultures, but not universally. ~~This~~  
56  
57 explanation points to the necessity to integrate the role of culture into the study of parenting  
58  
59 and development (Trommsdorff, 2006, 2009b). These limitations aside, the results still  
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2  
3 demonstrate ~~unique contributions of that~~ warmth and responsiveness to distress make unique  
4 contributions to concerning different developmental domains. ~~The~~se results highlights the  
5  
6 importance of disentangling parenting typologies or styles into their distinct components  
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8 (Mize & Pettit, 1997; Stewart & Bond, 2002). Warmth and responsiveness operate in different  
9  
10 socialization domains and serve different functions for child development (Davidov & Grusec,  
11  
12 2006; Grusec & Davidov, 2007; Roberts & Strayer, 1987).  
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16  
17 Several limitations of the present study should be noted. The study included cross-  
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19 sectional data only. Although we are aware of the discussion of bidirectionality in the  
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21 socialization of children (Collins et al., 2000; Grusec, 2006; Karreman et al., 2006;  
22  
23 Trommsdorff & Kornadt, 2003), no interpretation about the direction of effects nor about  
24  
25 long-term effects in the relationships between various aspects of positive parenting and self-  
26  
27 regulation can be drawn from the present study. However, this criticism also applies to many  
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29 studies where results have been interpreted to suggest that parenting influences self-regulation  
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31 (Davidov & Grusec, 2006; Dennis, 2006; Eiden, Edwards, & Leonard, 2006). Further studies  
32  
33 should include longitudinal data to determine the direction of the relations between positive  
34  
35 parenting practices and child self-regulation. Additionally, our sample was not  
36  
37 socioeconomically diverse, and it is possible that sample characteristics (e.g., mother's  
38  
39 socioeconomic and educational background) may function as possible moderators of the  
40  
41 connection between parenting and self-regulation (Paulussen-Hoogeboom, Stams, Hermanns,  
42  
43 & Peetsma, 2007). For a better understanding of potential moderator effects, more variation in  
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45 sample characteristics is needed.  
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53 In conclusion, the pattern of results we obtained is consistent with the hypothesis that  
54  
55 maternal warmth and responsiveness to distress are distinct positive parenting practices. Each  
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57 makes unique contributions in the development of different aspects of self-regulation in  
58  
59 kindergarten children. We therefore second the proposal of Davidov and Grusec (2006) that,  
60  
contrary to the common practice of grouping warmth and responsiveness to distress together,

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3 these features of positive parenting are not interchangeable. However, further research is  
4  
5 needed to untangle the different pathways through which various parenting practices uniquely  
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7 contribute to children's different developmental outcomes. Other closely related parenting  
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9 practices, like control, should be further studied as well to avoid oversimplification of  
10  
11 complex interactions. This type of research has definite concrete applications: for early family  
12  
13 intervention programs, for promoting parents' understanding of the specificity of the  
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15 relationship between various parenting practices and their psychological meaning for different  
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17 developmental outcomes.  
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Table 1

*Descriptive Statistics (N = 101)*

	Measure	<i>M</i>	<i>SD</i>	Range
Mother's positive parenting variables	Responsiveness to distress (CCNES)	5.52	0.46	4.28-6.51
	Warmth (CRPR) <sup>a</sup>	0.64	0.18	0.22-0.84
Child variables	Internalization of rules of conduct (MRCD)	4.67	0.71	2.24-6.53
	Behavior regulation (Snack Delay)	2.56	1.93	0-6
	Effortful control (CBQ)	5.65	0.60	4.07-6.83

*Note.* <sup>a</sup> Fisher's z-scores.1  
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Table 2  
*Intercorrelations between Mother’s Positive Parenting Practices, Mother’s Level of Education, Child Age, Self-regulation, and Temperament*

N = 102	1	2	3	4	5	6	7
1. Maternal responsiveness to distress	--						
2. Maternal warmth	.26**	--					
3. Mother’s level of education	-.04	.32**	--				
4. Child’s age	.03	-.09	-.07	--			
5. Child’s internalization of rules of conduct	.21*	.11	-.01	.04	--		
6. Child’s behavior regulation	.15	.29**	.13	.03	.20*	--	
7. Child’s effortful control	.06	.04	.06	-.05	.06	.10	--

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

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Table 3

*Regression Analysis Predicting the Child's Behavior Regulation with Gender as Moderator*

Dependent Variable: Child's Behavior Regulation			
	B	SE(B)	$\beta$
Step 1: Covariates	$R^2 = .04$		
Mother's level of education	.35	.25	.14
Gender <sup>a</sup>	.61	.38	.16
Step 2: Predictors	$\Delta R^2 = .07^*$		
Responsiveness to distress	.46	.43	.11
Warmth	2.43	1.18	.22*
Step 3: Gender interaction	$\Delta R^2 = .01$		
Gender <sup>a</sup> x Responsiveness to distress	.61	.85	.10
Gender <sup>a</sup> x Warmth	1.74	2.24	.11

Note. <sup>a</sup>Dummy coded (boys = 0; girls = 1). \*  $p < .05$ .

The full regression equation was significant:  $F(6, 94) = 2.24, p < .05$ . The full model explained 6.9% of the variance (Adjusted  $R^2 = .069$ ).

Table 4

Regression Analysis Predicting the Child’s Behavior Regulation with Effortful Control as Moderator

Dependent Variable: Child’s Behavior Regulation			
	B	SE(B)	$\beta$
Step 1: Covariates	$R^2 = .03$		
Mother’s level of education	.32	.25	.13
Effortful control	.31	.33	.09
Step 2: Predictors	$\Delta R^2 = .07^*$		
Responsiveness to distress	.35	.42	.08
Warmth	2.71	1.17	.25*
Step 3: Effortful control interaction	$\Delta R^2 = .04$		
Effortful control x Responsiveness to distress	1.58	.81	2.17 <sup>+</sup>
Effortful control x Warmth	.14	2.02	.07

Note. <sup>+</sup>  $p < .10$ . \*  $p < .05$ .

The full regression equation was significant:  $F(6, 94) = 2.45, p < .05$ . The full model explained 8% of the variance (Adjusted  $R^2 = .080$ ).

Table 5

*Regression Analysis Predicting the Child's Internalization of Rules of Conduct with Gender as Moderator*

Dependent Variable: Child's Internalization of Rules of Conduct				
		B	SE(B)	$\beta$
Step 1: Covariates	$R^2 = .04$			
Mother's level of education		.00	.09	.00
Gender <sup>a</sup>		.30	.14	.21*
Step 2: Predictors	$\Delta R^2 = .06^*$			
Responsiveness to distress		.38	.16	.25*
Warmth		-.14	.47	-.03
Step 3: Gender interaction	$\Delta R^2 = .05^+$			
Gender <sup>a</sup> x Responsiveness to distress		-.29	.31	-.13
Gender <sup>a</sup> x Warmth		-1.44	.82	-.24 <sup>+</sup>

Note. <sup>a</sup>Dummy coded (boys = 0; girls = 1). <sup>+</sup>  $p < .10$ . \*  $p < .05$ .

The full regression equation was significant:  $F(6, 94) = 2.70, p < .05$ . The full model explained 9.3% of the variance (Adjusted  $R^2 = .093$ ).

Table 6

*Regression Analysis Predicting the Child's Internalization of Rules of Conduct with Effortful Control as Moderator*

Dependent Variable: Child's Internalization of Rules of Conduct			
	B	SE(B)	$\beta$
Step 1: Covariates	$R^2 = .00$		
Mother's level of education	-.01	.09	-.01
Effortful control	.07	.12	.06
Step 2: Predictors	$\Delta R^2 = .04$		
Responsiveness to distress	.32	.16	.21*
Warmth	.04	.44	.01
Step 3: Effortful control interaction	$\Delta R^2 = .06^+$		
Effortful control x Responsiveness to distress	.28	.31	1.05
Effortful control x Warmth	1.59	.76	2.23*

Note. <sup>+</sup>  $p < .10$ . \*  $p < .05$ .

The full regression equation did not reach significance:  $F(6, 94) = 1.83, p = .10$ .