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Growth in Temperament and Parenting as Predictors of Adjustment During Children's Transition to Adolescence

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Abstract

The author examined relations among demographic risk (income, maternal education, single-parent status), growth in temperament (fear, irritability, effortful control), and parenting (rejection, inconsistent discipline) across 3 years and the prediction of children's adjustment problems in a community sample ($N = 190$; ages 8–12 years at Time 1). Family income was related to higher initial levels of fear, irritability, rejection, and inconsistency and lower effortful control but was not related to changes in these variables. Higher initial rejection predicted increases in child fear and irritability. Higher initial fear predicted decreases in rejection and inconsistency. Higher initial irritability predicted increases in inconsistency, and higher initial effortful control predicted decreases in rejection. When growth of parenting and temperament were considered simultaneously, increases in effortful control and decreases in fear and irritability predicted lower Time 3 internalizing and externalizing problems. Increases in rejection and inconsistent discipline predicted higher Time 3 externalizing, although sometimes the effect appeared to be indirect through temperament. The findings suggest that temperament and parenting predict changes in each other and predict adjustment during the transition to adolescence.

Keywords

demographic risk; temperament; parenting; adjustment problems; early adolescence

Both parenting (Frick, 1994; Loeber & Stouthamer-Loeber, 1986; Maccoby & Martin, 1993) and temperament (Rothbart & Bates, 1998; Sanson, Hemphill, & Smart, 2004) are important predictors of children's adjustment, and their effects are additive, with each contributing unique variance above the other (e.g., Bates, Pettit, Dodge, & Ridge, 1998; Halpern, Garcia Coll, Meyer, & Bendersky, 2001; Rubin, Hastings, Chen, Stewart, & McNichol, 1998; Smith & Prior, 1995). Moreover, transactional models in which parenting and child characteristics are mutually influential have been suggested to explain the development of adjustment problems (e.g., Halpern et al., 2001; Maccoby, 1992; Reiss & Price, 1996; Rothbart & Bates, 1998; Sanson et al., 2004). However, few studies have examined the relations between temperament and parenting during the transition to adolescence using longitudinal, growth analyses. In fact, data on the development of temperament and

parenting during this transitional period are sparse (e.g., Conger, Lorenz, & Wickrama, 2004). This study examines changes in parenting and temperament as predictors of children's adjustment problems during middle childhood and early adolescence.

Temperament is believed to play an important role in children's social and personality development and psychological adjustment (Bates, 1989; Hartup & van Lieshout, 1995; Prior, 1992). It is thought to directly affect children's social, personality, and psychological development and influence or moderate key socialization experiences, such as parent-child relationships and stressful life events (Rothbart, Ahadi, & Evans, 2000; Rothbart & Bates, 1998). There are numerous approaches to conceptualizing temperament. However, temperament is generally defined as the physiological basis for the motivational, affective, and regulation components of personality (Goldsmith et al., 1987). Temperament is characterized as physiologically based, relatively consistent over time, and modifiable by the environment and socialization experiences (Rothbart & Bates, 1998). This study includes dimensions reflecting Rothbart's (1989) theoretical model of temperament, in which temperament is viewed as individual differences in reactivity and self-regulation. Reactivity involves individual differences in the arousal of negative emotions, including fear and frustration (Rothbart, 1989; Rothbart & Bates, 1998). Self-regulation is defined as processes that modulate reactivity, facilitating or inhibiting affective and behavioral responses. Those processes include attention regulation and inhibitory control, which are the primary components of effortful control (Rothbart, Ahadi, Hershey, & Fisher, 2001). Effortful control has been defined as the ability to inhibit a dominant response to produce a nondominant response (Rothbart et al., 2000). There is substantial evidence that negative reactivity and self-regulation contribute to the development of internalizing and externalizing problems (Rothbart & Bates, 1989). In this study, it was hypothesized that changes in child fear, irritability, and effortful control would be related to changes in parenting behaviors and that both would predict children's adjustment problems.

Parental warmth and control are frequently identified as important dimensions of parenting (e.g., Grusec, 1997) and are consistently found to relate to children's externalizing and internalizing problems (e.g., Galambos, Barker, & Almeida, 2003; Loeber & Stouthamer-Loeber, 1986; Maccoby & Martin, 1983; Patterson, Reid, & Dishion, 1992; Rothbaum & Weisz, 1994). Parenting behaviors related to warmth and control have been shown to shape infant and child characteristics, as well (e.g., Eisenberg et al., 1999; Lerner & Galambos, 1985; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). Parent behaviors are related to changes in child negative emotionality. For example, maternal negative emotionality predicted increases in negativity in infants over time (Malatesta & Haviland, 1986), and inconsistently applied reprimands and reinforcement predicted increases in child negative affect (Acker & O'Leary, 1996). Also, complementary, responsive, and sensitive maternal parenting was more common among high-reactive infants who changed to being low in reactivity compared with those who remained high in reactivity (Belsky, Fish, & Isabella, 1991). Parent behaviors have also been linked with self-regulation. Early maternal responsiveness predicted lower child impulsivity (Olson, Bates, & Bayles, 1990) and higher effortful control (Kochanska, Murray, & Harlan, 2000). In a longitudinal study, positive parenting attributes were related to increases in persistence in children from ages 4 to 7

years (Halverson & Deal, 2001). Thus, parenting behaviors may shape child negative emotionality and self-regulation.

However, child characteristics also predict parenting behaviors (Lerner, 1993). For example, studies show that infant and toddler negative affect and difficult temperament predict maternal responsiveness, guidance, control, involvement, social interaction, and conflict interactions (e.g., Bates, Pettit, & Dodge, 1995; Braungart-Rieker, Garwood, & Stifter, 1997; Campbell, 1979; Crockenberg & Acredolo, 1983; Linn & Horowitz, 1983; Maccoby, Snow, & Jacklin, 1984; Malatesta, Grigoryev, Lamb, Albin, & Culver, 1986; van den Boom, 1989). These studies have consistently shown that difficult temperament and negative affect, particularly irritability, are related to less optimal parenting behaviors, such as unresponsiveness, lack of contingent responding, and harsh control. Child fearfulness might operate differently than irritability or difficulty. For example, fearfulness predicts more compliance in toddlers (e.g., Kochanska, Coy, & Murray, 2001; van der Mark, Bakermans-Kranenburg, & van Ijzendoorn, 2002), which may make fearful children easier to discipline. Also, in middle childhood, dispositional internalizing emotions, which included fear and anxiety, were related differently to parent reactions than were dispositional externalizing emotions, which included anger and irritability. Dispositional externalizing emotions were related to parental punitive and minimizing reactions, whereas internalizing emotions were not (Eisenberg et al., 1999). Thus, fear and irritability are examined separately in this study.

Many of the studies reviewed posit a direction of effect between parenting and temperament, with one expected to predict the other. However, the relation between parenting and child behaviors is thought to be bidirectional (Wachs, 1991). Several studies have provided support for bidirectional relations between parenting and temperament, most using samples of infants and young children (e.g., Maccoby et al., 1984; Rubin, Nelson, Hastings, & Asendorpf, 1999; van den Boom, 1989). For example, using cross-lagged panel models, Rubin et al. (1999) demonstrated that shyness in 2-year-olds predicted less encouragement of independence by parents 2 years later, controlling for prior levels of encouragement; whereas parents' encouragement of independence at 2 years did not predict later shyness.

Few studies have examined bidirectional relations between temperament and parenting after early childhood. The transactional relation between parenting and temperament is expected to continue from early childhood into middle childhood and to affect children's psychological adjustment into adolescence. The transition from middle childhood to adolescence is marked for some children by increases in behavioral and emotional problems, such as conduct problems, depression, and substance use (Angold & Rutter, 1992; Costello et al., 1988; Fleming, Offord, & Boyle, 1989). Changes in both children's (Brody & Ge, 2001; Spring, Rosen, & Matheson, 2002) and parents' (e.g., Brody & Ge, 2001; Freeman & Newland, 2002; Holmbeck, Paikoff, & Brooks-Gunn, 1995) behaviors may contribute to the development of adjustment problems during this period. Therefore, it is useful to consider the interrelations of parenting and temperament and their combined contribution to the development of adjustment problems during the transition to adolescence. One study examined a model of mutual influence in middle childhood in which parents' negative reactions to children's negative emotionality and self-regulation were investigated (Eisenberg et al., 1999). Children's dispositional externalizing emotions (anger and

irritability) at 6 – 8 years of age predicted greater parental distress reactions 2 years later, which, in turn, predicted greater child externalizing emotions 2 years after that. Similarly, children's self-regulation at 6 – 8 years of age predicted fewer parental punitive reactions to children's emotions 2 years later, and parents' punitive reactions predicted lower child self-regulation 2 years after that. There was no evidence of cross-lagged associations between dispositional internalizing emotions (fear and anxiety) and parent negative reactions. In another study, parents' harsh and responsive practices and children's self-regulation were examined as predicting each other and adjustment outcomes across 3 years of early adolescence (Brody & Ge, 2001). Children's self-regulation predicted lower levels of harsh-conflicted parenting practices, which, together with self-regulation, predicted poorer psychological functioning. Another study demonstrated support for bidirectional relations of temperament and parenting during middle childhood. Controlling for prior levels of both temperament and parenting, the authors found that child fear predicted increases in maternal acceptance, whereas child irritability predicted increases in inconsistent discipline. Maternal inconsistent discipline predicted increases in both fear and irritability (Lengua & Kovacs, 2005).

Although these studies used analyses that clarified the direction of relations between parenting and temperament, few studies have examined whether changes in parenting and temperament are interrelated and uniquely predict child adjustment. Transactional models of mutual influence between temperament and parenting have been proposed to explain the development of adjustment problems in children (e.g., Halpern et al., 2001; Reiss & Price, 1996). Parenting and temperament may shape each other, promoting more positive qualities or behaviors or exacerbating more negative ones. Child behavior may have an evocative influence on parenting behavior, such that child behaviors elicit specific parent responses (e.g., Ge et al., 1996; Lytton, 1990; Plomin, DeFries, & Loehlin, 1977; Reiss, 1995; Scarr & McCartney, 1983). In turn, parenting behaviors may reinforce, exacerbate, or evoke child behaviors, shaping children's temperamental characteristics. For example, a child's high levels of irritability may engender difficult or negative interactions with his or her parent, who might respond by withdrawing affection. Because the parent-child relationship can play a major role in children's affective expression and regulation (e.g., Eisenberg et al., 1999; Gottman, Katz, & Hooven, 1996), this may lead to greater negative affectivity or poorer self-regulation in the child. Similarly, a parent's inconsistent discipline practices and rejection may be exacerbated by a child's poor effortful control and may also reinforce self-control problems in the child. For example, there is evidence that relationship reciprocity, in which there is a warm, give-and-take relationship between parents and children, encourages compliance in young children (e.g., Hartup & Rubin, 1986; Kochanska, 1995).

Furthermore, most studies have examined the mutual relations of single parenting and temperament dimensions, but few studies have examined multiple parenting and temperament dimensions simultaneously. This is important because specific patterns of relations between particular dimensions of temperament and parenting might emerge. For example, although child irritability consistently predicts more negative parenting behaviors, fear has not been consistently shown to do so and at times has been shown to predict fewer negative parenting behaviors (e.g., Lengua & Kovacs, 2005). Including multiple

temperament and parenting variables in a study might clarify the transactional relation between parents and children and the emergence of adjustment problems.

When examining the relation between parenting behaviors and child adjustment, it is important to take into account demographic variables such as family income level, maternal education, and family structure (single- vs. two-parent households). Low income and poverty, which are more common among single-parent households, have been linked with a host of child adjustment problems (e.g., Anderson, Williams, McGee, & Silva, 1989) and more problematic parenting behaviors (e.g., McLoyd, 1990; Mistry, Vandewater, Huston, & McLoyd, 2002), as has low maternal education (e.g., Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003). Thus, family income, maternal education, and single-parent status were examined in this study.

In sum, although there is evidence supporting bidirectional relations between temperament and parenting, few studies have investigated multiple dimensions of temperament and parenting. In addition, few studies have examined these associations during the transition to adolescence, and none has examined the transactional relations between temperament and parenting using a growth modeling approach. Using 3-year longitudinal data, this study examined the interrelations between changes in parenting and temperament during middle childhood and explored whether changes in temperament and parenting each made unique contributions to child adjustment above the effects of the other. The study included multiple dimensions of temperament (fear, irritability, effortful control) and parenting behaviors (rejection, inconsistent discipline) in an effort to identify specific patterns in the relations among temperament and parenting and the prediction of children's adjustment problems. Demographic variables, including family income, maternal education, and single-parent status, were examined as possible covariates.

On the basis of previous evidence, the following associations were hypothesized: (a) Child irritability was expected to predict increases in inconsistent discipline and rejecting behaviors, which, in turn, were expected to predict increases in irritability. (b) Child fearfulness was expected to predict decreases in parents' rejection, whereas rejection and inconsistent discipline were expected to predict increases in fear. (c) Child effortful control was expected to predict decreases in rejection and inconsistent discipline, and rejection and inconsistent discipline were expected to predict decreases in effortful control. (d) Changes in both temperament and parenting were expected to predict children's internalizing and externalizing problems above the effects of demographic risk factors of low income, low maternal education, and single-parent status.

Method

Participants

This study used a community sample of 190 third- through fifth-grade children and their female primary caregivers. The original sample consisted of 214 participants at Time 1. The study used data from three time points, each separated by approximately 1 year. Only families with complete data at all three time points were included in this study. Ten families were not interviewed at Time 2 but were interviewed at Time 3, 6 families were not

interviewed at Time 3 but were interviewed at Time 2, and 8 families were missing data at both Time 2 and Time 3. Participants were recruited through children's public school classrooms. Schools were selected to represent a variety of sociodemographic characteristics of the urban area surrounding the university. One child in the target grades per family was asked to participate, and if there was more than one child in the target grades in the family, one child was randomly selected to participate. Children with developmental disabilities (except learning disabilities) and families who were not fluent in English were excluded from the study to ensure adequate comprehension of the questionnaires used in this study. A female primary caregiver was required to participate, whereas a male primary caregiver's participation was optional. Only data from the interviews of female caregivers and children were used to retain the majority of the sample for analyses.

Participants with complete data for all three assessments were compared with those missing data from any of the time points. Demographic (maternal education, family income, ethnicity, sex and age of child, single-parent status), Time 1 temperament (fear, irritability, effortful control), parenting (rejection, inconsistent discipline), and adjustment problems (internalizing, externalizing) were compared, for a total of 13 comparisons. The *t* tests indicated that participants missing data ($n = 24$) differed significantly from those missing no data ($n = 190$) on mother's level of education (missing, $M = 6.08$, $SD = 1.86$; no missing, $M = 7.07$, $SD = 1.69$), $t(212) = 2.67$, $p < .01$, and on family income (missing, $M = 4.83$, $SD = 3.00$; no missing, $M = 6.88$, $SD = 3.14$), $t(212) = 3.01$, $p < .01$. In addition, retention in the sample was highest for Caucasian and European American families (94%) compared with African American (79%), Asian American (86%), Latino or Hispanic (89%), and Native American (60%) families and families with other or multiple ethnic/racial backgrounds (86%), $\chi^2(22, N = 214) = 42.90$, $p < .01$. Taken together, these differences suggest that some bias may be introduced into the results by missing data. Family income, maternal education, and single-parent status were controlled in the analyses.

At Time 1, children's mean age was 9.48 years ($SD = 1.01$, range = 8–12). The sample included 16% African American children, 3% Asian American children, 70% European American children, 4% Latino or Hispanic children, 2% Native American children, and 5% children with multiple ethnic or racial backgrounds. Fifty-five percent of the children were female. Ninety-five percent of the female primary caregivers were biological mothers, 3% were adoptive mothers, and 2% were grandmothers. Seventy-one percent of the families consisted of two-parent households, and 29% were single-parent households. Annual family income was distributed roughly evenly across sextiles of income: 9% less than \$20,000, 19% \$21,000 to \$40,000, 17% \$41,000 to \$60,000, 17% \$61,000 to \$80,000, 20% \$81,000 to \$100,000, and 16% over \$100,000. The sample included mothers who were well educated, with the modal level of educational attainment being college or university graduate. Five percent of the mothers had completed some high school or were high school graduates, 28% had some college or technical/professional school training, 32% had graduated from college, 28% had attended some graduate school or achieved a master's degree, and 7% had doctorate-level training.

The sample represented a range of children's adjustment problems at Time 1, with rates of clinical levels of problems consistent with those expected in a community sample.

According to a clinical cutoff of 18 on the Child Depression Inventory (CDI; Kovacs, 1981), 4% of the sample met criteria for depression. With a cutoff of 14 to detect borderline levels, 8% reported borderline levels of depression. With an 0.5 standard deviation cutoff, commonly used to identify elevated levels of symptomatology in community samples (e.g., Capaldi, 1991; Miller-Johnson et al., 1998), 23% of the sample demonstrated elevated levels of depression. According to the Child Behavior Checklist's (Achenbach, 1991a) clinical and borderline cutoffs for boys and girls, 4% and 8% of the sample met criteria for clinical and borderline levels of externalizing problems, respectively. With an 0.5 standard deviation cutoff, 25% of the sample demonstrated elevated levels of externalizing problems.

Procedures

Data were collected via highly structured, scripted 2.5-hr interviews and structured tasks that were conducted in the families' home. After confidentiality was explained, mothers signed informed consent forms, and children signed assent forms. The assent forms indicated that children's responses would not be shared with their mother unless there was concern about child safety (i.e., high level of depression, suicidal ideation, or child abuse). Mothers and children were interviewed by separate, trained interviewers in separate rooms (when possible) to ensure the privacy of their responses. Questionnaire measures were administered during the structured interviews, with interviewers reading scripted instructions and all items on the questionnaires to the participants to minimize errors in interpretation and address potential problems with literacy in both parents and children. Families were scheduled for their second and third assessments approximately 1 ($M = 1.04$, $SD = 0.11$) and 2 ($M = 2.00$, $SD = 0.15$) years, respectively, after their first assessment. Families received \$40 (\$50 if 2 parents participated) compensation for participating at Time 1, and compensation increased by \$10 each year the families participated.

Measures

Descriptive statistics for all measures used in the study are presented in Table 1.

Temperament—Both mothers and children reported on children's temperament using the Fear (6 items), Irritability (8 items), and Attention Regulation (8 items) subscales of the Early Adolescent Temperament Questionnaire (Capaldi & Rothbart, 1992) and the Inhibitory Control (12 items) subscale of the Child Behavior Questionnaire (Rothbart et al., 2001). Effortful control consisted of the combined Attention Regulation and Inhibitory Control subscales. Respondents rated each item on a 5-point Likert scale (1 = *very false* to 5 = *very true*). Subscale internal consistency reliabilities ranging from .65 to .79 have been reported for these measures. Multimethod measures of the temperament and adjustment constructs were sought to address the effects of shared method variance and reporter bias. A confirmatory factor analysis (CFA) was conducted to assess the feasibility of combining reports. A multitrait, multimethod model with correlated uniquenesses (i.e., estimated error covariances) within method (mother report, child report) was used (Marsh, Byrne, & Craven, 1992). A model was specified in which fear loaded on mother and child reports of fear, irritability loaded on mother and child reports of irritability, and effortful control loaded on mother and child reports of effortful control. Error covariances within reporter were estimated (one error covariance was constrained to provide one degree of freedom to

allow fit indexes to be estimated). The CFA, based on the covariance matrix and using maximum likelihood estimation, demonstrated an adequate fit to the data, $\chi^2(1, N = 190) = 3.44$, *ns* (comparative fit index = .99), with all estimated factor loadings being significant. The lowest loading was for mother report of fear (.18), and the average magnitude of the loadings was .46. These results suggested that it was feasible to combine reports of temperament.

Mother and child reports were combined by averaging the mother and child report scale scores. Internal consistency reliabilities, measured by alpha, for mother and child reports of fear were .53 and .61, respectively, and the composite alpha (calculated to take into account the alpha and variance for each contributing scale as well as the covariance between the scales) for the measure combined across reporters was .69. Alphas for mother and child reports of irritability were .74 and .72, respectively, and the composite alpha for the measure combined across reporters was .75. Alphas for mother and child reports of effortful control were .86 and .74, respectively, and the composite alpha for the effortful control measure combined across reporters was .85.

Parenting—Parenting behaviors were assessed via mother and child reports on the Rejection (eight items) and Inconsistent Discipline (eight items) subscales of the Child Report of Parenting Behavior Inventory (Schaefer, 1965; Teleki, Powell, & Doddler, 1982). This inventory was originally developed as a child report measure of children's perception of their parents' behaviors. The items were reworded for mother report. Participants respond using a 5-point scale to indicate whether each item was *never*, *rarely*, *sometimes*, *often*, or *always* true of the mother.

As with the measures of temperament, CFA was used to assess the feasibility of combining mother and child reports of parenting. A two-factor model was specified in which a rejection factor consisted of mother and child reports of rejection and an inconsistent discipline factor included mother and child reports of inconsistent discipline. Error covariances within reporter were estimated. However, because this is an underidentified model, it was necessary to set one loading to 1.00. The loading of child reports of rejection on the rejection factor was arbitrarily selected. The fit of the CFA model, based on the covariance matrix and using maximum likelihood estimation, could not be estimated because this was a saturated model (zero degrees of freedom). All estimated factor loadings were significant. The lowest factor loading was for mother reports of inconsistent discipline (.20), and the average factor loading was .69. These results suggest that combining mother and child reports of parenting was feasible. In this study, alphas for mother and child report of rejection were .67 and .82, respectively, and the composite alpha for the measure combined across reporters was .81. Alphas for mother and child reports of inconsistent discipline were .87 and .76, respectively, and the composite alpha for the Inconsistent Discipline subscale combined across reporters was .84.

Child adjustment—Both mother and child reports of adjustment problems were obtained and combined to create cross-reporter measures at Time 3. Mothers reported on children's internalizing and externalizing problems using the Child Behavior Checklist (Achenbach, 1991a) rating items on a 3-point scale (0 = *not true* to 2 = *very/often true*). The alphas for

internalizing and externalizing problems for the present sample were .82 and .81, respectively. Children also reported on their own externalizing and internalizing problems. Child reports of externalizing problems were assessed via the raw scores from the Delinquent and Aggressive Behavior subscales (28 items) of the Youth Self-Report (YSR; Achenbach, 1991b). Although the YSR was developed for children slightly older than many of the children participating in this study, the Delinquent and Aggressive Behavior subscales have demonstrated acceptable reliability and validity with this age group (e.g., Lengua, Wolchik, Sandler, & West, 2000; Sandler, Tein, & West, 1994). The alpha for the child report externalizing scale was .84 in this study. Because many of the children fell outside the recommended age for the YSR, the full measure was not administered. Rather, measures of internalizing problems developed for this age group were administered.

Depression was assessed via the 27-item Child Depression Inventory (CDI; Kovacs, 1981). For each item, children select one of three statements of increasing severity to reflect their level of depressive symptomatology. Alphas for the scale have ranged from .71 (Kovacs, 1981) to .94 (Saylor, Finch, Spirito, & Bennett, 1984). The alpha for the current sample was .82. Children reported on their anxiety on the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978). The RCMAS consists of 28 items (9 Lie scale items) to which the child responds "yes" or "no" and assesses both the degree and the quality of anxiety experienced by children and adolescents from ages 6 to 19. Internal consistency reliability in the present study was .85. Scores on the CDI and RCMAS were correlated .66. The scores were rescaled to have equivalent ranges and combined by summing the two scores to create a child report internalizing problems score. This retained a meaningful variance for the outcome measures, as opposed to standardizing both measures, which is desirable for covariance-based analyses. The internalizing problems measure had an internal consistency reliability of .90.

A CFA was conducted to assess the feasibility of combining reports of adjustment. A model was specified in which internalizing problems loaded on mother reports of internalizing problems and child reports of depression and anxiety and in which externalizing problems loaded on mother and child reports of externalizing problems. Error covariances within reporter were estimated (with one constrained to provide one degree of freedom in the model). The CFA, based on the covariance matrix and using maximum likelihood estimation, demonstrated an adequate fit to the data, $\chi^2(1, N = 190) = 2.14$, *ns* (comparative fit index = .99); all estimated factor loadings were significant. The lowest loading was for mother reports of internalizing problems (.22), and the average magnitude of the loadings was .58. The composite alphas for the combined mother and child report measures of internalizing and externalizing problems were both .88, and scores were the average of mother and child reports.

Results

Overview of Analyses

First, the correlations among demographic variables, temperament, parenting, and adjustment were examined across the 3 years of the study. Second, latent growth curve modeling was used to determine whether each of the temperament and parenting variables

demonstrated growth and variability in growth parameters. Third, the relations of family income, maternal education, and single-parent status to temperament and parenting growth parameters were examined. Fourth, conditional growth models were tested that examined the relation between growth in temperament and parenting and their prediction of adjustment problems after demographic risk was controlled. Fifth, these growth models were tested for consistency across children's age and sex.

Correlations Among Study Variables

The correlations among demographic, temperament, parenting, and adjustment variables across the 3 years of the study are presented in Tables 2 and 3. Time 1 family income, maternal education, and single-parent status were examined as potential covariates of growth in temperament and parenting and as predictors of child adjustment problems. Family income, maternal education, and single-parent status were moderately intercorrelated, and each was modestly related to temperament and parenting at all time points. They were also modestly related to Time 3 internalizing and externalizing problems.

Both temperament and parenting demonstrated moderate levels of stability across the 3 years of the study. Irritability was moderately, positively correlated with maternal rejection and inconsistency, whereas effortful control was moderately, negatively correlated with both parenting dimensions. Fear demonstrated modest to moderate contemporaneous correlations with rejection and inconsistency but was not significantly related to parenting longitudinally. Time 1 and Time 2 temperament and parenting demonstrated modestly to moderately significant correlations with Time 3 adjustment, indicating that both temperament and parenting were plausible predictors of later adjustment problems.

Tests of Growth in Temperament and Parenting

Given the moderate stability in the temperament and parenting variables, it was important to demonstrate whether there were significant changes in the variables over time. Latent growth curve models were used to examine growth in the temperament and parenting variables. Using maximum likelihood estimation in LISREL (Joreskog & Sorbom, 1993) and the matrix of first and second moments (i.e., means and covariances), models were specified in which factor loadings were set to define the intercept as levels of the variable at the first time point and the slope as indicating linear change in the variable across the 3 years of the study. These unconditional models were tested for each of the temperament and parenting dimensions (see Table 4). All of the models demonstrated adequate fit to the data. Initial levels of all of the variables were significantly different from zero, and variances for the intercepts were significant for all variables, indicating significant individual differences in initial levels on all the variables. The slope estimates for fear, irritability, rejection, and inconsistency were significant and negative, indicating that the average slopes decreased across the 3 years of the study. The slope estimate for effortful control was significant and positive, indicating that the average slope increased over time. Variances for the slopes of effortful control and rejection were significant, suggesting significant individual variation in the slopes of those variables.

Demographic Variables as Predictors of Temperament and Parenting Growth Factors

The relations of family income, maternal education, and single-parent status to initial levels of and growth in temperament and parenting were examined (Table 5). Higher family income was related significantly but modestly to lower initial levels of fear, irritability, rejection, and inconsistent discipline and higher levels of effortful control. Higher maternal education was related modestly to lower child irritability. Single-parent status was related modestly to higher irritability and inconsistency and lower effortful control. None of the demographic variables was related to the slope factors of temperament or parenting. Given the moderate correlations among the demographic variables, their effects on the intercepts and slopes of temperament and parenting were tested simultaneously to identify variables that made unique contributions to the intercepts above the effects of the others. Five models, one for each temperament and parenting variable, were tested in which the intercept and slope factors of the temperament or parenting variable were conditioned on family income, maternal education, and single-parent status simultaneously. Only the effects of income on parenting remained significant in those analyses. Thus, only income demonstrated a unique significant effect above the other demographic variables, and the effect was significant only for rejection and inconsistent discipline. Therefore, all subsequent analyses were conducted, controlling for the effects of income.

Growth in Temperament and Parenting as Predictors of Adjustment Problems

Next, models were tested examining the relations between growth in each temperament dimension and growth in each parenting dimension (see Figure 1). The intercept of each temperament and parenting dimension was examined as a predictor of the slope of the other to provide an indication of the direction of effect between temperament and parenting. In addition, the slopes of each of the temperament and parenting dimensions were tested as predictors of children's adjustment problems and positive adjustment at Time 3 (see Table 6). In all analyses, family income was controlled by estimating the direct path of family income to temperament and parenting intercept and slope factors and to internalizing and externalizing problems. The effects of income on adjustment problems depended on the temperament and parenting variables in the model, varying slightly in magnitude. However, in no instance was the relation between income and adjustment problems significant after the initial levels and changes in parenting and temperament were accounted for.

Initial levels of fear were related to higher initial levels of both rejection and inconsistency. Higher initial levels of fear predicted modest decreases in rejection and inconsistency over time. Higher initial levels of rejection predicted modest increases in fear, whereas higher initial levels of inconsistent discipline predicted modest decreases in fear. Initial levels of irritability were related positively to initial levels of rejection and inconsistent discipline. Higher initial rejection predicted modest increases in irritability, but initial levels of irritability did not predict changes in rejection. Conversely, higher initial irritability predicted modest increases in inconsistency, whereas initial levels of inconsistency did not predict changes in irritability. Initial levels of effortful control were related negatively to initial levels of both rejection and inconsistent discipline, and higher initial effortful control predicted moderate decreases in rejection. Initial levels of effortful control did not predict

changes in inconsistency, nor did initial levels of parental rejection or inconsistency predict changes in effortful control.

The slopes of each temperament and parenting dimension were tested for their simultaneous prediction of child adjustment. Increases in fear were strongly related to higher levels of internalizing problems and moderately related to higher levels of externalizing problems above the effects of parenting. When tested with growth in fear, increases in both rejection and inconsistency were moderately related to higher levels of externalizing problems, but neither was related to internalizing problems.

Increases in irritability were related to modestly higher levels of internalizing problems above the effects of parenting. Increases in irritability were moderately related to greater externalizing problems when tested together with rejection but not with inconsistent discipline. That is, the effect of growth in irritability on externalizing problems was not significant when inconsistent discipline was accounted for. When tested with irritability in the models, increases in inconsistency predicted modestly higher externalizing but not internalizing problems, and growth in rejection was not related to adjustment problems.

Increases in effortful control were moderately related to lower levels of Time 3 internalizing and externalizing problems above the effects of rejection, but the effects were more modest when parental inconsistency was taken into account. Increases in rejection moderately predicted higher levels of internalizing problems and strongly predicted higher levels of externalizing problems above the effects of effortful control. Increases in inconsistent discipline were modestly related to higher externalizing but not internalizing problems.

Tests of Consistency of Models Across Age and Sex

The models of growth in temperament and parenting predicting adjustment and controlling for income were tested for consistency across children's age and sex. Researchers have recommended sequential tests based on hierarchy of theoretical importance regarding the parameters (Alwin & Jackson, 1981). Hypotheses of invariance across groups of the covariance structure, structural matrix, and variance–covariance matrices of endogenous variables, as well as residuals, were sequentially tested.

Children's age—The variance–covariance matrices for model variables were tested for invariance across age groups via Box's M test, which provides a sensitive test of differences across covariance matrices. The children who were 8 and 9 years old at Time 1 of the study ($n = 108$) were compared with those who were 10 to 12 years old at Time 1 ($n = 82$), which yielded significant differences between the covariance matrices for the two groups for the models including child irritability—with rejection (Box's $M = 68.77$), $F(45, 95227) = 1.45$, $p < .05$; with inconsistency (Box's $M = 74.43$), $F(45, 95227) = 1.57$, $p < .01$ —and effortful control—with rejection (Box's $M = 72.07$), $F(45, 95227) = 1.52$, $p < .01$; with inconsistency (Box's $M = 71.83$), $F(45, 95227) = 1.51$, $p < .05$. The covariance matrices for models including fear yielded no significant differences between the two groups. Given that the omnibus tests detected differences in the covariance matrices including irritability and effortful control, those models were probed with sequential tests to identify the source of the differences.

Cross-group (or stacked) models in structural equation modeling were used to test for differences in the structural components of the model (i.e., predictive paths among the factors). The cross-group models in which all parameters were free to differ across groups were compared with the identical models in which the beta matrix (or structural components) was constrained to be invariant across the groups. For models including irritability, these tests yielded no significant differences. Next, the models were tested for invariance across the variance–covariance matrices among the endogenous variables, which yielded significant differences. For the models that included irritability with rejection, $\chi^2(21, N = 190) = 33.65, p < .05$, and inconsistency, $\chi^2(21, N = 190) = 37.09, p < .05$, significant differences across age group were accounted for by the variance of depression, which was 30.88 for younger children and 18.74 for older children.

For the models that included effortful control, differences across age group were accounted for by differences in the beta matrix: with rejection, $\chi^2(10, N = 190) = 21.36, p < .05$; with inconsistency, $\chi^2(10, N = 190) = 18.71, p < .05$. In particular, the relation between family income and effortful control differed across age group. For younger children, family income was significantly related to initial levels of effortful control ($\beta = .44, SE = .09; z = 4.65, p < .01$), whereas for older children, income did not significantly predict initial levels of effortful control ($\beta = .02, SE = .11; z = 0.17, ns$).

Children's sex—When girls ($n = 104$) were compared with boys ($n = 86$), the Box's M tests were significant for all of the models' covariance matrices. Given that the omnibus tests detected differences in the variance–covariance matrices, all models were probed further. In all of the models that included parental rejection, differences across sex were accounted for by differences in the variance–covariance matrix of endogenous variables. In particular, the variance of externalizing problems differed across sex such that the variance was greater for boys (11.49) compared with girls (5.41). In all of the models that included inconsistent discipline (except for the model examining irritability and inconsistent discipline), differences across sex were accounted for by differences in the variance of the slope of inconsistent discipline, such that there was more variability in the slope of inconsistent discipline for boys (0.49) compared with girls (0.11). In the model including irritability and inconsistent discipline, differences across sex were accounted for by both the difference in the variance of externalizing problems and the difference in the variance of the slope of inconsistency.

Discussion

In this study, the relations among changes in multiple temperament and parenting dimensions were examined and tested as predictors of child adjustment. Initial levels of temperament and parenting were shown to predict changes in each other, suggesting a transactional relation between them. Changes in both temperament and parenting also predicted children's adjustment problems. The findings point to a complex interplay between temperament and parenting that appears to be relevant to children's emotional and behavioral development (Sanson et al., 2004).

The children in this study were transitioning from middle childhood to adolescence, a period of marked changes in children's family and social lives (e.g., Holmbeck et al., 1995). During this transition, there are typically decreases in the amount of time parents and children spend together (Larson, Richards, Moneta, & Holmbeck, 1996) and in level of parental control, as individuation is a key developmental issue for these children (Freeman & Newland, 2002). However, evidence suggests that parents remain responsive and connected to their children (Freeman & Newland, 2002; Larson et al., 1996). It is notable that there has been little previous investigation of changes in children's temperament during middle childhood and into adolescence, and this study makes an important contribution in describing those changes in a typically developing sample. There were decreases in fear and irritability and increases in effortful control across the 3 years of the study. Overall, there were few age differences in the sample, other than differences in the variance of internalizing problems, which indicates that the processes examined are similar for children in the range from middle childhood to early adolescence. Similarly, there were few sex differences observed other than greater variability in externalizing problems for boys than girls and greater variability in changes in inconsistent discipline for boys than girls.

Demographic risk factors, particularly family income, were modestly related to both temperament and parenting, with higher risk (low income, low maternal education, single-parent status) being related to higher fear, irritability, rejection, and inconsistent discipline and lower effortful control. It is interesting that demographic risk was related to the level of each of these variables but not to changes in any of the variables. Although the relations among demographic risk factors, such as family income and maternal education, and parenting behaviors are well established (e.g., Gottfried et al., 2003; McLoyd, 1990; Mistry et al., 2002), few studies have examined demographic risk and temperament. The findings of the present study are consistent with the findings of previous research suggesting that low income and poverty are related to higher negative emotionality (Lengua, 2002) and lower self-regulation (Eisenberg et al., 2001; Miech, Essex, & Goldsmith, 2001). These findings also suggest that income relates to effortful control for younger but not older children, similar to the suggestion that the impact of socioeconomic status is temporarily equalized during adolescence (Lupien, King, Meaney, & McEwen, 2001). Also notable is the finding that there were independent effects of income on parenting but not temperament. This might suggest that during early and middle childhood, the effects of low income and other demographic risk factors on child temperament are mediated through parenting, a possibility that should be tested in the future.

Tests of bidirectional relations between temperament and parenting provide evidence of the potential mechanisms of effects of temperament and parenting on each other and on child adjustment. Initial levels of temperament and parenting were correlated. Higher levels of child fear and irritability and lower levels of effortful control were related to higher initial levels of rejection and inconsistent discipline. These relations are consistent with the findings of previous studies that demonstrated relations between temperament and parenting (e.g., Bates et al., 1995; Belsky et al., 1991; Halverson & Deal, 2001; Kochanska et al., 2000; Malatesta & Haviland, 1986).

However, when the mutual prediction of changes in temperament and parenting was examined, a more specific pattern emerged, and each temperament variable had a distinct pattern of relations with parenting. It is important to note that, given moderate levels of stability in the temperament and parenting variables, they predicted relatively modest changes in each other. Fearfulness in children was related to decreases in both rejection and inconsistent discipline, whereas irritability predicted increases in inconsistent discipline. These results are consistent with previous findings that fear and irritability relate differently to parenting (Eisenberg et al., 1999; van der Mark et al., 2002). Child fearfulness appears to engender fewer negative parenting behaviors (e.g., Lengua & Kovacs, 2005), which might reflect parents' efforts to protect or soothe their fearful children (e.g., Rubin et al., 1999). Also, fearful children may not be challenging to manage behaviorally. Irritability is consistently shown to predict increases in negative parenting behaviors (e.g., Acker & O'Leary, 1996; Braungart-Rieker et al., 1997; Maccoby et al., 1984; van den Boom, 1989), although the expectation that irritability would predict increases in rejecting behaviors has not been supported. Children who are irritable are likely to be more difficult to manage. High levels of child irritability might increase parental frustration with efforts to discipline or enforce limits, and parents, in turn, may give in to temporarily relieve their frustration.

Effortful control predicted moderate decreases in rejection, but it was not related to inconsistent discipline, contrary to expectation. This finding is similar to that of a previous study in which children's self-regulation predicted lower levels of harsh-conflicted parenting practices, which, together with self-regulation, predicted poorer psychological functioning (Brody & Ge, 2001). Children with good self-regulation may engage in fewer negative, conflictual interactions with their parents, possibly decreasing parents' negative feelings and behaviors toward them. Few studies have examined effortful control as a predictor of parenting, and these findings should be replicated.

Parenting behaviors predicted modest changes in child temperament, as well. Maternal rejection predicted increases in both fear and irritability, extending similar previous findings (e.g., Lengua & Kovacs, 2005). It is interesting that inconsistent discipline predicted decreases in child fearfulness, contrary to the increases expected *a priori*. It is possible that high consistency of parental control might be perceived as overcontrol by children in this developmental period, which might result in increases in child fear or distress. It would be interesting to examine the relations between child fear and parents' encouragement of autonomy or intrusiveness to illuminate this pattern. Initial levels of parenting did not predict changes in effortful control, which is surprising given evidence of the role of parenting in the development of effortful control in younger children (e.g., Kochanska et al., 2000). Parenting may be of decreasing relevance to children's development of effortful control as they get older. It is surprising that inconsistent discipline was unrelated to changes in irritability or effortful control. Again, one may better understand the role of inconsistent discipline in this age group by considering additional aspects of parenting not examined in this study, such as encouragement of autonomy, responsiveness to negative affect, monitoring, and harsh discipline. In general, these findings suggest that child temperament and parenting behaviors may shape each other over time, but the effects are distinct for different aspects of temperament.

Both temperament and parenting predicted internalizing and externalizing problems. All of the temperament and parenting dimensions measured at Time 1 and Time 2 demonstrated significant associations with adjustment problems at Time 3, indicating that levels of temperament and parenting predicted subsequent adjustment problems. Furthermore, changes in both temperament and parenting predicted children's adjustment problems, although the variables that emerged as significant depended on the variables included in the model. Increases in fear predicted both internalizing and externalizing problems above the effects of parenting but accounted for notably more variance in internalizing problems. Thus, child fearfulness was an important contributor to internalizing problems. Fearfulness might relate to externalizing problems, as fearful children might engage in more oppositional behaviors (Foley, Pickles, Maes, Silberg, & Eaves, 2004), or this association might reflect the moderate degree of co-occurrence of internalizing and externalizing problems. When growth in fear was controlled, growth in maternal rejection and inconsistent discipline predicted externalizing problems but not internalizing problems, which is probably because a larger portion of variance in internalizing problems was accounted for by child fearfulness. However, the effects of maternal rejection on internalizing problems appear to be indirect through its effect on increasing child fear or distress.

Increases in irritability also predicted both internalizing and externalizing problems. Irritability is a symptom that is common to both internalizing and externalizing problems in children. Heightened irritability might impede the internalization of rules, disrupt social interactions, or result in acting out behaviors, which might increase the likelihood of both externalizing and internalizing problems developing (Frick & Morris, 2004). After irritability was controlled, the effect of maternal rejection on adjustment became nonsignificant. However, maternal rejection predicted increases in irritability and therefore may have an indirect effect on adjustment through increasing children's irritability. When increases in inconsistent discipline were examined with irritability, increases in irritability no longer predicted externalizing problems, although they continued to predict internalizing problems. Thus, child irritability predicted increases in inconsistent discipline, which, in turn, predicted externalizing problems; thus, it appears that inconsistent discipline was the operative variable in predicting externalizing problems.

Increases in effortful control predicted moderately lower levels of both internalizing and externalizing problems, consistent with previous studies that showed that higher levels of effortful control predicted lower levels of adjustment problems (e.g., Lengua, 2003). When effortful control was accounted for, increases in rejection predicted both internalizing and externalizing problems, whereas inconsistent discipline predicted only externalizing problems. Thus, effortful control predicted decreases in rejection, which, together with effortful control, predicted lower adjustment problems. The effects of effortful control and inconsistent discipline on adjustment appeared to be relatively independent of each other. Across the models, the effects of increases in inconsistent discipline on higher levels of externalizing problems are notable, consistent with extensive previous evidence of this association (e.g., Chamberlain & Patterson, 1995).

Overall, the results suggest that both temperament and parenting contribute to child adjustment problems and that changes in both account for child outcomes. However, the extent to which parenting relates directly to child adjustment problems appears to depend on which child characteristic is being accounted for. In some cases, the effects of parenting appear to operate indirectly through their effects on child temperament. For example, the results suggest that maternal rejection predicts increases in child fear and irritability, which account for the relation between rejection and adjustment problems. In other cases, for the relation of inconsistent discipline to externalizing problems in particular, the effects of parenting appeared to be direct and independent of the child characteristic considered.

A limitation of this study is that only questionnaire measures of temperament and parenting were consistently collected across the 3 years of the study. Therefore, all variables were assessed with questionnaire measures, and limitations of questionnaire measures include the effects of reporter bias and judgments based on non-objective criteria. The inclusion of multiple assessment methods, such as behavioral or physiological measures, would result in greater confidence in the pattern of findings. However, Rothbart and Bates (1998) concluded that questionnaire measures of temperament provide useful information, including perspective on the construct across time and contexts, and the same could be said for measures of parenting. Also, in this study both mother and child reports on all questionnaire measures were obtained and combined to reduce the likelihood that the results reflect reporter bias or that the pattern of findings was determined by reporter characteristics. Another limitation is that some bias might have been introduced into the results given that sample retention was better for families with higher income and higher maternal education and for European American families. Therefore, the findings should be replicated with nationally representative and high-risk samples to determine the generalizability of these findings to other populations.

The models tested indicate that levels of temperament and parenting predict changes in each other over time, suggesting a bidirectional relation between parenting and temperament. In turn, changes in parenting and temperament account for adjustment outcomes in children. The findings support a transactional relation between temperament and parenting (e.g., Halpern et al., 2001; Reiss & Price, 1996) in which parenting behaviors and child characteristics shape each other, reducing or exacerbating negative qualities. This transactional relation contributes to child adjustment problems, as well. These child characteristics and parent behaviors reflect potential targets of intervention. Parenting interventions aimed at enhancing positive parenting behaviors and encouraging levels of control that are appropriate for this age group might help reduce child fear and irritability. In addition, child-focused interventions that provide anger management and problem-solving skills and enhance effortful control might improve parent-child relationships. Both might reduce problems and promote adaptive outcomes in children (Sanson et al., 2004).

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Figure 1.

Latent growth model of the bidirectional relation between temperament and parenting conditioned on family income and predicting adjustment problems. T = Time. Numbers along the arrows indicate factor loadings set to estimate the growth models.

Table 1

Descriptive Statistics for Predictor and Outcome Variables at All Time Points

Variable	<i>M</i>	<i>SD</i>	Range	Skew
Time 1				
Fear	18.61	3.14	11.00–27.50	0.12
Irritability	26.08	3.91	17.50–37.00	0.09
Effortful control	35.36	3.92	22.75–44.00	–0.34
Rejection	8.14	3.51	1.00–19.00	0.54
Inconsistent discipline	8.93	4.18	1.00–24.50	0.63
Time 2				
Fear	17.55	3.33	10.50–27.00	0.36
Irritability	24.52	3.99	15.00–38.50	0.37
Effortful control	35.86	4.19	25.00–46.25	–0.25
Rejection	7.42	3.18	1.00–18.00	0.48
Inconsistent discipline	7.49	3.85	0.00–21.00	0.74
Time 3				
Fear	16.75	3.20	10.00–27.00	0.43
Irritability	24.06	4.09	15.00–37.00	0.47
Effortful control	36.47	4.22	24.50–45.75	–0.42
Rejection	6.89	3.02	0.50–16.00	0.62
Inconsistent discipline	6.68	4.31	0.00–24.00	0.84
Internalizing	16.33	5.05	9.50–37.00	1.62
Externalizing	3.73	3.23	0.00–18.50	1.73

Table 2

Correlations Among Time 1 and Time 2 Variables

Variable	Time 1							Time 2					
	1	2	3	4	5	6	7	8	9	10	11	12	13
Time 1													
1. Family income	—	.45**	-.62**	-.13	-.24**	.21**	-.18*	-.20**	-.22**	-.21**	.22**	-.23**	-.30**
2. Maternal education		—	-.34**	-.08	-.14*	.12	-.05	-.12	-.11	-.16*	.17*	-.03	-.16*
3. Single-parent status			—	.11	.19**	-.22**	.16*	.16*	.16*	.18*	-.24**	.22**	.24**
4. Fear				—	.46**	-.22**	.16*	.19*	.47**	.18*	-.19**	.10	.09
5. Irritability					—	-.41**	.30**	.31**	.22**	.56**	-.28**	.26**	.24**
6. Effortful control						—	-.40**	-.37**	-.13	-.30**	.73**	-.41**	-.43**
7. Rejection							—	.57**	.19**	.31**	-.32**	.57**	.45**
8. Inconsistent discipline								—	.10	.15*	-.25**	.29**	.65**
Time 2													
9. Fear									—	.43**	-.22**	.26**	.17*
10. Irritability										—	-.44**	.39**	.30**
11. Effortful control											—	-.46**	-.34**
12. Rejection												—	.54**
13. Inconsistent discipline													—

*
 $p < .05$.**
 $p < .01$, two-tailed.

Table 3

Correlations of Time 3 Temperament, Parenting, and Adjustment With Demographics and Time 1 and Time 2 Temperament and Parenting

Variable	Time 1 demographics				Time 1 temperament and parenting				Time 2 temperament and parenting			
	Income	Education	Single-parent status	Fear	Irritability	Effortful control	Rejection	Inconsistent discipline	Fear	Irritability	Effortful control	Inconsistent discipline
Temperament												
Fear	-.22**	-.14*	.16*	.55**	.24**	-.11	.13	.13	.65**	.33**	-.19**	.10
Irritability	-.26**	-.20**	.17*	.30**	.60**	-.38**	.36**	.28**	.40**	.72**	-.44**	.37**
Effortful control	.25**	.17*	-.28**	-.15*	-.29**	.68**	-.33**	-.28**	-.15*	-.37**	.80**	-.44**
Parenting												
Rejection	-.15*	-.03	.13	.07	.21**	-.29**	.39**	.20**	.07	.27**	-.39**	.66**
Inconsistent discipline	-.28**	-.18*	.25**	.09	.15*	-.30**	.26**	.59**	.06	.16*	-.30**	.39**
Adjustment												
Internalizing	-.26**	-.19**	.19**	.17*	.19**	-.38**	.25**	.14*	.31**	.42**	-.50**	.40**
Externalizing	-.23**	-.24**	.20**	.06	.26	-.45**	.20**	.24**	-.00	.34**	-.51**	.44**

* $p < .05$.
** $p < .01$, two-tailed.

Table 4
Parameters From Growth Models Testing Linear Growth in the Temperament and Parenting Variables

Variable	Model fit			Intercept factor			Slope factor		
	$\chi^2(1)$	CFI	M	z	Var.	z var.	Slope	z slope	Var.
Temperament									
Fear	0.45	.95	18.56 (0.21)	86.33**	4.28 (1.22)	3.51**	-0.92 (0.11)	-8.56**	0.43 (0.60)
Irritability	6.70**	.98	25.82 (0.27)	96.30**	7.71 (1.75)	4.42**	-0.93 (0.13)	-7.29**	0.70 (0.85)
Effortful control	0.09	1.00	35.35 (0.28)	125.35**	12.73 (1.84)	6.92**	0.56 (0.11)	4.73**	1.88 (0.69)
Parenting									
Rejection	0.37	1.00	8.11 (0.24)	32.70**	8.67 (1.41)	6.16**	-0.61 (0.13)	-4.72**	2.24 (0.54)
Inconsistent discipline	2.63	.99	8.77 (0.29)	30.50**	10.11 (1.86)	5.43**	-1.11 (0.14)	-7.95**	0.37 (0.87)
									0.42

Note. Standard errors are reported in parentheses. CFI = comparative fit index; var. = variance. $N = 190$.

* $p < .05$.

** $p < .01$.

Table 5

Unstandardized Path Coefficients and Standardized Coefficients for the Relations of Demographic Variables With the Intercept and Slope Factors of Temperament and Parenting

Variable	Family income		Maternal education		Single-parent status	
	Intercept	Slope	Intercept	Slope	Intercept	Slope
Fear	-0.15* (0.07)	-0.04 (0.03)	-0.15 (0.13)	-0.06 (0.06)	0.84 (0.47)	0.16 (0.23)
	-0.13	-0.12	-0.01	-0.09	0.02	0.07
Irritability	-0.27** (0.08)	-0.03 (0.04)	-0.32** (0.16)	-0.08 (0.07)	1.64** (0.58)	-0.07 (0.28)
	-0.13	-0.07	-0.12	-0.11	0.13	-0.02
Effortful control	0.26** (0.09)	0.04 (0.04)	0.29 (0.17)	0.07 (0.07)	-1.90** (0.60)	-0.35 (0.26)
	0.12	0.09	0.01	0.08	-0.12	-0.11
Rejection	-0.22** (0.08)	-0.04 (0.04)	-0.09 (0.15)	-0.02 (0.08)	1.42 (0.53)	-0.27 (0.28)
	-0.18	-0.07	-0.02	0.02	0.08	-0.08
Inconsistent discipline	-0.29** (0.09)	-0.05 (0.05)	-0.28 (0.17)	-0.09 (0.08)	1.56* (0.62)	0.41 (0.31)
	-0.20	-0.14	-0.05	-0.11	0.08	0.15

Note. Standard errors are in parentheses.

* $p < .05$.

** $p < .01$.

Table 6
Relations Between Growth in Temperament and Parenting and Their Prediction of Adjustment Problems

Variable	Model fit		Growth relations			Time 3 adjustment	
	$\chi^2(22)$	CFI	Temp. intercept → par. slope	Par. intercept → temp. slope	Internalizing	Externalizing	
Fear ^a and					17.97**/16.73** (2.81)/(2.38)	8.71**/7.04** (2.25)/(1.59)	
Rejection	59.61**	.98	-0.10* (0.04)	0.01** (0.01)	0.92/0.87	0.43/0.26	
Inconsistency	39.85*	.99	-0.19	0.15	0.39 (2.32)	6.31* (2.89)	
Irritability ^a and			-0.12* (0.05)	-0.02* (0.01)	0.03	0.56	
Rejection	50.03**	.98	-0.16	-0.22	-0.86 (0.95)	2.48* (1.08)	
Inconsistency	70.87**	.98			-0.07	0.69	
Effortful control ^a and					30.20**/13.87** (3.52)/(2.89)	11.86**/2.15 (1.03)/(2.63)	
Rejection	57.89**	.99	0.03 (0.03)	0.01** (0.01)	0.27/0.24	0.32/0.14	
Inconsistency	60.38**	.99	0.08	0.16	2.12 (2.73)	5.26 (2.97)	
			0.07** (0.02)	0.01 (0.01)	0.09	0.07	
			0.19	0.03	2.53 (1.99)	5.50* (2.48)	
					0.14	0.27	
					-11.60**/-5.58* (-17.59)/(-2.83)	-7.51**/-4.59* (1.31)/(-2.34)	
Rejection	57.89**	.99	-0.01** (0.002)	0.01 (0.01)	0.39/0.18	0.67/-0.25	
Inconsistency	60.38**	.99	-0.38	0.03	7.81** (1.37)	6.18** (1.21)	
			-0.04 (0.04)	0.00 (0.01)	0.29	0.80	
					13.17 (12.81)	12.00* (5.16)	
			-0.12	0.00	0.09	0.28	

Note. Values are the unstandardized coefficients (standard errors) and standardized coefficients from conditional latent growth curve models. Income was controlled. CFI = comparative fit index; Corr. = correlation; btw. = between; Temp. = temperament; Par. = parenting.

^a Effects of temperament on outcome depended on the parenting variable in the model; therefore, values are those for the models with rejection/inconsistency, respectively. $N = 190$.

* $p < .05$.

** $p < .01$.