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## Emerging Behavior Problems: Bidirectional Relations between Maternal and Paternal Parenting Styles with Infant Temperament

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### Abstract

The present study examined bidirectional effects between maternal and paternal parenting styles (authoritative, authoritarian, permissive) and infant temperament (negative affect, orienting/regulatory capacity, surgency) in a diverse sample of 201 mothers and 151 fathers. Using three waves of longitudinal data (prenatal, 6mo, and 18mo), this study examined: (1) whether maternal and paternal parenting styles prospectively predicted infant temperament; (2) whether mother- and father-reported infant temperament domains predicted parenting styles at 18 months; and (3) whether infant temperament and parenting styles at 6 months predicted parent-reported externalizing and internalizing problem behaviors at 18 months. Mothers and fathers reported on their expected parenting styles at all three waves, infant temperament at 6 months, and their toddler's emerging internalizing and externalizing problems at 18 months. Prospective parenting style effects revealed that maternal authoritative and permissive parenting style predicted infant orienting/regulatory capacity. Child evocative effects indicated infant orienting/regulatory capacity and negative affect predicted greater maternal permissive parenting style. Significant prospective parenting style effects on infant temperament and child evocative effects on paternal parenting style were largely not observed. Several parenting styles and infant temperament domains at 6 months predicted toddlers' externalizing and internalizing problem behaviors but results differed by parent. Findings suggest maternal prenatal perceptions of parenting style predict infant temperament, but temperament can also affect subsequent parenting. More research is needed to identify fathers' bidirectional effects including how fathering is affected by their children's characteristics.

### Keywords

Bidirectional effects; Parenting styles; Infant temperament; Cross-Lagged; Behavior Problems; Transition to parenthood

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A child's first three years of life are vitally important as all domains develop rapidly (Rayna & Laevers, 2011). Both parenting and child characteristics are important contributors to child development; yet a growing body of literature suggests children's behavior can also

affect—or evoke—different responses from their parents (Pettit & Lollis, 1997; Sameroff, Fiese, & Zigler, 2000), regarded as child evocative effects. Such reciprocal, or bidirectional, processes between parents and children may impact children’s socioemotional development, warranting greater inquiry. Of the parent and child characteristics influencing the development of children’s socioemotional problems, parenting style and children’s temperament appear salient.

Among contemporary conceptualizations of child temperament, three domains have garnered considerable research attention: effortful control, negative affectivity, and surgency/extraversion (Casalin, Luyten, Vliegen, & Meurs, 2012; Komsí et al., 2008; Putnam, Rothbart, & Garstein, 2008; Rothbart, 2011, 2012). Effortful control refers to an individual’s ability to inhibit behaviors to stimuli, to focus and shift attention, and to display perceptual sensitivity. Such effortful control during infancy is manifest in their orientation to stimuli, low threshold for pleasure, and soothability—referred to as orienting/regulatory capacity (Putnam, Helbig, Gartstein, Rothbart, & Leerkes, 2014). Negative affectivity reflects a tendency to experience sadness, frustration, fear, and anger. Surgency refers to an individual’s level of impulsivity, activity level, sensation seeking, as well as positive anticipation. Such temperament elements have been observed in infants (Niditch & Varela, 2018; Putnam, Gartstein, & Rothbart, 2006) and have demonstrated moderate stability from infancy through toddlerhood (Casalin et al., 2012; Komsí et al., 2008; Putnam et al., 2008).

All three temperament domains are linked to the emergence of behavior problems in children, namely externalizing and internalizing problem behaviors. Low effortful control, high negative affect, and low surgency are related to increased internalizing problems (Gartstein, Putnam, & Rothbart, 2012), which are expressed as fearfulness and withdrawal in toddlers (Bagner, Rodríguez, Blake, Linares, & Carter, 2012). Externalizing behavior problems are manifest in aggressive, defiant, destructive, and hyperactive behaviors (Achenbach & Rescorla, 2000; Cicchetti & Toth, 2001), expressed as hitting or biting in toddlers (Bagner et al., 2012). Similar to internalizing problems, high negative affect (Rothbart, Ahadi, Hershey, & Fisher, 2001) and low effortful control (Olson, Choe, & Sameroff, 2017) also predict increased externalizing problems but high, not low, surgency is associated with externalizing behaviors (Berdan, Keane, & Calkins, 2008). Surgency remains understudied relative to effortful control and negative affect, particularly evaluated simultaneously to disentangle their unique effects.

Importantly, although temperament may predispose a child to certain behavior problems, parenting also shapes developmental outcomes (Bornstein, Arterberry, & Lamb, 2014). Children may express adverse temperamental traits when they encounter poor quality parenting, thereby promoting more externalizing and internalizing behaviors (Belsky, 2005; Morris et al., 2002; Slagt, Dubas, Dekovi, & van Aken, 2016). Three primary parenting styles have historically attracted the most research interest: authoritative, authoritarian, and permissive (Baumrind, 1966; Smetana, 2017). An authoritative parenting style characterizes parents who display high responsiveness, demandingness, and autonomy granting with their children; an authoritarian parenting style reflects an approach wherein parents engage in low responsiveness, high demandingness, and low levels of autonomy granting; and a permissive

parenting style refers to parents who express high levels of responsiveness and autonomy granting but low levels of demandingness (Darling & Steinberg, 1993; Smetana, 2017).

Associated with maladaptive outcomes, an authoritarian parenting style is positively correlated with increased internalizing and externalizing problems (e.g., Sheh, 2013; Tavassolie, Dudding, Madigan, Thorvardarson, & Winsler, 2016); in contrast, an authoritative parenting style is associated with fewer internalizing and externalizing problems in childhood (e.g., Cheah, Leung, Tahseen, & Schultz, 2009; Im-Bolter, Yaghouh Zadeh, & Ling, 2013; Querido, Warner, & Eyberg, 2002). Permissive parenting is also associated with increased internalizing and externalizing behavior problems in children, particularly maternal permissive parenting (Pinquart, 2017; Sheh, 2013; Tavassolie et al., 2016). Nonetheless, research is often dominated by comparisons of authoritative versus authoritarian parenting, neglecting permissive parenting; statistically evaluating all three styles simultaneously permits a clearer consideration of the unique effects of each parenting style given overlap between styles.

Despite the unidirectional approach adopted by many studies wherein parent variables (e.g., parenting style) are predictors and child variables (e.g., problem behaviors) are outcomes, the current study is guided by classic theories underscoring reciprocal socialization processes transpiring between parents and children (Bell, 1968, 1979). According to such bidirectional models (e.g., Pettit & Lollis, 1997; Sameroff et al., 2000), parenting style and child temperament reciprocally influence one another and thereby contribute to children's behavior problems. During infancy, for example, parents may be described as "tuned in" to the needs of their infant, suggesting parents accommodate their parenting in response to their child; parenting can thus represent both a product and a cause of children's behavior (Patterson & Fisher, 2002). Bidirectionality between parent and child is also consistent with family systems theory (Johnson & Ray, 2016) wherein family processes are interdependent across family members—mother, father, and child. Bidirectional studies have demonstrated temperamental qualities can indeed elicit parenting behaviors, indicative of child evocative effects (e.g., Lengua & Kovacs, 2005; Planalp, Braungart-Rieker, Lickenbrock, & Zentall, 2013; Ryan & Ollendick, 2018; Scaramella & Leve, 2004); conversely, parenting can elicit specific temperamental traits (e.g., Eisenberg et al., 2005; Lee, Zhou, Eisenberg, & Wang, 2013; Scaramella, Sohr-Preston, Mirabile, Robison, & Callahan, 2008).

Cross-lagged panel studies have expressly investigated parent-child bidirectional effects using longitudinal studies (Bridgett et al., 2009; Eisenberg et al., 1999; Lee et al., 2013; Lengua & Kovacs, 2005), typically examining children's evocative effects on parenting behaviors with older children, particularly middle childhood (e.g., Eisenberg et al., 1999; Lee et al., 2013; Lengua & Kovacs, 2005). Similarly, many such panel studies consider parenting's effects on older children's temperament (Lee et al., 2013; Scaramella et al., 2008). Of the longitudinal studies with infants, one study identified greater infant negative emotions (i.e., negative affect) and lower regulatory capacity from 4 to 12 months predicted subsequent negative maternal parenting at 18 months (Bridgett et al., 2009), implying the presence of child evocative effects. Fewer longitudinal studies have examined how parenting affects infant temperament (Bridgett et al., 2009; Planalp et al., 2013)—particularly by evaluating parents' styles prospectively (i.e., prenatally). Yet a prospective assessment of

parenting would predate children's expressed temperamental characteristics to which parents could react—reflecting an ideal approach to distinguish parent effects prior to child evocative effects.

Additionally, such studies (Bridgett et al., 2009; Eisenberg et al., 1999; Lengua & Kovacs, 2005) have examined parenting behaviors (e.g., acceptance, discipline, involvement) rather than parenting styles (i.e., authoritative, authoritarian, and permissive). One notable exception demonstrated child evocative effects of low effortful control and high negative affect in 1<sup>st</sup> and 2<sup>nd</sup> grade children predicted more authoritarian parenting styles approximately four years later; high authoritarian parenting in 1<sup>st</sup> and 2<sup>nd</sup> grade children also predicted later low effortful control and high negative affect (Lee et al., 2013). Notably, only authoritative and authoritarian parenting styles, and only effortful control and negative affect temperament domains, were examined—omitting permissive parenting style and child surgency reflecting similar omissions in many studies. Furthermore, by first grade, parent-child relationships are well-established which may bias parents' reports of their child's temperament (Clark, Durbin, Donnellan, & Neppl, 2017). In contrast, the current study examined prospective parenting styles, preceding temperamental qualities displayed by their infant. Not only is infancy a critical developmental period for children marked by rapid growth (Bornstein et al., 2014), the transition to parenthood is also a major life change for adults, impacting a range of issues for both mothers and fathers, including their identity, couple relationship, and financial situation (Cowan & Cowan, 2000; Katz-Wise, Priess, & Hyde, 2010).

In addition, in terms of the extant literature on reciprocal relations between parenting and child temperament, research has traditionally focused on mothers. Considerably less research has been conducted on relations between fathers and their children's temperament, particularly bidirectional processes. Although recruitment and retention of fathers in research continues to prove challenging, fathers nevertheless merit deeper investments to secure their representation in research (Macfadyen, Swallow, Santacroce, & Lambert, 2011). A burgeoning literature has developed to consider fathers' contributions to parenting (e.g., Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Davison, Charles, Khandpur, & Nelson, 2017; Lamb & Lewis, 2013). Some literature points to possible mother-father differences in relation to children's behavior problems (e.g., Rinaldi & Howe, 2012; Tavassolie et al., 2016) whereas others suggest mothers and fathers adopt comparable parenting approaches (Fagan, Day, Lamb, & Cabrera, 2014; Deschênes, Bernier, Jarry-Boileau, & St-Laurent, 2014). Family systems theory emphasizes interdependence between mothers and fathers (Johnson & Ray, 2016) in which mothers and fathers may operate in tandem. Consistent with such a family systems perspective, more dyadic research is needed that directly considers mothers and father jointly to distinguish their communalities and distinctions.

Therefore, the current study sought to advance our understanding of the reciprocal relations between maternal and paternal parenting styles and infant temperament in predicting the emergence of problem behaviors. Specifically, to evaluate bidirectional effects in the development of behavior problems and address gaps in the literature, this study: (1) incorporated all three infant temperamental dimensions of orienting/regulatory capacity

(ORC), negative affectivity, and surgency simultaneously; (2) evaluated all three parenting styles simultaneously (i.e., authoritative, authoritarian, and permissive); (3) studied both mothers and fathers, including dyadic analyses nesting couples within a family to facilitate mother-father comparisons; (4) considered child evocative effects from infant (temperament) to parent (subsequent parenting styles); and (5) predicted infant temperament from parenting style assessed prospectively (prenatally), before the infant could evoke a parenting response. The current study utilized a longitudinal, cross-lagged design across the transition to parenthood. We anticipated prospective authoritative parenting style would predict higher ORC, lower negative affect, and lower surgency in infants and lower externalizing and internalizing behavior problems in toddlers, whereas authoritarian and permissive parenting styles would predict lower ORC and higher negative affect in infants and higher externalizing and internalizing behavior problems in toddlers. We anticipated higher infant ORC and lower negative affect would predict more subsequent authoritative parenting and lower authoritarian and permissive parenting styles, with the effects of infant surgency on later parenting style exploratory.

## Method

### Participants

The current sample involved participants in the prospective longitudinal cohort of the “Following First Families” (Triple-F) Study with three completed waves of data collection to date. The initial sample was recruited from Birmingham, Alabama when the primiparous mother was within her third trimester of pregnancy (henceforth called Time 1 or T1). The racially and socioeconomically diverse sample consisted of 203 mothers and 151 of the mother’s male partners (86% of those available, hereafter called fathers). Follow up of the mothers and available fathers occurred when the child was 6 months old ( $\pm 2$  weeks; henceforth called Time 2 or T2) and when the child was 18 months old ( $\pm 3$  weeks; henceforth called Time 3 or T3). Due to the changing nature of family compositions, some father-figures were involved at T1 but not at T2 or T3, whereas others were not involved at T1 but became involved at either T2 or T3; only data from same-fathers are included in the analysis. Two babies died shortly after childbirth and thus those families were no longer eligible to continue in Triple-F. Of the 201 remaining families initially recruited, T2 data were available for 186 mothers and 146 fathers (>92% of available fathers). T3 data were available for 180 mothers and 146 fathers. Missing data for either mothers or fathers were estimated (see Data Analytic Plan below).

Descriptive characteristics of the sample are presented in Table 1. At T1, mothers were on average 26.04 ( $SD = 5.87$ ) years old; fathers were on average 28.89 ( $SD = 6.07$ ) years old. Over 42% of mothers were receiving public assistance. Over half reported an annual household income under \$40,000 with 49.8% of the sample within 150% of the federal poverty line. The Triple-F study oversampled for risk. At T1, 53.7% of mothers evidenced sociodemographic risk, meeting at least one of the following criteria: (a) receipt of public assistance; (b) 150% below the federal poverty line; (c) high school education or less; or (4) age 18 or younger.

## Procedures

Primiparous mothers were recruited for the Triple-F study using flyers distributed to eligible mothers at local area obstetric/gynecologists' clinics and childbirth classes. Mothers interested in participating contacted the lab at T1 to schedule a 2.5 hour appointment for themselves, and when available, the father. At T2 and T3, mothers were scheduled for a 3 hour appointment for themselves, and when available, the father. At each wave, informed consent was obtained from each parent for themselves and their child. Mothers and fathers completed the protocol in separate rooms, independently reporting on their parenting style, infant temperament, and child behavior problems. Across all time points, measures were delivered electronically via a laptop with headphones. All study procedures were approved through the Institutional Review Board at the University of Alabama at Birmingham, "Triple-F Study: Following First Families" IRB-130626002.

## Measures

**Parenting Styles**—At each wave, parents' expected parenting style was assessed by self-report of how they will parent their child via a modified Parental Authority Questionnaire, the Future Parental Authority Questionnaire (Boppana & Rodriguez, 2017). Parents rated 30 items using a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"), with subscales summed to create Authoritative, Authoritarian, and Permissive parenting style scores. Scores for each 10-item subscale range from 10 to 50 with higher scores reflecting greater endorsement of that style. Both mothers' and fathers' Authoritative ( $\alpha = .74 - .90$ ), Authoritarian ( $\alpha = .80 - .86$ ), and Permissive ( $\alpha = .78 - .83$ ) scales had acceptable reliability in this study across time points.

**Infant Temperament**—At T2, parents reported on their child's temperament via the Very Short Form of the Infant Behavior Questionnaire-Revised (IBQ-R) (Putnam et al., 2014). Thirty-seven items were rated by parents using a 7-point Likert scale (1 = "never" to 7 = "always") comprising three subscale scores, including Orienting/Regulatory Capacity (ORC), Negative Affect, and Surgency. Higher scores indicate greater endorsement of that temperament domain. The IBQ-R Very Short Form demonstrates adequate internal consistency and test-retest reliability (Putnam et al., 2014). In this study, both mothers' and fathers' report on the ORC ( $\alpha = .73 - .79$ ), Negative Affect ( $\alpha = .79 - .81$ ), and Surgency ( $\alpha = .73 - .76$ ) scales demonstrated acceptable reliability.

**Children's Behavior Problems**—At T3, parents reported on their child's emerging behavior problems using the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Carter & Briggs-Gowan, 2006). The 44-item BITSEA assesses externalizing, internalizing, and regulatory problems. Parents estimated how true each statement was for their child on a 3-point Likert scale (0 = not true/rarely, 1 = somewhat true/sometimes, 2 = very true/often) with higher scores indicating more problem behaviors. For this study, only the externalizing and internalizing subscales were used. The BITSEA demonstrates acceptable internal consistency (Briggs-Gowan et al., 2013). In this study, reliability of mothers' and fathers' report of their children's internalizing behaviors ( $\alpha = .77 - .79$ ) was within acceptable levels; reliability of mothers' and fathers' report of their children's externalizing behaviors was modest ( $\alpha = .61 - .63$ ).

**Covariates**—At each wave, parents reported their age, highest education level, and income. Because correlations between parental income and education level were moderate to high ( $r = .53 - .76, p < .01$ ), parental socioeconomic status was estimated by standardizing and combining income and educational level to create a composite SES variable for each time point.

### Data Analytic Plan

Using SPSS 24, descriptive statistics were calculated and differences between mothers' and fathers' reports evaluated. In addition, correlations were performed for all outcome measures, including assessing the need for demographic covariates in the main analyses.

Cross-lagged structural equation models were evaluated using MPlus version 7.11 with Full Information Maximum Likelihood (FIML) estimation with robust standard errors to handle missing data by using all available data for a parent if not present during a given time point. Path models of parenting styles predicting toddlers' T3 behavior problems were estimated for mothers and fathers independently (which allowed for all three parenting styles, all three temperament domains, and internalizing and externalizing behaviors to be tested simultaneously for the full sample of mothers and fathers). Three additional dyadic models were tested for each separate parenting style for mothers and fathers simultaneously. The dyadic path models thus estimate the effects for mothers and fathers in light of their interdependence within the same couple unit, permitting mother-father comparisons. For these dyadic analyses, 27 mothers without participating fathers were removed; these analyses thus involve a more restricted sample of mothers (e.g., excluding single mothers) and do not examine the unique effects of a parenting style because all three are not embedded within a given dyadic model.

Model fit was evaluated with comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root-mean-square residual (SRMR). CFIs greater than .95 and SRMR less than .08 indicate adequate model fit (Hu & Bentler, 1999). For RMSEA values, an upper bound of its confidence interval (CI) greater than .10 indicates poor fit, and a lower bound of its confidence interval less than .05 suggests good fit (Kline, 2016).

## Results

### Preliminary Analyses

As seen in Table 2, paired sample t-tests indicated that, compared to fathers, mothers reported significantly higher authoritative parenting style, higher ORC and surgency in their infants, as well as more externalizing problem behaviors in their toddlers. Bivariate correlations for all variables of interest appear in Table 3.

Maternal age across time was consistently and significantly associated with toddlers' behavior problems ( $r = -.253$  to  $-.261, p = .001$  and  $r = -.275$  to  $-.293, p = .001$ , externalizing and internalizing respectively) and paternal age across time was significantly associated with child internalizing ( $r = -.310$  to  $-.376, p = .001$ ). Moreover, maternal SES across time was significantly related with child internalizing ( $r = -.241$  to  $-.311, p = .001$ )

and externalizing ( $r = -.202$  to  $-.260$ ,  $p = .007$ ), and paternal SES across time was significantly related with child internalizing ( $r = -.258$  to  $-.351$ ,  $p = .001$ ). Thus, parental age and SES were included as time-varying covariates within all individual path models. To limit the number of parameter estimations within dyadic models, only SES was selected as the time-varying covariate (maternal and paternal age and SES were highly correlated for mothers and fathers,  $r = .691$  to  $.686$ ).

### Path Analyses

To investigate bidirectional effects of infant temperament with parenting styles, path models were estimated for mothers and fathers independently (see Table 4), applying time-varying covariates of age and SES. Three additional dyadic models were fit which included one parenting style for mothers and fathers simultaneously (see Table 5). Path analyses produced theoretically meaningful modification indices that added paths from T1 to T3 parenting styles. With the addition of these pathways, all models demonstrated good fit.

**Mothers' Individual Path Model**—An analysis for mothers (see Figure 1), including the covariates of age and SES, indicated model fit was strong: RMSEA = .031, CI [.000, .052]; SRMR = .042; CFI = .994. All three parenting styles remained stable over time. As seen in Table 4, mothers' higher T1 authoritative parenting style prospectively predicted infants' greater T2 ORC ( $\beta = .312$ ,  $p = .001$ ) and higher maternal T1 permissive parenting style predicted lower infants' T2 ORC ( $\beta = -.173$ ,  $p = .042$ ). With respect to predicting children's behavior problems from T2 parenting styles, higher maternal T2 authoritative parenting style predicted toddlers' lower T3 internalizing problem behaviors ( $\beta = -.162$ ,  $p = .021$ ); however, mothers' higher T2 authoritarian ( $\beta = .158$ ,  $p = .014$ ) and T2 permissive parenting style ( $\beta = .346$ ,  $p = .001$ ) predicted toddlers' greater T3 internalizing problem behaviors. Of the three parenting styles, only higher maternal T2 permissive parenting style predicted toddlers' greater T3 externalizing problem behaviors ( $\beta = .196$ ,  $p = .008$ ). Considering child evocative effects, only higher infants' T2 ORC predicted more maternal T3 permissive parenting style ( $\beta = .120$ ,  $p = .023$ ). In addition, with regard to temperament effects on emerging behavior problems, infants' higher T2 negative affect predicted toddlers' greater T3 internalizing problem behaviors ( $\beta = .226$ ,  $p = .007$ ).

**Fathers' Individual Path Model**—Path analysis of fathers' data (see Figure 2), including the covariates of age and SES, indicated model fit was good: RMSEA = .066, CI [.048, .083]; SRMR = .066; CFI = .966. All three parenting styles remained stable across the three time points. As seen in Table 4, higher paternal T2 authoritative parenting style significantly predicted toddlers' lower T3 internalizing problem behaviors ( $\beta = -.236$ ,  $p = .007$ ); higher fathers' T2 permissive parenting style predicted toddlers' greater T3 internalizing problem behaviors ( $\beta = .140$ ,  $p = .038$ ). Note that none of fathers' T1 parenting styles prospectively predicted T2 infant temperament dimensions. Additionally, fathers' reports on infants' T2 temperament domains did not predict subsequent paternal T3 parenting styles; thus for fathers, there was no evidence of child evocative effects. With regard to temperament effects on behavior problems, infants' higher T2 ORC predicted toddlers' lower T3 externalizing problems ( $\beta = -.271$ ,  $p = .007$ ). Infants' higher surgency at T2 predicted toddlers' greater



T3 externalizing problems ( $\beta = .296, p = .002$ ) and infants' higher T2 negative affect predicted toddlers' greater T3 internalizing problems ( $\beta = .346, p = .001$ ).

**Dyadic Path Models**—Analyses for dyadic models (see Table 5) concentrated on a single parenting style including both parents nested within a family in the model simultaneously. The dyadic models of authoritative parenting style (model fit: RMSEA = .048, CI [.030, .063]; SRMR = .055; CFI = .971), authoritarian parenting styles (model fit: RMSEA = .030, CI [.000, .049]; SRMR = .050; CFI = .988), and permissive parenting styles (model fit: RMSEA = .051, CI [.035, .066]; SRMR = .060; CFI = .968) revealed essentially similar effects as the individual models for mothers and fathers.

Only maternal prospective authoritative parenting style remained predictive of infants' ORC ( $\beta = .219, p = .001$ ). Additionally, more child evocative effects were apparent in the dyadic model. Specifically, higher infants' T2 negative affect ( $\beta = .112, p = .040$ ) and higher T2 ORC ( $\beta = .148, p = .007$ ) predicted greater maternal T3 permissive parenting style. Across dyadic models, fathers continued not to demonstrate child evocative effects, but one prospective effect became apparent. Specifically, paternal prospective authoritative parenting style was predictive of infants' ORC ( $\beta = .189, p = .048$ ). Additionally, higher T2 authoritative parenting was observed to significantly predict toddler's lower T3 externalizing problems ( $\beta = -.211, p = .012$ ).

To evaluate significant differences between mothers and fathers, coefficients for a given path between mothers and fathers were constrained to equal, determining whether paths were equivalent and identifying significant Wald statistics as evidence of significant mother-father differences. Only five statistically significant differences were observed. For the authoritative dyadic model, paternal T2 authoritative parenting style predicting toddlers' T3 externalizing behaviors significantly differed from the comparable path for mothers: Wald(1) = 5.080,  $p = .024$ . Fathers' reports of infant T2 surgency predicting toddlers' T3 externalizing behaviors significantly differed from mothers: Wald(1) = 8.032,  $p = .005$ . For the authoritarian dyadic model, paternal report of infant T2 surgency predicting toddlers' T3 externalizing behaviors significantly differed from mothers: Wald(1) = 6.302,  $p = .012$ . For the permissive dyadic model, paternal report of T2 infant surgency predicting toddlers' T3 externalizing behaviors significantly differed from mothers: Wald(1) = 8.542,  $p = .003$ . Maternal report of infant T2 ORC predicting mothers' T3 permissive parenting style significantly differed from fathers: Wald(1) = 4.350,  $p = .037$ .

## Discussion

The present study sought to explore potential bidirectional effects between infant temperament and maternal and paternal parenting styles in predicting toddler internalizing and externalizing behavior problems. Partial support was observed for parenting style prospectively predicting infants' temperament dimensions primarily for mothers. Higher maternal (and possibly paternal) authoritative parenting style prospectively predicted higher infant ORC whereas higher maternal permissive parenting style predicted lower infant ORC. In terms of child evocative effects of infant temperament, infants' ORC predicted higher maternal permissive parenting style with some indications that infants' greater negative

affect also predicts subsequent maternal permissive parenting. With regard to predicting toddlers' emerging problem behaviors, maternal and paternal authoritative parenting styles predicted lower internalizing problems, with some indications that paternal authoritative parenting also predicts lower externalizing problems. In contrast, maternal authoritarian parenting style predicted higher internalizing problems whereas maternal and paternal permissive parenting predicted greater internalizing problems and maternal permissive parenting style predicted greater externalizing problems. Finally, with regard to infant temperament predicting problem behaviors regardless of parenting style, greater infant negative affect predicted subsequent externalizing problems according to mothers and more internalizing problems according to fathers. Fathers' report of lower infant ORC and greater surgency also predicted later externalizing problems.

Congruent with the present findings, past research has identified positive associations between higher maternal authoritative parenting and higher effortful control (Eisenberg et al., 2005), which the current study extends prospectively. Mothers who are more inclined to be authoritative may encourage autonomy within their children, thus providing opportunities for the child to develop self-regulatory abilities, manifest as orienting/regulatory capacity—a finding echoed among fathers in the more restricted dyadic analyses. In addition, maternal permissive parenting style prenatally predicted subsequent lower infant ORC. Permissive mothers may express warmth but not offer the support needed for infants to successfully develop ORC. This latter prospective finding was not observed when permissive parenting was examined individually in the dyadic model, suggesting that the limit-setting quality of authoritative parenting may be a critical element in promoting ORC. No other pathways were statistically significant for mothers' parenting styles to prospectively predict infants' temperaments. Such findings are surprising given earlier findings, particularly regarding authoritarian parenting style predicting children's later high negative affect and low effortful control (Lee et al., 2013). However, our findings may reflect that we were expressly interested in the effects of prospective expectations for parenting styles, which would not be colored by parents' experiences of their infants' characteristics, given that others have considered bidirectional effects with older children (Eisenberg et al., 1999; Lee et al., 2013; Lengua & Kovacs, 2005). The more limited findings on prospective parenting style predicting infant temperament for fathers may be a reflection that mothers and fathers significantly differed in their characterization of their infants. Prior work has demonstrated similarities but also differences between expectant mothers' and fathers' prenatal expectations of their child's temperament (Diener, Goldstein, & Mangelsdorf, 1995; Gagne, Prater, Abramson, Mankuta, & Knafo-Noam, 2015). Infant temperament can in fact be predicted by fetal physiological markers (Werner et al., 2007), which may differentially influence mothers' perceptions of infant temperament.

Limited child evocative effects were observed from infants' temperaments at 6 months affecting subsequent parenting styles. Based on the dyadic model, our findings on infant negative affect are somewhat consistent with prior research on the child evocative effects of negative affect on negative parenting (Lee et al., 2013), particularly with infants (Bridgett et al., 2009). Our findings suggest potential child evocative effects of maternal report of infant negative affect on greater subsequent permissive parenting (although authoritarian parenting is also considered negative parenting, those effects were only marginal). Interestingly, infant

temperament was not predictive of parents' authoritative parenting style. However, one study observed stronger associations between children's temperament and negative parenting styles (e.g., authoritarian and permissive parenting styles) than with positive parenting (e.g., authoritative parenting style) (Ganiban, Ulbricht, Saudino, Reiss, & Neiderhiser, 2011).

The current study also observed that *higher* reported infant ORC predicted higher maternal permissive parenting styles, contrary to expectations and previous literature with older children (Lee et al., 2013), and significantly different from fathers. Potentially, infants who are successful in regulating their emotions have mothers who then allow for more latitude with their children. Research has rarely examined the statistical effects of permissive parenting simultaneously with authoritative and authoritarian parenting, particularly with regard to child evocative effects. Whether such child evocative patterns persist with permissive parenting as children mature is unclear, signaling the importance of incorporating permissive parenting assessment beyond the traditional focus on authoritative and authoritarian parenting styles.

Interestingly, no significant child evocative effects were identified for fathers. Perhaps fathers limit infants' activities (Brachfeld-Child, 1986) or engage in fewer activities with their infants (Belsky, Gilstrap, & Rovine, 1984; Lamb & Lewis, 2013). Thus, the behaviors exhibited by children with fathers may differ from mothers, which in turn may influence how fathers respond to their children's temperament. The development of a fatherhood identity may be experienced more abruptly for fathers, who thereby respond to the transition to parenthood differently from mothers (Höfner, Schadler, & Richter, 2011; Katz-Wise et al., 2010). Given the continuing dearth of research on fathers in the literature, particularly pertaining to bidirectional effects, continued efforts are needed to incorporate their perspectives. Such future research can attempt to replicate whether fathers' characterization of their infants' temperament indeed do not affect their subsequent parenting approaches.

Results of the current study provide partial support for parenting styles predicting toddlers' externalizing and internalizing behavior problems, even at this young developmental period. Congruent with previous literature on older children (Tavassolie et al., 2016), authoritative maternal and paternal parenting styles predicted lower toddler internalizing problems and paternal authoritative parenting predicted lower externalizing behavior problems. Mothers' authoritarian parenting predicted higher internalizing problem behaviors, consistent with prior research (Tavassolie et al., 2016), but did not predict mothers' report of toddler externalizing problems; fathers' authoritarian parenting style did not predict either externalizing or internalizing problem behaviors, which diverges from the limited current literature that considers both mothers and fathers (e.g., Rinaldi & Howe, 2012). Finally, maternal permissive parenting predicted greater externalizing and internalizing problem behaviors, consistent with prior work (Pinquart, 2017; Rinaldi & Howe, 2012; Sheh, 2013; Tavassolie et al., 2016), whereas paternal permissive parenting styles predicted greater internalizing problem behaviors rather than externalizing problem behaviors—in contrast to previous literature with older children in which paternal permissive parenting predicted externalizing, not internalizing, problems (Tavassolie et al., 2016). Differences in the current study from prior work may be attributable to our multilevel modeling approach that evaluated all three parenting styles simultaneously (controlling for shared qualities between

styles) and both internalizing and externalizing problems simultaneously (controlling for their overlap). Moreover, differences in our study may be due to the comparatively limited number of fathers in previous studies (e.g.,  $n = 59$ , Rinaldi & Howe, 2012;  $n = 63$ , Tavassolie et al., 2016) that have involved relatively racially/ethnically homogenous and more affluent samples (i.e., mainly White higher-SES families), reducing the generalizability of earlier studies. Our larger sample of fathers was socioeconomically and racially diverse.

Although not the central focus of the current study, we also evaluated whether parental reports of infants as young as 6 months would predict their emerging behavior problems at 18 months. Infant negative affect predicted mothers' report of greater externalizing and fathers' report of greater internalizing, consistent with earlier findings (Gartstein et al., 2012; Rothbart et al., 2001). Fathers' reports of lower infant ORC and greater infant surgency also predicted greater externalizing behavior problems, findings that have been previously observed based primarily on mothers' reports (Gartstein et al., 2012; Olson et al., 2017). Note that the effects of infant temperament predicting problem behaviors were more consistent across father-reported temperament and behavior problems than for mothers, as evident in the dyadic models. Despite increasing paternal involvement with children (Cabrera et al., 2000), perhaps mothers' more consistent caretaking role led to greater exposure to changes in their infants during the course of this study that may have been less apparent to fathers. Such findings contribute to the literature given the limited prior work with fathers, highlighting the value of involving fathers more frequently in research studies as a distinct parenting viewpoint. A growing body of work has begun to recognize fathers' contributions to the family and the importance of the father-child relationship, but more research is clearly needed (Cabrera et al., 2000; Davison et al., 2017).

One of the major limitations of this study was the reliance on parent-reported infant temperament and toddler externalizing and internalizing behavior problems. Although parent report is the most widely used technique to assess temperament (Rettew & McKee, 2005), other methods could be utilized to assess temperament and behavior problems, including teacher reports (e.g., Graves, Blake, & Kim, 2012; although our sample focused on infancy) or observational and laboratory approaches (e.g., Leerkes & Crockenberg, 2010). It would also be interesting to investigate prenatal expectations of their child's temperament, rather than assessing temperament at 6 months of age, as previous research suggests that parent impressions of a child's temperament is partially formed by birth (Gagne et al., 2015). Indeed, such parental expectations of child temperament may continue to impact their perceptions of their children broadly, highlighting again the need to evaluate child evocative effects independent of parent perceptions. The present study further assessed parenting styles through self-reports rather than through direct observations, although parenting styles may be difficult to distinguish and complex to observe (Gardner, 2000). Alternatively, to avoid single-source bias, future research could consider whether the parenting style reported by one parent relates bidirectionally to the report of child temperament or behavior problems reported by the other parent. Furthermore, although the BITSEA was designed for children in this age group, the reliability for both mother- and father-report of toddler externalizing behavior problems was modest, which could arise from measuring socioemotional behaviors in such young children, although early identification of toddlers' behavior problems has

been considered critical for early intervention (e.g., Bagner et al., 2012). Although we focused on a prospective design from pregnancy, it would be particularly intriguing to evaluate whether prenatal assessments can demonstrate bidirectional effects for children as they enter preschool years and beyond.

Additionally, the current study focused upon the influences of individual parents' parenting styles rather than whether the two parents approach parenting differently. Past research suggests relatively modest agreement in parenting approaches within a mother-father dyad (Cowan, Cowan, & Kerig, 1993), whereas others show evidence that parents tend to adopt similar parenting styles as their partners (Winsler et al., 2005). Given that the parenting of mothers and fathers are intertwined, consistent with family systems theory (Johnson & Ray, 2016), future studies should consider not only the effects of individual parenting on children but their combined impact on the development of infant and toddler socioemotional behaviors as well. Furthermore, although this study evaluated three parenting styles simultaneously, each parenting style was considered distinct; however, conceptually, the styles may overlap. For example, a parent may display a combination of low authoritarian but both high authoritative and permissive qualities. Increasing the overall sample size, as well as the number of fathers, could also permit analyses of interaction effects between different temperament dimensions with parenting styles. Finally, although this study incorporated a socioeconomically and racially diverse sample in a longitudinal design, proportionally fewer parents identified as Hispanic/Latino, who warrant further research.

This study contributes to our understanding of the bidirectional effects for both mothers and fathers and child characteristics and their relation to the development of behavior problems by focusing on the critical developmental period of infancy and toddlerhood. Notably, the findings highlight the adverse effects of permissive parenting styles, the role of infants' negative affect and orienting/regulatory capacity on subsequent parenting, and the role of mothers and fathers in these bidirectional relations. Furthermore, this study suggests even prenatal conceptions of how one will parent may relate to infants' temperament after they are born—potentially via both environmental and genetic influences—highlighting the potential benefits of prenatal parenting programs that provide guidance to new parents. Overall, this study illustrates the complicated bidirectional processes involved across the transition to parenthood and the importance of examining not only parenting effects but also the role of children in terms of child evocative effects that may culminate in children's adverse socioemotional outcomes.

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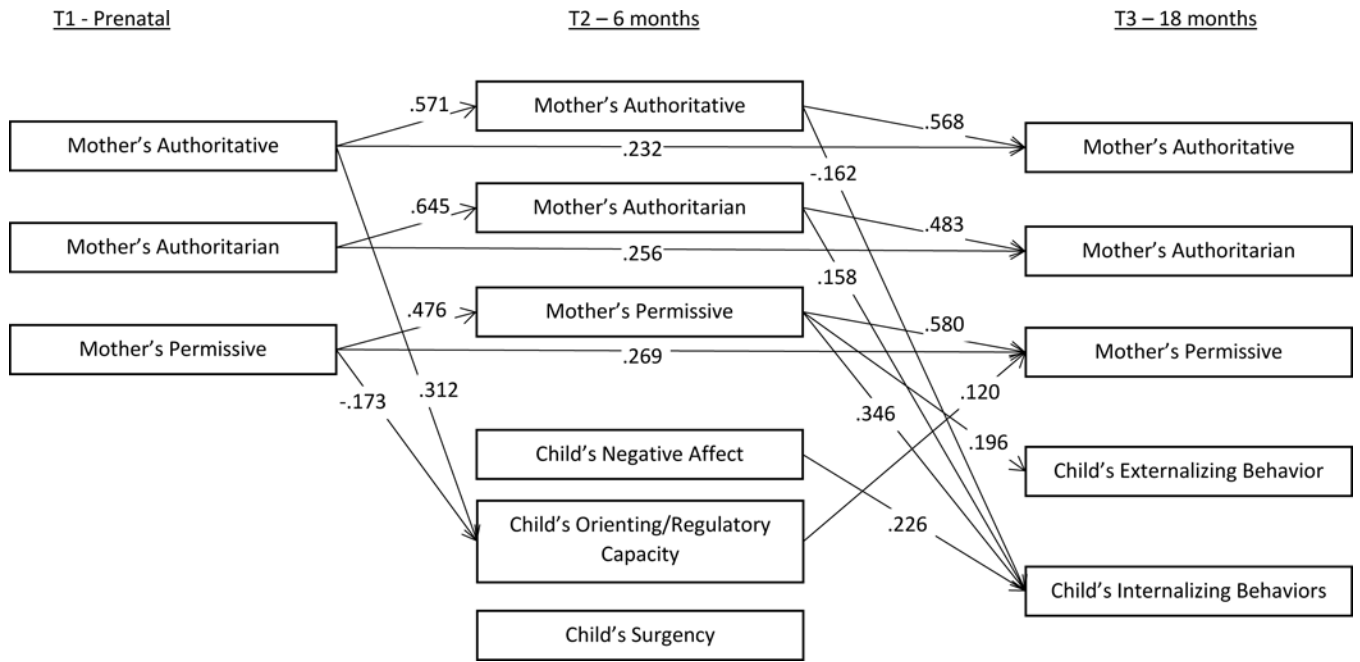
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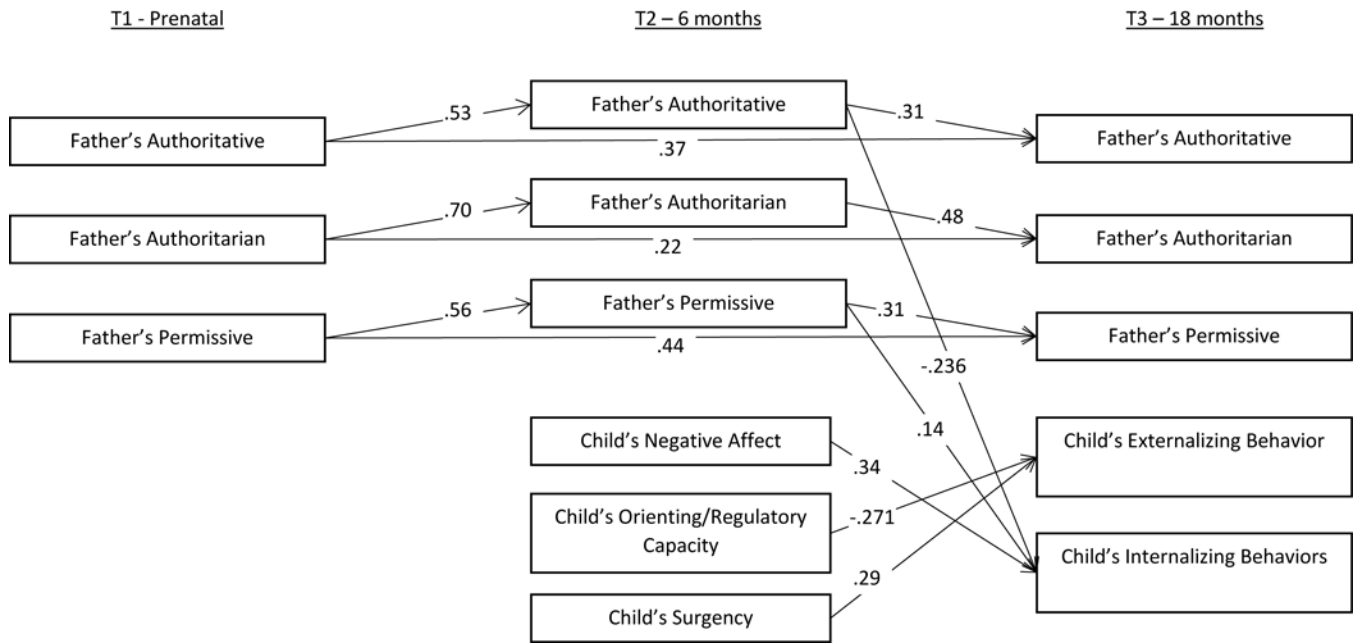
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**Figure 1.** Path model predicting the relationships of mothers' parenting styles and infant temperament and toddler behaviors with standardized coefficients. All relevant pathways were modeled, but only significant pathways are included within in the figure. Solid lines indicate statistical significance between two variables. All pathways include maternal age and SES as covariates.



**Figure 2.** Path model predicting the relationships of fathers' parenting styles and infant temperament and toddler behaviors with standardized coefficients. All relevant pathways were modeled, but only significant pathways are included within in the figure. Solid lines indicate statistical significance between two variables. All pathways include paternal age and SES as covariates.

**Table 1**

Sample Descriptive Characteristics by Time Point

	Time 1 Prenatal		Time 2 6 months		Time 3 18 months	
	Mother <i>M (SD) or n (%)</i>	Father <i>M (SD) or n (%)</i>	Mother <i>M (SD) or n (%)</i>	Father <i>M (SD) or n (%)</i>	Mother <i>M (SD) or n (%)</i>	Father <i>M (SD) or n (%)</i>
Age	26.04 (5.87)	28.89 (6.07)	26.78 (5.76)	29.47 (6.16)	27.62 (5.86)	30.43 (6.26)
Race						
Caucasian	102 (50.7%)	81 (55.5%)	95 (51.1%)	83 (58.5%)	88 (48.9%)	81 (57.0%)
African American	94 (46.8%)	64 (43.8%)	87 (46.8%)	58 (40.8%)	87 (48.3%)	61 (43.0%)
Asian	2 (1.0%)	1 (0.7%)	2 (1.1%)	1 (0.7%)	2 (1.1%)	
Native American/Native Alaskan	3 (1.5%)		2 (1.1%)		3 (1.7%)	
Ethnicity						
Not Hispanic	195 (97.0%)	141 (96.6%)	180 (86.8%)	136 (95.8%)	174 (96.7%)	135 (95.7%)
Hispanic	6 (3.0%)	5 (3.4%)	6 (3.2%)	6 (4.2%)	6 (3.3%)	6 (4.3%)
Education Level						
Grade School	1 (0.5%)		4 (2.2%)	1 (0.7%)	1 (0.6%)	1 (0.7%)
Some High School	22 (10.9%)	12 (8.2%)	14 (7.5%)	12 (8.5%)	12 (6.7%)	5 (7.7%)
Completed High School	38 (18.9%)	25 (17.1%)	31 (16.7%)	18 (12.7%)	33 (18.3%)	28 (19.7%)
Some College	42 (20.9%)	34 (23.3%)	41 (22.0%)	38 (26.8%)	45 (25.0%)	37 (26.1%)
Completed College	43 (21.4%)	41 (28.1%)	42 (22.6%)	39 (27.5%)	38 (21.1)	38 (26.8%)
Above College	55 (27.4%)	34 (23.2%)	54 (29%)	34 (23.9%)	51 (28.3)	27 (19.0%)
Gender: Male Child			98 (53.2%)		95 (52.8%)	

**Table 2**  
Means and Standard Deviations of Parenting Styles, Child Temperament, and Child Behavior Problems, by Parent

	T1 Prenatal		T2 6 months		T3 18 months	
	Mother	Father	Mother	Father	Mother	Father
Parenting Styles						
Authoritative	<b>42.62 (4.88)</b>	<b>41.45 (5.74)</b>	<b>42.01 (5.92)</b>	<b>40.91 (6.26)</b>	<b>41.87 (6.06)</b>	<b>40.51 (6.91)</b>
Authoritarian	34.20 (6.53)	34.03 (6.75)	33.69 (6.55)	33.57 (7.28)	34.11 (6.74)	32.54 (7.20)
Permissive	23.81 (6.88)	23.34 (6.77)	23.95 (7.02)	24.73 (7.37)	25.15 (7.29)	23.59 (6.10)
Temperament Style						
Negative Affect	--	--	3.83 (1.03)	3.67 (0.95)	--	--
Orienting/Regulatory Capacity	--	--	<b>5.63 (0.74)</b>	<b>5.27 (0.75)</b>	--	--
Surgency	--	--	<b>5.16 (0.81)</b>	<b>4.75 (0.84)</b>	--	--
Problem Behaviors						
Externalizing	--	--	--	--	<b>3.73 (2.47)</b>	<b>2.90 (2.10)</b>
Internalizing	--	--	--	--	5.81 (3.93)	5.45 (3.64)

Note. Means with standard deviations in parentheses. **Bolded** values indicate statistical differences between mothers and fathers at  $p < .05$ .

**Table 3**

Correlations between Parenting Styles, Child Temperament, and Child Problem Behaviors, by Parent

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. T1 ATV		<b>0.527</b>	<b>0.521</b>	-0.016	-0.128	-0.169	-0.060	-0.17	-0.082	-0.030	<b>0.19</b>	0.088	-0.072	<b>-0.254</b>
2. T2 ATV	<b>0.564</b>		<b>0.478</b>	-0.106	<b>0.227</b>	-0.128	-0.040	0.056	-0.053	-0.021	0.156	0.109	<b>-0.181</b>	<b>-0.334</b>
3. T3 ATV	<b>0.524</b>	<b>0.678</b>		-0.071	-0.157	<b>0.264</b>	<b>-0.251</b>	<b>-0.304</b>	0.023	0.101	<b>0.233</b>	0.164	-0.072	<b>-0.257</b>
4. T1 AUT	<b>0.159</b>	0.074	<b>0.149</b>		<b>0.706</b>	<b>0.607</b>	<b>-0.323</b>	<b>-0.243</b>	<b>-0.257</b>	0.12	-0.026	-0.051	-0.025	0.073
5. T2 AUT	-0.024	<b>0.166</b>	<b>0.162</b>	<b>0.682</b>		<b>0.605</b>	<b>-0.216</b>	0.018	<b>-0.264</b>	0.046	0.013	-0.012	-0.137	-0.069
6. T3 AUT	-0.027	-0.006	<b>0.213</b>	<b>0.634</b>	<b>0.699</b>		<b>-0.315</b>	<b>-0.197</b>	-0.074	0.168	0.051	0.05	0.059	0.125
7. T1 PER	0.035	-0.084	-0.141	-0.114	-0.091	-0.031		<b>0.612</b>	<b>0.583</b>	0.123	-0.107	0.064	0.14	<b>0.33</b>
8. T2 PER	-0.099	-0.055	<b>-0.165</b>	-0.062	-0.07	0.037	<b>0.55</b>		<b>0.514</b>	0.043	0.031	0.12	0.092	<b>0.28</b>
9. T3 PER	-0.054	<b>-0.183</b>	-0.101	0.107	-0.067	0.141	<b>0.582</b>	<b>0.707</b>		0.169	-0.069	0.117	0.08	<b>0.259</b>
10. T2 NA	-0.015	<b>-0.153</b>	-0.077	0.115	0.017	0.124	0.133	0.097	<b>0.205</b>		-0.019	<b>0.302</b>	<b>0.187</b>	<b>0.351</b>
11. T2 ORC	0.275	<b>0.161</b>	0.121	0.067	0.05	0.098	-0.107	-0.032	0.053	0.063		<b>0.547</b>	-0.149	<b>-0.183</b>
12. T2 SUR	0.114	-0.032	-0.025	0.144	0.051	0.112	-0.018	0.063	0.077	<b>0.296</b>	<b>0.511</b>		0.154	-0.002
13. T3 EXT	-0.038	-0.023	<b>-0.146</b>	0.067	0.074	0.005	<b>0.237</b>	<b>0.214</b>	<b>0.202</b>	<b>0.166</b>	<b>-0.162</b>	-0.082		<b>0.586</b>
14. T3 INT	<b>-0.156</b>	<b>-0.229</b>	<b>-0.242</b>	0.12	0.071	0.141	<b>0.315</b>	<b>0.344</b>	<b>0.345</b>	<b>0.279</b>	-0.129	-0.028	<b>0.537</b>	

Note. Mothers' correlations below the diagonal, fathers' above the diagonal. T1 = Time 1 - Prenatal; T2 = Time 2 - 6 months; T3 = Time 3 - 18 months; NA = IBQ Negative Affect; ORC = IBQ Orienting/Regulatory Capacity; SUR = IBQ Surgency; EXT = BITSEA Externalizing Problems; INT = BITSEA Internalizing Problems; ATV = PAQ Authoritative; AUT = PAQ Authoritarian; PER = PAQ Permissive. **Bolded** values indicate statistical significance.

**Table 4**

Standardized Coefficients for Mothers' and Fathers' Individual Path Models

Parameter Estimate	Mothers		Fathers	
	$\beta$	$p$	$\beta$	$p$
T1 ATV → T2 ATV	<b>.571</b>	<b>.001</b>	<b>.533</b>	<b>.001</b>
T1 ATV → T3 ATV	<b>.232</b>	<b>.001</b>	<b>.374</b>	<b>.001</b>
T2 ATV → T3 ATV	<b>.568</b>	<b>.001</b>	<b>.310</b>	<b>.003</b>
T1 AUT → T2 AUT	<b>.645</b>	<b>.001</b>	<b>.700</b>	<b>.001</b>
T1 AUT → T3 AUT	<b>.256</b>	<b>.001</b>	<b>.226</b>	<b>.008</b>
T2 AUT → T3 AUT	<b>.483</b>	<b>.001</b>	<b>.480</b>	<b>.001</b>
T1 PER → T2 PER	<b>.476</b>	<b>.001</b>	<b>.564</b>	<b>.001</b>
T1 PER → T3 PER	<b>.269</b>	<b>.001</b>	<b>.444</b>	<b>.001</b>
T2 PER → T3 PER	<b>.580</b>	<b>.001</b>	<b>.316</b>	<b>.004</b>
T1 ATV → T2 Infant NA	.015	.836	.000	1.000
T1 AUT → T2 Infant NA	.075	.254	.164	.102
T1 PER → T2 Infant NA	.080	.324	.087	.392
T1 ATV → T2 Infant ORC	<b>.312</b>	<b>.001</b>	.157	.116
T1 AUT → T2 Infant ORC	-.019	.815	-.025	.830
T1 PER → T2 Infant ORC	<b>-.173</b>	<b>.042</b>	-.009	.938
T1 ATV → T2 Infant SUR	.143	.088	.114	.221
T1 AUT → T2 Infant SUR	.063	.440	.038	.750
T1 PER → T2 Infant SUR	-.105	.217	.092	.375
T2 ATV → T3 Toddler EXT	.049	.554	-.145	.081
T2 AUT → T3 Toddler EXT	.073	.290	-.080	.278
T2 PER → T3 Toddler EXT	<b>.196</b>	<b>.008</b>	.047	.612
T2 ATV → T3 Toddler INT	<b>-.162</b>	<b>.021</b>	<b>-.236</b>	<b>.007</b>
T2 AUT → T3 Toddler INT	<b>.158</b>	<b>.014</b>	-.089	.209
T2 PER → T3 Toddler INT	<b>.346</b>	<b>.001</b>	<b>.140</b>	<b>.038</b>
T2 Infant NA → T3 Toddler EXT	.128	.136	.130	.167
T2 Infant ORC → T3 Toddler EXT	-.123	.129	<b>-.271</b>	<b>.007</b>
T2 Infant SUR → T3 Toddler EXT	-.083	.321	<b>.296</b>	<b>.002</b>
T2 Infant NA → T3 Toddler INT	<b>.226</b>	<b>.007</b>	<b>.346</b>	<b>.001</b>
T2 Infant ORC → T3 Toddler INT	-.041	.579	-.063	.515
T2 Infant SUR → T3 Toddler INT	-.083	.323	-.021	.797
T2 Infant NA → T3 ATV	.059	.349	.092	.218
T2 Infant ORC → T3 ATV	-.017	.808	.077	.470
T2 Infant SUR → T3 ATV	-.031	.678	.017	.810
T2 Infant NA → T3 AUT	.097	.126	.066	.450
T2 Infant ORC → T3 AUT	.056	.399	.026	.803
T2 Infant SUR → T3 AUT	-.020	.790	.073	.356
T2 Infant NA → T3 PER	.086	.135	.052	.544
T2 Infant ORC → T3 PER	<b>.120</b>	<b>.023</b>	-.048	.646

<b>T2 Infant SUR → T3 PER</b>	-.020	.698	.099	.190
<b>T3 Toddler INT ↔ T3 Toddler EXT</b>	<b>.460</b>	<b>.001</b>	<b>.596</b>	<b>.001</b>

*Note.* T1 = Time 1 – Prenatal; T2 = Time 2 – 6 months; T3= Time 3 – 18 months; NA = IBQ Negative Affect; ORC = IBQ Orienting/Regulatory Capacity; SUR = IBQ Surgency; EXT = BITSEA Externalizing Problems; INT = BITSEA Internalizing Problems; ATV = PAQ Authoritative; AUT = PAQ Authoritarian; PER = PAQ Permissive. **Bolded** values indicate statistical significance. All pathways include age and SES as covariates. Other covariances (among temperament and parenting style) are available upon request.



**Table 5**

Standardized Coefficients for Dyadic Path Models by Parenting Style

Parameter Estimate	ATV Model						AUT Model						PER Model								
	Mothers		Fathers		p		Mothers		Fathers		p		Mothers		Fathers		p				
	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p	$\beta$	p			
T1 PS → T2 PS	.556	.001	.189	.048	.652	.001	.693	.001	.457	.001	.556	.001	.457	.001	.556	.001	.457	.001	.556	.001	
T1 PS → T3 PS	.147	.080	.303	.005	.227	.003	.317	.014	.329	.001	.368	.001	.329	.001	.368	.001	.329	.001	.368	.001	
T2 PS → T3 PS	.620	.001	.217	.147	.506	.001	.323	.026	.535	.001	.323	.001	.535	.001	.323	.001	.535	.001	.323	.001	
T1 PS → T2 Infant NA	-.039	.604	-.024	.803	.083	.217	.121	.127	.071	.375	.038	.672	.038	.672	.038	.672	.038	.672	.038	.672	.038
T1 PS → T2 Infant ORC	.219	.001	.189	.048	-.040	.644	-.037	.670	-.111	.223	-.045	.613	-.045	.613	-.045	.613	-.045	.613	-.045	.613	-.045
T1 PS → T2 Infant SUR	.081	.253	.135	.116	.070	.395	-.042	.643	-.038	.659	.085	.300	-.038	.659	.085	.300	-.038	.659	.085	.300	-.038
T2 PS → T3 Toddler EXT	.037	.641	-.211	.012	.034	.620	-.140	.094	.159	.045	.014	.893	.159	.045	.014	.893	.159	.045	.014	.893	.159
T2 PS → T3 Toddler INT	-.114	.114	-.278	.001	.016	.812	-.113	.138	.307	.001	.164	.083	.307	.001	.164	.083	.307	.001	.164	.083	.307
T2 Infant NA → T3 Toddler EXT	.185	.044	.088	.349	.148	.121	.131	.162	.160	.080	.075	.425	.160	.080	.075	.425	.160	.080	.075	.425	.160
T2 Infant ORC → 3 Toddler EXT	-.152	.062	-.251	.012	-.153	.054	-.234	.029	-.138	.089	-.283	.005	-.138	.089	-.283	.005	-.138	.089	-.283	.005	-.138
T2 Infant SUR → T3 Toddler EXT	-.076	.392	.294	.001	-.070	.437	.261	.005	-.086	.318	.287	.001	-.086	.318	.287	.001	-.086	.318	.287	.001	-.086
T2 Infant NA → T3 Toddler INT	.309	.001	.327	.001	.294	.003	.344	.001	.290	.002	.329	.001	.290	.002	.329	.001	.290	.002	.329	.001	.290
T2 Infant ORC → T3 Toddler INT	-.077	.284	-.081	.399	-.090	.243	-.091	.371	-.089	.222	-.091	.357	-.089	.222	-.091	.357	-.089	.222	-.091	.357	-.089
T2 Infant SUR → T3 Toddler INT	-.058	.487	.006	.944	-.045	.610	-.030	.728	-.051	.562	-.032	.706	-.051	.562	-.032	.706	-.051	.562	-.032	.706	-.051
T2 Infant NA → T3 PS	.059	.322	.120	.135	.091	.116	.112	.188	.112	.040	.056	.534	.112	.040	.056	.534	.112	.040	.056	.534	.112
T2 Infant ORC → T3 PS	-.008	.917	.088	.381	.119	.058	.046	.633	.148	.007	-.079	.454	.148	.007	-.079	.454	.148	.007	-.079	.454	.148
T2 Infant SUR → T3 PS	-.063	.378	.009	.914	-.052	.492	.062	.413	-.029	.579	.099	.199	-.029	.579	.099	.199	-.029	.579	.099	.199	-.029
Covariances																					
Mother T1 PS ↔ Father T1 PS	.013	.889			.268	.001			.053	.473											
Mother T2 PS ↔ Father T2 PS	.054	.601			.095	.210			.260	.006											
Mother T3 PS ↔ Father T3 PS	.063	.507			.119	.249			.034	.670											
Mother T2 Infant NA ↔ Father T2 Infant NA	.324	.001			.304	.001			.297	.001											
Mother T2 Infant ORC ↔ Father T2 Infant ORC	.140	.040			.130	.057			.145	.029											
Mother T2 Infant SUR ↔ Father T2 Infant SUR	.236	.002			.221	.003			.222	.003											
Mother T3 Toddler EXT ↔ Father T3 Toddler EXT	.258	.014			.220	.033			.220	.032											

Parameter Estimate	ATV Model		AUT Model		PER Model	
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$
Mother T3 Toddler INT ↔ Father T3 Toddler INT	.186	.051	.193	.040	.198	.031
Mother T3 Toddler INT ↔ Mother T3 Toddler INT	.472	.001	.463	.001	.441	.001
Father T3 Toddler INT ↔ Father T3 Toddler EXT	.585	.001	.593	.001	.606	.001

Note. T1 = Time 1 – Prenatal; T2 = Time 2 – 6 months; T3= Time 3 – 18 months; PS = Parenting Style; NA = IBQ Negative Affect; ORC = IBQ Orienting/Regulatory Capacity; SUR = IBQ Surgency; EXT = BITSEA Externalizing Problems; INT = BITSEA Internalizing Problems; ATV = PAQ Authoritative; AUT = PAQ Authoritarian; PER = PAQ Permissive. **Bolded** values indicate statistical significance. All pathways included parental SES as a covariate. Other covariances (among temperament and parenting style) available upon request.