



It takes more than one for parenting: How do maternal temperament and child's problem behaviors relate to maternal parenting behavior?



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ABSTRACT

The current study examined how individual differences in maternal temperament and child problem behaviors correlate with observed maternal positivity and negativity toward the child. The sample consisted of 153 mothers of 3-to-7 year old children. Mothers reported their own temperament (surgency, orienting sensitivity, effortful control and negative affect) and their children's problem behaviors. Maternal behavior was videotaped in a set of structured interaction tasks with the child during a lab visit. Results indicated that children's problem behaviors were related to less maternal positivity and more negativity. In addition, observed maternal negativity was associated with less maternal effortful control and more negative affect. In contrast, maternal temperament was unrelated to observed maternal positivity toward the child. Furthermore, maternal temperament was related to mothers' positivity and negativity but only for children high in problem behaviors. The findings implicate that child problem behaviors may interact with maternal temperament in explaining variance in caregiving positivity and negativity.

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1. Introduction

The links between adult personality and behavior are widely studied. However, not much is known about how adult personality is related to parenting behavior specifically—a noteworthy gap, given that most adults care for children for a major part of their own lifetimes, and that parenting is known to be a major life task (Clark, Kochanska, & Ready, 2000). The work that has been done in this area indicates that adult personality is an important factor in caregiving behavior (Belsky, 1984; Prinzie, Stams, Dekovic, Reijntjes, & Belsky, 2009). For example, Clark et al., 2000 found that emotional stability, openness to experience, agreeableness and conscientiousness were all associated with more positive parenting and less negative parenting (Clark et al., 2000). Furthermore, extraversion has been shown to be related to more negative parenting (Clark et al., 2000) but also more parental warmth (Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990). In a recent meta-analytic review, Prinzie and colleagues investigated the associations between Big Five personality factors and three dimensions of parenting (Prinzie et al., 2009). They found that higher levels of extraversion, agreeableness, conscientiousness, and openness and lower levels of neuroticism were all related to

more parental warmth and behavioral control. In addition, higher levels of agreeableness and lower levels of neuroticism were related to more autonomy support. Prinzie et al. (2009) concluded that “Personality can be considered an inner resource that contributes to parenting, even only to an apparently modest degree” (p. 358).

However, consideration of adult personality and its potential influences on parenting behavior also requires examination of the child's behavior, given the bi-directional (i.e., child effects on parenting, and parenting effects on child) nature of the parent-child relationship (Bell, 1968; Sameroff, 2010). That is, parents not only influence their children, but children's behavior also has an effect on parental behavior—reflecting in part the complex gene-environment processes that cause individual differences in children's behavior that can “evoke” different kinds of behavioral and emotional responses from their parents (e.g., Scarr, 1992). The child characteristics of most interest are behavior problems (Atzaba-Poria, Pike & Deater-Deckard, 2004; Clark et al., 2000; Kochanska, 1993). These behavior problems include reactive negative emotionality, opposition and noncompliance, hyperactivity, inattention, and aggression—all of which have been shown to be moderately associated with harsher and less warm caregiving (Atzaba-Poria & Pike, 2008; Deater-Deckard, Dodge, Bates, & Pettit, 1996; Putnam, Sanson, & Rothbart, 2002). This literature suggests that in part, the variability seen in parental behavior is

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evoked by children in such a way that those children who exhibit more problem behaviors tend to receive less warmth and harsher discipline from their parents (Atzaba-Poria & Pike, 2008).

We focused on parent temperament in the current study. Temperament refers to biologically-based individual differences in reactivity and self-regulation (Posner & Rothbart, 2007)—aspects of emotion, cognition and behavior that we believe may be critical to variation in parents' responses to child problem behaviors. Rothbart, Ahadi, & Evans, 2000 found substantial correlations ranging between .43 and .59 between the temperamental traits of negative affect (i.e., sadness, fear, frustration/anger, discomfort), effortful control (i.e., inhibitory and activation control, attentional focusing), surgency (i.e., sociability, sensation seeking, positive affectivity) and orienting sensitivity (i.e., threshold for sensory, affective and aesthetic cues), with the Big Five factors of neuroticism, conscientiousness, extraversion, and openness/intellect respectively. We were interested in adult temperament because it is the developmental “core” of personality, encompassing basic characteristics that seem to play an important role in adult parenting behavior (see Evans & Rothbart, 2007; Rothbart et al., 2000).

1.1. Goals of the current study

Different avenues of research converge to suggest that adults' personality correlates with parental behavior, and that parental behavior is in part evoked by children's problem behaviors (e.g., Prinzie et al., 2004). Although there is research to suggest that both are important, and that integrating the effects of children's individual differences with parenting effects can improve the understanding of the development of children's behavior (Prinzie et al., 2003), little is known about whether and how parental and child characteristics relate together to individual differences in *parental behavior*. One of the few studies investigating the concurrent effects of child and parent characteristics suggested that maternal extraversion was positively linked to power assertive parenting only for mothers of children who were high in negative emotionality. When children were low in negative emotionality, mothers' extroversion was not associated with power assertion (Clark et al., 2000). This finding suggests that children's problem behaviors create a context in which maternal characteristics may become more salient as predictors of parenting behavior, versus not predicting variance in parenting if child behavior is pleasant and generally considered easy to manage. It is clear from this study that potential transactions between child problem behaviors and parents' attributes should be considered when try to predict variance in caregiving behaviors.

To date, there is virtually no research that has examined the transactions between child challenging behavior problems and maternal temperament in explaining variance in caregiving behavior; most of the potentially relevant literature has focused on personality and parenting both as predictors of child behavior as an “outcome” (e.g., Prinzie et al., 2003). We anticipated that children's problem behaviors would moderate the links between maternal temperament and parental behaviors. Specifically, the links between parenting behavior with greater temperament-based negative affect and less positive affect, as well as less orienting sensitivity and effortful control, would be greatest when children were behaviorally hard to manage.

2. Method

2.1. Sample

One hundred sixty-one families participated in the study. Due to technical problems experienced with the videotapes, only data

for 153 families were available for coding. Mothers were 32.80 years old on average (SD = 6.17). Half of the children were female, and they were 57.29 months old on average (SD = 15.54). Two-thirds of the mothers participated by attending a laboratory visit at a downtown office in a small urban area. The other third of the sample were recruited to participate at a nearby rural university laboratory office on campus; these families were part of a different, ongoing longitudinal study of their children's development. The sample was ethnically and socioeconomically diverse, and close to being representative of the population in its geographic region of the state when compared to 2007 data from the American Community Survey of the U. S. Census Bureau (<http://www.census.gov/acs>). One-third were single mothers. Sixty-eight percent were Caucasian, 18% African American, 2% Asian, 7% multiple races, 1% other and 4% not specified. Four percent were Hispanic. Education level varied widely and was evenly distributed, with nearly one-quarter having a high school diploma/GED or less and about one-fifth having a post-graduate degree. The study was conducted in compliance with regulations from the Institutional Review Board. Participants received an honorarium.

2.2. Procedures

Informed consent was conducted by telephone prior to a scheduled visit to the laboratory, and reviewed again at the beginning of the visit. Signed consent was provided by the mother, and assent was provided by the child. Mothers completed a questionnaire prior to the visit. At the beginning of the lab visit, the mother and child were seated at a small table and were videotaped while completing three tasks together. These included an Etch-A-Sketch drawing toy task, doing a puzzle, and building a Duplo blocks model. Each task took four to five minutes. For the Etch-A-Sketch drawing task, the parent and child each was assigned a control knob and told not to touch each other's knob. They were asked to work together to copy one simple line drawing (a square) and then one complex line drawing (a smiling face). For the puzzle task, they were asked to work on a puzzle of animals together. And for the Duplo blocks, the mother was asked to show the Duplo castle to the child and instructed him/her to build a same one as the sample. During the task, mothers and children were not allowed to touch each other's Duplos. Subsequently, the videos were observed and rated by trained coders using the Parent–Child Interaction System (PARCHISY; Deater-Deckard, Pylas, & Petrill, 1997), used in a number of studies with different populations of children and caregivers, e.g., Brophy & Dunn, 2002; Corapci, Radan, & Lozoff, 2006; Hughes & Ensor, 2005).

2.3. Measure

2.3.1. Adult temperament

Participants completed the Adult Temperament Questionnaire—Short Form [ATQ-SF] (Evans & Rothbart, 2007) that includes 77 items rated on a 7-point Likert scale (1 = extremely untrue to 7 = extremely true). The ATQ-SF includes numerous facet scores and four factor scores. The Surgency scale includes three facet subscales representing sociability, positive affect, and high-intensity pleasure (α for subscales from .59 to .73). The Effortful Control scale is comprised of inhibitory control, attention control, and activation control (α for subscales from .50 to .75). The Negative Affect scale includes fear, frustration/anger, sadness, and discomfort (α for subscales from .54 to .73). Finally, the Orienting Sensitivity scale includes neutral perceptual sensitivity, affective perceptual sensitivity, and associative sensitivity (α for subscales from .53 to .72).

2.3.2. Maternal parenting behavior

Maternal negativity. Maternal negativity was measured using observers' ratings. Trained coders used the PARCHISY global ratings system (Deater-Deckard et al., 1997) to rate mother behavior during the three structured tasks with the child, using the instrument's 7-point Likert-type scales (1 = no occurrence, to 7 = continual occurrence of the behavior). During training, two raters observed the same video independently. For items with difference in rating scores, bigger than 1 on the 7-point scale, the two raters would discuss the item and resolve the discrepancy. Scores were averaged across the three tasks. To calculate the reliability of coding, we randomly selected 20% of interactions. Each coder's rating scores were treated as items and used to calculate the reliability for each item across raters using generalizability theory to estimate coefficient alpha for each item. In this context, alpha represents the overall covariance between raters while accounting for within-rater variance, such that the higher the alpha coefficient the more reliable the ratings of that item (Bakeman & Gottman, 1986, pp. 92–96).

In the current study we examined observed maternal negative affect (e.g., rejecting, frowning, cold/harsh tone; inter-rater reliability of .96), and observed negative control (e.g. use of criticism, physical control of the dials, physical control of the child's hand/arm/body; inter-rater reliability of .83). Negative control and negative affect were substantially inter-correlated, $r = .62$. Because our goal was to derive a parenting behavior composite variable that was as reliable as possible, we averaged the control and affect variables to yield a single maternal negativity score.

Maternal positivity. A maternal positivity score was derived in the same way as the negativity score, using the PARCHISY. Positivity was comprised of positive affect (i.e., verbal and non-verbal expressions of happiness, interest, affection; inter-rater reliability of .81), positive control (i.e., use of praise and encouragement, verbal elaboration of child activity; inter-rater reliability of .84), and responsiveness to child (i.e., responsiveness to child's questions, comments, behaviors; inter-rater reliability of .89). Principal components analysis revealed that these three variables loaded on a single factor explaining 65% of the variance (loadings from .76 to .84). Thus, they were averaged to compute a positivity composite score. The maternal negativity and positivity composites have been used in previous studies (AUTHOR CITATION; Browne, O'Connor, Meunier, & Jenkins, 2012).

2.3.3. Child problem behaviors

We operationalized child problem behaviors using mothers' ratings of their children's behaviors. Relevant scales from the Strengths and Difficulties Scale (SDQ; Goodman, 1997; rated on a 3-point Likert-type scale) and the Child Behavior Questionnaire Short Form (CBQ-SF; Putnam & Rothbart, 2006; rated on a 7-point Likert-type scale) were used to compute composite scores. We used the conduct problem scale ($\alpha = .63$) from the SDQ, and the activity level ($\alpha = .71$), impulsivity ($\alpha = .72$), and frustration/anger scales ($\alpha = .80$) from the CBQ-SF. The first principal component explained 53% of the variance, with loadings from .65 to .80. The individual scores were standardized, averaged, and standardized again to yield a composite z-score representing child problem behaviors. Two children had missing data on some of the CBQ-SF variables. However, we were able to retain them in study by creating their composite scores using the partial information available from the available standardized indicators in this composite score.

3. Results

3.1. Descriptive analyses

Table 1 presents descriptive of all composites and variables used in the study. Inter-correlations between temperament scales

showed that higher surgency was associated with greater orienting sensitivity and less negative affect. Greater effortful control was associated with less negative affect, lower child problem behaviors, more parental positivity and less parental negativity. Parenting positivity and negativity were negatively correlated, and also were associated with child problem behaviors. Furthermore, we examined whether children's age and gender were related to the study's variables. Correlations between children's age and all study variables were negligible (ranging between $r = .00$ and $r = -.09$), and no significant gender differences were found, with all p -values $> .10$.

3.2. Moderation analyses

A series of hierarchical regression analyses was conducted for maternal positivity and negativity separately, and for each temperament factor separately. Following Aiken and West (1991) procedures for testing interactions in multiple regression, in each analysis, child problem behaviors and maternal temperament (e.g., surgency) were entered in the first step, and the interaction term (e.g., surgency * problem behaviors) in the second step. Moderation was inferred when the interaction variable entered in the 2nd step, significantly predicted variance in parenting behavior (Aiken & West, 1991). As can be seen in Table 2, maternal effortful control as well as negative affect significantly predicted maternal negativity, such that mothers having more negative affect and less effortful control, exhibited more negative parenting behaviors. In contrast, neither surgency nor orienting sensitivity significantly predicted parental negativity.

Furthermore, higher levels of child problem behaviors statistically predicted more maternal negativity, in every equation estimated. Turning to maternal positivity, none of the maternal temperament scores predicted maternal positivity. Child problem behaviors, however, statistically predicted less maternal positivity, in all estimated equations (see Table 2).

Next, the two-way interactions between children's problem behaviors and maternal surgency, as well as between problem behaviors and maternal orienting sensitivity, were significant in the prediction of maternal positivity. Furthermore, the two-way interactions between problem behaviors and maternal effortful control, as well as problem behaviors and maternal negative affect, were significant predictors of maternal negativity. The overall models were significant, accounting for 8–12% of the variance (adjusted R^2) in maternal positivity, and 9–14% of the variance in maternal negativity.

The significant interactions were interpreted by using analysis of simple slopes at one standard deviation above and below the mean of child behavior (Holmbeck, 2002). As seen in Fig. 1a and b, the links between maternal surgency and orienting sensitivity and maternal positive parenting behavior were significant *only* for the sub-group of children with high levels of problem behaviors ($n = 23$). When children had low levels of problem behaviors ($n = 77$), these effects were non-significant. In addition, maternal effortful control and negative affect were positively related to parental negativity, but only in the presence of high child problem behavior. When children had low levels of problem behavior, effortful control and negative affect were no longer related to maternal negative behavior (see Fig. 2a and b).

Finally, as the sample included children in a large age range (3–7 years old), as well as boys and girls, we also examined whether the regression models varied by child's age or gender. For this examination we added to the regression models described above, additional two way interaction effects (e.g., 'child age' * 'maternal surgency' and 'child age' * 'child problem behavior', in the second step, and a three-way-interaction effect (e.g., 'child age' * 'child problem behavior' * 'maternal surgency'). No

Table 1
Descriptive statistics and Bivariate correlations.

	1	2	3	4	5	6	7
1. Surgency	1.00						
2. Orienting sensitivity	.16*	1.00					
3. Effortful control	.10	.10	1.00				
4. Negative affect	-.33***	.15	-.49***	1.00			
5. Child problem behaviors	-.03	.13	-.26**	.24**	1.00		
6. Maternal positivity	.13	.03	.17*	-.14	-.23**	1.00	
7. Maternal negativity	-.10	-.02	-.21*	.21**	.29***	-.28***	1.00
Means	4.64	4.75	4.55	4.09	.00	3.82	1.37
Standard deviation	.744	.85	.76	.67	.73	.59	.44

* Note. $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2
Hierarchical regression results for the prediction of maternal positivity and negativity.

	Maternal positivity		Maternal negativity	
	Step 1	Step 2	Step 1	Step 2
Child PB	-.22**	-.24**	.28***	.29***
Surgency	.10	.08	-.07	-.06
Child PB × surgency		.16*		-.05
F(sd)	(2, 148) = 4.86**	(3, 147) = 4.56**	(2, 148) = 7.23***	(3, 147) = 4.93**
R ² =	.05	.07	.08	.08
Child PB	-.23**	-.27***	.30***	-.31***
Orienting sensitivity	.06	.04	-.06	-.06
Child PB × Orienting sensitivity		.25**		-.07
F(sd)	(2, 148) = 4.26*	(3, 147) = 6.44***	(2, 148) = 7.15***	(3, 147) = 5.04**
R ² =	.04	.10	.08	.08
Child PB	-.20*	-.19*	.26***	.24**
Effortful control	.12	.12	-.16*	-.16*
Child PB × Effortful control		.14		-.18*
F(sd)	(2, 148) = 5.18*	(3, 147) = 4.57**	(2, 148) = 9.08***	(3, 147) = 8.05***
R ² =	.05	.07	.10	.12
Child PB	-.21*	-.18*	.26**	.22**
Negative affect	-.09	-.07	.16*	.14
Child PB × Negative affect		-.16		.18*
F(sd)	(2, 148) = 4.60*	(3, 147) = 4.32**	(2, 148) = 8.98***	(3, 147) = 7.94***
R ² =	.05	.06	.10	.12

Note. PB = problem behaviors.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

significant three-way interaction was revealed while investigating child age or child gender, indicating that results did not differ for older and younger children, or for boys and girls.

4. Discussion

This study is one of the first to investigate the way adult temperamental traits are related to maternal behavior as well as how maternal temperament interacts with children's behavior problems in the prediction of variance in parenting behavior. Children's problem behaviors, as reported by the mothers, were found to be related consistently to observed maternal positive as well as negative parenting behavior. Children who exhibited fewer problem behaviors were easier to manage, and had mothers who were more positive and less negative in their parenting behavior. This finding supports previous studies indicating that children's challenging behavior problems are likely to be related to harsher and less warm parental behavior as part of a bi-directional process involving child and parent effects (Clark et al., 2000; Karreman, van Tuijl, van Aken, & Dekovic, 2008; Prinzie et al., 2004).

In contrast, the evidence for links between maternal temperament and parenting behavior were less consistent, because they depended on the parenting dimension in question. Specifically, maternal parenting negativity but not positivity was significantly associated with lower maternal effortful control and higher maternal negative affect. Overall, the effects when present were modest in magnitude. The weak associations between maternal temperament dimensions and parenting behaviors may be due in part to our use of different methods and informants for temperament and parenting behavior. Most studies in the literature have used parental reports to measure both temperament and parenting behavior, thereby including method and informant bias covariance that can artificially inflate effect sizes. Thus, effect sizes are probably attenuated when predicting variance across methods and informants. Consistent with this interpretation are results from two previous studies. In one, modest associations were found between parental personality traits and observed parenting when using a multi-method design similar to ours (Karreman et al., 2008). In the other, results showed that mothers' personality predicted variance in self-reported parenting but not observed parenting (Kochanska, Clark, & Goldman, 1997). Thus, the current results

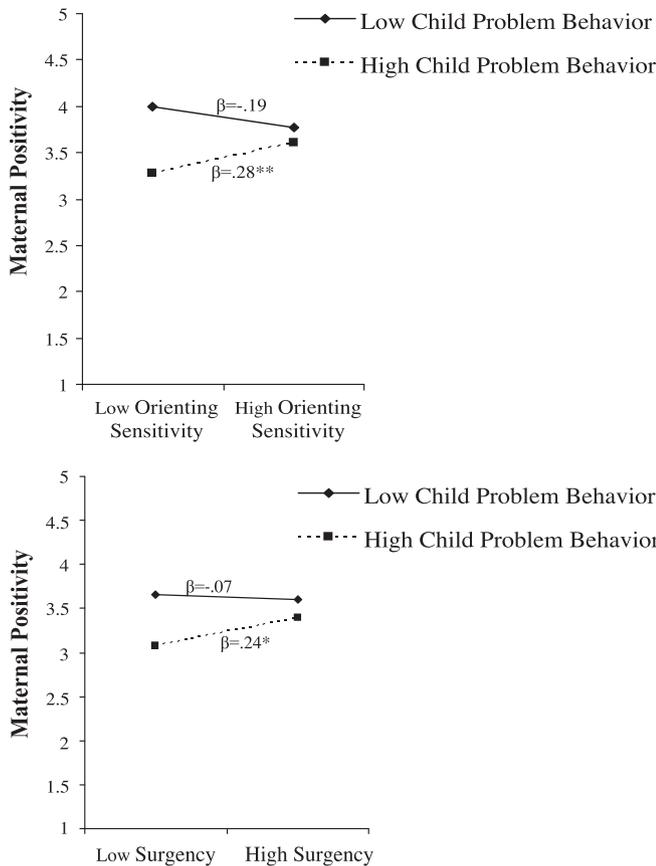


Fig. 1. (a and b) Simple slopes analysis for the links between maternal orienting sensitivity and surgency and maternal positivity by child problem behavior. * $p < .05$; ** $p < .01$.

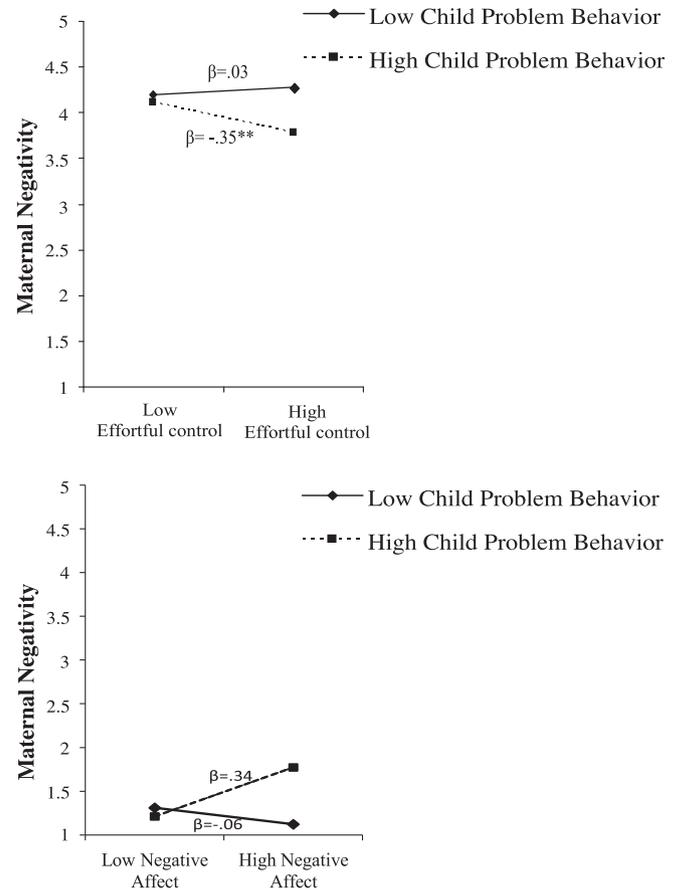


Fig. 2. (a and b) Simple slopes analysis for the links between maternal effortful control and negative affect and maternal negativity by child problem behavior. * $p < .05$; ** $p < .01$.

and prior literature reinforce the importance of using multiple informants and methods when examining predictors of parenting.

Turning to the interactive effects between maternal temperament and child behavior, the evidence was much—there were links between maternal temperament and parenting negativity and positivity, but only for those mothers who reported that their children were higher in problem behaviors. This pattern of results is consistent with Karreman et al. (2008), who found that fathers' neuroticism was positively associated with fathers' positive control and fathers' extraversion was positively associated with fathers' negative control, but only for those whose children were low in self-regulation (i.e., effortful control). Similarly, Clark et al. (2000) reported that mothers who were low in perspective taking skills were more likely to show a power-assertive parenting style, but only among mothers whose children were high in negative emotional reactivity.

Thus, maternal temperament was more strongly related to parenting in the face of challenging child behavior—consistent with the findings from Karreman et al. (2008). The consistency of the moderation effects within the current study might reflect a “level effect” of challenging child behavior. That is, individual differences in mothers' stable temperament factors become important in accounting for individual differences in parenting negativity and positivity only once child behavior problems emerge as a stressor. In contrast, parenting a well behaved child who is easier to interact with and who is more compliant and pleasant to be with is less likely to produce stressful circumstances, resulting in less invoking of reactive and dysregulated parenting behavior. Finally, no child age or gender moderation were found for these results, suggesting that the processes involving child problem behavior and maternal

temperament operate similarly for older and younger children, and for boys and girls. Although there is research to suggest that the relations between personality and parenting grow stronger with the time (Kochanska, Friesenborg, Lange, & Martel, 2004), our findings suggest that when raising a more challenging child, maternal temperamental are related to their parental practices regardless of how much experience mothers have interacting with their children. Nevertheless, it is important in future research to consider these as potential moderators of processes given that child developmental status and gender both are known to contribute to variation in parenting behavior (Karraker & Coleman, 2006; Prinzie et al., 2009).

When considering the moderation effects, it is also important to bear in mind that the two independent variables that contribute to a two-way interaction effect are always interchangeable statistically (e.g., Shannon, Beauchaine, Brenner, Neuhaus, & Gatzke-Kopp, 2007). Given that the criterion for moderation is a significant interaction between the independent variable and the moderator, deciding which variable to allocate as the moderator depends entirely on conceptual considerations when using a non-experimental design such as ours. In the current study we found that children's problem behaviors moderated the links between maternal temperament and maternal parenting behaviors. But, it may also be that maternal temperament moderated the links between children's behaviors and maternal parenting behavior. For example, maternal temperament may act to buffer or alternatively to enhance the potential deleterious effects on parenting of caring for a child with challenging behavior problems. Indeed, both probably operate simultaneously as moderators of the others' effects on

caregiving behavior—although no such causal inferences can be made conclusively in light of the correlation design.

5. Conclusions

The statistical interactions we found between maternal temperament and children's challenging behavior problems support models requiring bi-directional child and parent effects in identifying the determinants of parenting (Belsky, 1984). We revealed that child problem behaviors moderated the links between maternal temperament and maternal parenting behavior: maternal temperament was related to mothers' positivity and negativity but only if child problem behaviors were high. These findings suggest that parenting is a combination of adult's personal characteristics and the child's characteristics, and both individuals' attributes should be taken into consideration when attempting to explain variance in either one's behavior toward the other.

5.1. Limitation and future research

There are several limitations to consider. First, the cross-sectional correlational design did not permit inferences of causality. Quasi-experiments are needed before stronger inferences can be made. Second, although we used observations of maternal parenting behavior and mothers' reports of temperament, mothers also reported on child problem behaviors; the reliance on maternal reporting for both their own temperament dimensions and their perceptions of child behavior introduced some method and informant variance that could be biasing the results. Ideally, future research using another informant's reporting of child behavior (e.g., father, teacher) or observational measures of maternal temperament and/ or child behavior would ensure more accurate estimation of effects and effect sizes. Third, the findings in the current study may not generalize to fathers—an important gap that should be addressed in future research.

These limitations aside, the findings lead to a main conclusion—both maternal and child's characteristics contributed interactively to parenting behavior. Thus, when trying to understand variability in parental behavior, it is critically important to take into consideration the child's behavior as well as the parents' own individual difference attributes, and to examine these in combination.

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