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Developmental Risk and Goodness of Fit in the Mother–Child Relationship: Links to Parenting Stress and Children's Behaviour Problems

Rebecca P. Newland and

Bradley/Hasbro Children's Research Center, Warren Alpert Medical School of Brown University

Keith A. Crnic

Arizona State University

Abstract

Despite the compelling nature of goodness of fit, empirical support has lagged for this construct. The present study examined an interactional approach to measuring goodness of fit and prospectively explored associations with mother-child relationship quality, child behavior problems, and parenting stress across the preschool period. In addition, as goodness of fit might be particularly important for children at developmental risk, the presence of early developmental delay was considered as a moderator of goodness of fit processes. Children with (n = 110) and without (n = 137) developmental delays and their mothers were coded while interacting in the lab at child age 36 months and during naturalistic home observations at child ages 36 and 48 months. Mothers also completed questionnaires at child age 60 months. Results highlight the effects of child developmental risk as a moderator of mother-child goodness of fit processes across the preschool period. There was also evidence that the goodness of fit between maternal scaffolding and child activity level at 36 months influenced both mother and child functioning at 60 months. Findings call for more precise models and expanded developmental perspectives to fully capture the transactional and dynamic nature of goodness of fit.

Keywords

behavior problems; child development; developmental psychopathology; early childhood; parent-child relationships; parenting stress

Developmental Risk and Goodness of Fit in the Mother-Child Relationship: Links to Parenting Stress and Children's Behavior Problems Goodness of fit is a highly intuitive and conceptually appealing concept that addresses core transactional processes in parent-child relationships. However, decades after Thomas, Chess, and Birch's (1968) original formulation, goodness of fit remains a relatively poorly operationalized construct with insufficient supporting empirical evidence. The breadth of the concept provides a richness

Correspondence concerning this article should be addressed to Rebecca P. Newland, Bradley/Hasbro Children's Research Center, 1 Hoppin Street, Suite 204, Providence, RI 02903. rebecca_newland@brown.edu.

Rebecca P. Newland, Bradley/Hasbro Children's Research Center, Department of Psychiatry and Human Behavior, Warren Alpert Medical School of Brown University; Keith A. Crnic, Department of Psychology, Arizona State University.

for relationship theory, but complications for empirical research. Stronger operational approaches could take fuller advantage of the compelling theoretical framework to better capture goodness of fit processes. Further, it might also be the case that goodness of fit is particularly salient under the context of risk, as fit may be more difficult to accomplish but also most essential for these children. The current study examines goodness of fit, individual parent and child characteristics (maternal scaffolding and child activity level), and parent-child relationship quality as determinants of child behavior problems and parenting stress during early childhood in children with and without developmental risk.

Conceptual Approaches to Measurement of Goodness of Fit

Although early research on parenting and child development focused on parent-driven processes, Bell (1968) called attention to the substantial impact that children can have on parental behaviors and shifted the field to recognize bidirectional influences in the parent-child relationship (Pettit & Arsiwalla, 2008). In line with this perspective, Thomas and Chess' (1977) frequently cited definition posits that "goodness of fit results when the properties of the environment and its expectations and demands are in accord with the organism's own capacities, characteristics, and style of behaving" (p. 11).

A number of approaches have been put forth to further elaborate and operationalize the goodness of fit concept. One approach, used extensively by Lerner, Lerner, and colleagues, has focused on the match or mismatch between parents', teachers', or peers' expectations and children's actual behavioral or temperamental characteristics (Lerner & Lerner, 1987; Windle & Lerner, 1986). Although this method is relatively direct and straightforward, the approach has a few notable limitations (Plomin & Daniels, 1984; Windle & Lerner, 1986). Most importantly, expectations of parents and teachers in these studies may represent "ideal" traits for children, rather than specific expectations or desires for an individual child. Further, this approach focuses on degree of similarity between parent expectations and child behaviors, overlooking any interactions among parent and child characteristics. A more recent approach defined fit in terms of parents' appraisals by developing a novel interview method which focused on parental representations of goodness of fit (Seifer, Dickstein, Parade, Hayden, Magee, & Schiller, 2014). This approach provides a subjective measure of goodness of fit in individual parent-child dyads, which emphasizes the truly relational nature of the construct. However, the subjective interview method has not yet been mapped onto the objective parent-child behaviors which may contribute to fit.

A final, and perhaps the most commonly used, strategy for measuring goodness of fit compares parent and child characteristics to determine which combination of traits or behaviors relates to optimal child functioning. An interaction between specified parent and child traits or behaviors that predicts child adjustment, over and above the additive effects, is conceptualized as an indication of fit (Bates, 1989; Plomin & Daniels, 1984). Thus, a methodology that utilizes interaction terms implies that goodness of fit is defined as the interplay of parent and child traits that produces favorable child outcomes; in other words, optimal parent characteristics depend on child characteristics, and vice versa. Although each strategy for measuring goodness of fit likely produces important and unique information about good parent-child fit, the interaction or behavior/trait matching strategy likely provides

the strongest approach for understanding the ways in which the interplay between *nuanced* parent and child behaviors can create a favorable context for the child (and, subsequently, better developmental outcomes).

An expansive body of research that does not explicitly purport to study goodness of fit, including investigations of interactions between child temperament and parenting behaviors, is actually consistent with the overarching structure of this construct (see table in van Aken, Junger, Verhoeven, van Aken, & Dekovic, 2007; Belsky, Hsieh, & Crnic, 1998; Lengua, Wolchik, Sandler, & West, 2000). In addition, the more contemporary concept of differential susceptibility (Belsky & Pluess, 2009) is rooted in assumptions similar to goodness of fit (Shiner, Buss, McClowry, Putnam, Saudino, & Zentner, 2012). Differential susceptibility suggests that particular child traits in the context of a positive rearing environment may produce especially favorable outcomes, whereas the same traits in the context of an adverse rearing environment may lead to particularly negative outcomes (Belsky & Pluess, 2009). Thus, both theories attempt to address explanations for why different children may respond to the same environment in distinct ways.

Regardless of the strategies for measurement, goodness of fit is typically studied as a predictor of child outcomes. It may, however, also be associated with a multitude of family processes. An area that has received little attention is the relation between goodness of fit and overall parent-child relationship quality, despite the fact that temperament and goodness of fit may be seen as fully relational constructs (Seifer, 2000; Seifer & Sameroff, 1986). Recent research identified an association between parent-child goodness of fit and attachment security, when controlling for relevant family, parent, and child factors (Seifer et al., 2014), supporting a potential link between goodness of fit and parent-child relationship quality. If, indeed, parent-child goodness of fit and relationship quality are associated, or even overlapping constructs, understanding parent-child relationships across the developmental period could provide insight into the operationalization of goodness of fit processes.

Previous research has primarily focused on the influence of good parent-child fit on child functioning without particular concern for the potentially meaningful influence of goodness of fit on parent functioning and specifically on parenting stress. A wealth of evidence exists to support the fact that increased parenting stress is linked to poorer parent and child functioning (Crnic & Low, 2002), and parent factors, child characteristics, and the parent-child relationship are likely all important contributors to levels of parenting stress (Crnic & Low, 2002; Deater-Deckard, Smith, Ivy, & Petril, 2005). Importantly, good parent-child fit may not be equally beneficial for both children and parents. For instance, if the processes by which parents form good fitting relationships with their more challenging children creates increased stress, subsequent parent-child relationship quality might suffer due to a reduction of parental wellbeing. Thus, it may be especially important to expand goodness of fit perspectives to include parent, child, and relational contributors to parenting stress in addition to more traditional concerns associated with child functioning.

Goodness of Fit in the Context of Developmental Risk

Goodness of fit processes are especially important for children at risk for developing behavior problems, as fit in the parent-child relationship may act as a protective factor against adverse outcomes. Alternatively, a lack of fit may be detrimental for children for whom risk is already present, such as those children who experience early developmental delay. Children with developmental delays reflect a specific subset of developmental risk and experience increased behavior problems, with rates approximately three times as high as typically developing children (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 2003).

The presence of developmental risk stresses the parent-child relationship (Baker et al., 2003), and exploring ongoing interactions in such dyads may offer a specific view of goodness of fit processes. Parent-child interactions may be altered for children with developmental delays. Indeed, increased parental directiveness, persistence, and intrusiveness have all been found in parental behavior for children with delays (Floyd, Harter, & Costigan, 2004), suggesting greater parental focus on goal directed teaching during interactions, rather than simple play (Hodapp, 2002). In addition, parents of children with delays tend to express more negativity in dyadic interactions (Beck, Daley, Hastings, & Stevenson, 2004; Newland & Crnic, 2010) although such findings are not ubiquitous (Floyd et al., 2004). Nonetheless, challenging behavioral characteristics in children affect caregiving response (Crockenberg & Leerkes, 2003) and parent-child relationships in families of children with developmental delays may further explicate the nature of goodness of fit.

Child Activity and Maternal Scaffolding as Specific Contributions to Fit

Goodness of fit was originally developed by Thomas and Chess (1977) as a framework for understanding caregivers' varied responses to children with "difficult" temperaments. Accordingly, temperament is often viewed as a central component of goodness of fit, capturing individual differences in children's contributions to parent-child processes. Defining temperament has created a substantial challenge (Goldsmith et al., 1987). The current state of temperament research highlights that "temperament traits are early emerging basic dispositions in the domains of activity, affectivity, attention, and self-regulation, and these dispositions are the product of complex interactions among genetic, biological, and environmental factors across time" (p. 437, Shiner et al., 2012).

Activity level is considered a core temperamental construct across the temperament theories (De Pauw & Mervielde, 2010; Mervielde & Asendorpf, 2000), and is likely to be especially relevant for the study of parent-child goodness of fit. One reason is because child activity level is not universally associated with adaptive or maladaptive behavioral styles or developmental trajectories. For example, highly active children may be described as developmentally mature and extraverted, but also may exhibit under-controlled behaviors and distractibility (Eaton, 1994). Additionally, activity level may be particularly sensitive to contextual factors and elicit varied caregiving behaviors (Buss, 1981; Fagot & O'Brien, 1994; Gandour, 1989). Overall, the parenting context provided to children at different levels of motoric activity may be quite salient in determining developmental competencies,

suggesting that child activity level is an ideal temperamental trait for understanding parent-child goodness of fit in early childhood.

In addition to child contributions, specific qualities of parenting may be central to relational goodness of fit processes and emerging child psychopathology. Scaffolding, as one example, refers to a parent's ability to support and structure an activity to help a child succeed at a level beyond what the child would be able to achieve independently (Maslin-Cole & Spieker, 1990; Vygotsky, 1978). Effective scaffolding requires awareness of the child's needs, as well as responding in a non-intrusive manner. Although scaffolding is often considered as most relevant to the development of cognitive processes, it can refer to a range of social and affective contexts as well. Effective scaffolding can support the emergence of children's regulatory capacities, and is associated with better developmental outcomes across domains (Baker, Fenning, Crnic, Baker, & Blacher, 2007; Hoffman, Crnic, & Baker, 2006). In relation to child behavior, parents' active structuring of the environment might be vital for children at both high and low activity levels. Parental scaffolding may either harness or expand children's engagement with their surroundings as a function of the way that parents help regulate child arousal in difficult moments (Calkins, 1994).

In the context of developmental delay, the interaction between child activity level and parental scaffolding may be especially representative of goodness of fit processes. Children with unexplained developmental delays have been rated as less active than children with identified diagnostic syndromes (Marcovitch, Goldberg, MacGregor, & Lojkasek, 1987), and responsive parenting may be especially influential for children at risk, as these children may require additional support and scaffolding (Landry, Smith, & Swank, 2006). Indeed, maternal scaffolding has been found to predict later social competence among children with early identified delays (Baker et al., 2007). When mothers are able to effectively guide child activity level to be appropriately engaged with the environment, children at developmental risk might develop more adaptive and well-regulated behaviors, and, consequently, mothers may experience less stress in the parenting role.

The Present Study

Despite the robust conceptual appeal of goodness of fit, evidence in support of the construct is limited and impeded by the methodological complexities inherent in its assessment. The present study utilizes the interaction approach to explore the interrelations among maternal scaffolding and child temperamental activity level, in order to understand the complex contributions to emerging child behavior problems and parenting stress. Within this approach, a significant interaction represents good parent-child fit, in that the effect of child temperament on developmental outcomes depends on parenting behaviors. It was hypothesized that good fit, over and above maternal scaffolding and child activity level, would predict better relationship quality, fewer child behavior problems, and less parenting stress. More specifically, it was expected that the effects of maternal scaffolding on relationship quality, behavior problems, and parenting stress would be stronger for the children with higher levels of motoric activity (as this is more typically representative of a "difficult" temperamental style). In addition, child risk status was expected to moderate goodness of fit processes, such that the match between parent and child characteristics

would be a more important contributor to relationship quality, child behavior problems, and parenting stress for children at risk.

Method

Participants

Participants included 247 children between the ages of 36 and 60 months and their mothers. Participants were drawn from a larger longitudinal investigation which prospectively explored family processes, emotion regulation, and the emergence of behavior problems in typically developing (TD) and developmentally delayed (DD) children ages 3 to 9. Children were classified as either TD or DD based on scores on the Mental Developmental Index (MDI) subscale of the Bayley Scales of Infant Development II (BSID II, Bayley, 1993) administered at age 3. Children who scored below 75 were classified as DD (n = 110; Mean MDI = 60.05, SD = 12.82), and children who scored 85 or above were classified as TD (n = 137; Mean MDI = 104.57, SD = 11.70). A small number of children were classified as borderline (n = 12), with MDI scores between 75 and 85. Given the risk inherent in early borderline functional status (Fenning, Baker, Baker, & Crnic, 2007), these children were included with the DD group. Participants were recruited from central Pennsylvania and southern California through community agencies, including early childhood centers, family resource centers, preschools, and early intervention programs, and through flyers posted in the community. Families were excluded from the larger study if the child had severe neurological impairment, was non-ambulatory, or had a history of abuse. In addition, any child with an identified syndrome or specific developmental diagnosis (e.g., autism) was excluded at initial recruitment, as children with undifferentiated early developmental delays were of focal interest.

Demographic characteristics of the sample by group status (DD vs. TD) are shown in Table 1. Families of children with DD have lower levels of education, lower family incomes, are less likely to be married, and more likely to have other adults living in the home. Finally, there are a greater number of males with DD, consistent with prevalence rates of intellectual disability (American Psychiatric Association, 2000). With regard to the present study, attrition was 11.3% (n=28) between 36 and 60 months. Families who attrited significantly differed from families who remained in the study in terms of child developmental status (18 of the 28 attrited families had a child with DD, p = .03). Families did not differ on any other demographic characteristic or on the 36 month observational ratings.

Procedures

Initial assessment—During an initial home visit when the child was approximately 36 months old, a trained graduate student administered the BSID II. Demographic information was also collected from the families during this visit.

Lab observations—Children and mothers visited the laboratory at 36 months old. Trained graduate students led the participants through a structured protocol (described in our previous research, e.g., Reference Blinded for Review, and similar to tasks used by others to assess child and parental behaviors during challenging situations, e.g., Calkins & Dedmon,

2000; Kochanska, Coy, & Murray, 2001). First, the child and the mother were given a basket of age-appropriate toys, and the experimenter left them alone for 10 minutes, during which they could play with the toys in whatever manner they wished. Subsequently, the experimenter presented three joint-problem solving tasks, in increasing order of difficulty. The problem solving tasks were allotted 2, 3, and 5 minutes, respectively, and the experimenter left the room while the child completed the tasks. Following the joint-problem solving tasks, a delay of gratification task was presented. Finally, the child was instructed to clean up the toys.

Home observations—A home visit was conducted when children were 36 and 48 months old, to obtain naturalistic observational data (Reference Blinded for Review). Observations were scheduled when the whole family would be present, often around dinnertime. The observations lasted approximately 90 minutes, during which time observers recorded data over 6 ten minute episodes of interaction. Each 10 minute period of observation was followed by a 5 minute period in which coders rated parent-child behaviors and interactions. Observers were instructed to be as unobtrusive as possible and to follow the child as the focal object of the observation, but to also attend to the parent and dyadic interactions.

Questionnaire data—Each year within 2 weeks of the child's birthday, mothers completed a series of questionnaires to assess child and family functioning, and returned them by mail. Parents also completed several brief questionnaires at the inception of each home observation.

Measures

Developmental status—Developmental status of the child was assessed using the Mental Development Index (MDI) subscale of the Bayley Scales of Infant Development II (BSID-II), a widely used measure of mental development in children (Bayley, 1993). The MDI is normed, with a mean of 100 and a standard deviation of 15.

Child activity level—Child activity level was assessed during the 36 month naturalistic home observations using the Parent-Child Interaction Rating System (PCIRS; Belsky, Crnic, & Gable, 1995). Trained coders used the PCIRS to assess the extent to which the child was physically active on a 5-point scale for which higher scores represent higher or greater levels of the attribute (i.e., constantly moving, prefers active games). Ratings were composited across the 6 ten minute observation periods, and the composited reliability was acceptable ($\alpha = .74$).

Maternal scaffolding—Maternal scaffolding was assessed during the 36 month lab tasks using the Maternal Scaffolding Coding System (Maslin-Cole & Spieker, 1990). This 5-point scale measures the effectiveness of maternal scaffolding during the problem solving and clean up tasks. Three dimensions of scaffolding were coded and composited for the present study. Motivational scaffolding reflects the mother's ability to help the child become engaged and maintain enthusiasm. Technical scaffolding measures the mother's ability to structure the task to allow the child to complete the task successfully. Emotional scaffolding

assesses the mother's ability to make the task a positive experience for the child. Reliability was acceptable (α = .84).

Mother-child relationship quality—The PCIRS was also used during the naturalistic home observations to assess dyadic relationship quality, in addition to a number of other behaviors. At child age 48 months, the mother-child dyadic pleasure scale was used, composited across the six observation periods. Mother-child pleasure measures the level of joyfulness, enthusiasm, and the sense that mothers and children enjoy being together. Reliability across each observation period was acceptable (α = .78).

Child behavior problems—Mothers completed the Child Behavior Checklist (CBCL; Achenbach, 1991) at child age 60 months. The 113-item measure asks the respondent to rate child problems over the past 6 months on a 3-point scale. For the present study, the total behavior problem sum was used.

Parenting stress—Parents completed the Parenting Daily Hassles self-report questionnaire (PDH; Crnic & Greenberg, 1990) during a home observation at 60 months. The PDH includes questions on child and family hassles and on general life hassles. The two scales reflect the frequency and the perceived intensity of hassles. The perceived intensity of child and family hassles score, completed by mothers, was used in the current study. Acceptable reliability (Cronbach's α = .90) has been previously reported (Crnic, Gaze, & Hoffman, 2005).

Coding reliability—To establish reliability for all observational scales (i.e., the PCIRS and the Maternal Scaffolding Coding System), observers were trained by watching videotaped lab observations until they reached sufficient reliability (over 70% exact agreement and 95% agreement within one scale point with the criterion coder). Individual observers were paired to code the videotapes, and the criterion coder watched 20% of all tapes. Reliability was maintained at a kappa of .6 or greater. Given that kappa is a conservative estimate of reliability, .6 is considered acceptable (Fleiss, Cohen, & Everitt, 1969).

Data Analytic Plan

All statistical procedures described below were analyzed using structural equation models (SEM) with full information maximum likelihood (FIML) estimation in Mplus 7.2 (Muthén & Muthén, 1998–2014). A percentile bootstrap resampling procedure was used in all analyses. An SEM model was analyzed to simultaneously test the anticipated interrelations of the constructs, and both direct and indirect paths between the constructs were included. Demographic variables that significantly differentiated the TD and DD groups and were associated with the outcomes were considered as possible covariates in the analyses. Maternal education was explored as a possible covariate in all analyses, as it is correlated with socioeconomic status and parenting behaviors (Bornstein, Hahn, Suwalsky, & Haynes, 2002). Covariates that significantly predicted variables in the models were retained for the final analyses. Overall fit was tested with χ^2, root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and Comparative Fit Index

(CFI). Good fit was defined as CFI values .≥95, RMSEA values ≤.06, and SRMR values ≤. 08 (Hu & Bentler, 1999).

The SEM model was tested using stacked models, so as to explore possible moderation by developmental risk status. Stacked models provide overall fit statistics with the full sample, and individual parameter estimates for models with the TD and DD samples. Equality constraints were then used to test for group differences. A fully constrained model was compared to models wherein paths that appeared different between groups were allowed to vary. Results from chi square difference tests determined whether the unconstrained models fit the data significantly better than the constrained model. Paths that produced a significant improvement in fit when freed between groups were considered moderated paths. The final model chosen was the most parsimonious model that best fit the data, according to the chi square difference tests.

Results

Descriptive statistics for the full sample, as well as split by developmental status, are presented in Table 2, and correlations split by developmental status are shown in Table 3. The full model tested the associations between child activity level at 36 months, maternal scaffolding at 36 months, the activity by scaffolding interaction, mother-child relationship quality at 48 months, child behavior problems at 60 months, and parenting stress at 60 months. The path model was tested split by child developmental status. Each path showing potential differences in significance levels between the groups was tested for invariance using equality constraints. The best fitting model is shown in Figure 1, with parameter estimates in Table 4. Covariates are not depicted in the figure for ease of readability but are included in the table.

The two paths moderated by child developmental status were the path from the activity by scaffolding interaction to child behavior problems and the path from the activity by scaffolding interaction to parenting stress. A model with these two paths freely estimated and all other paths constrained across groups fit significantly better than the fully constrained model,$\Delta \chi^2$ (2) = 17.73, $p < .001$, and was thus chosen as the final model. The model had a good fit to the data: $\chi^2(21) = 17.792$, *ns*, CFI = 1.00, RMSEA = .00, SRMR = .07.

Results indicated that mother-child relationship quality at 48 months was not significantly predicted by child activity level, maternal scaffolding, or the interaction of the two constructs at 36 months. Maternal scaffolding at 36 months and a pleasurable mother-child relationship at 48 months were both significantly negatively associated with later parenting stress at 60 months.

For the DD group, the interaction between child activity level and maternal scaffolding at 36 months was significantly associated with both child behavior problems and parenting stress at 60 months, but these paths were not significant in the TD group. The interactions were probed within the context of the full model. In terms of child behavior problems (see Figure 2), results suggested that for highly active children, higher levels of scaffolding were

associated with fewer behavior problems and lower levels of maternal scaffolding were associated with more child behavior problems ($p < .05$ for the simple slope for child activity level at one standard deviation above the mean). The same pattern was found for children exhibiting average activity levels, at a trend level ($p = .083$ for the simple slope for mean child activity level). In contrast, when children exhibited low activity levels, maternal scaffolding was unrelated to child behavior problems ($p = .94$ for the simple slope for child activity level at one standard deviation below the mean). With regard to parenting stress (see Figure 3), a similar pattern of results was found. Specifically, for children with high and average levels of activity, increased maternal scaffolding was related to decreased parenting stress ($p < .01$ for the simple slope for child activity level at one standard deviation above the mean; $p < .05$ for the simple slope for mean child activity level), whereas for children exhibiting low activity levels, scaffolding was unrelated to parenting stress ($p = .97$).

Discussion

The present study aimed to provide a more rigorous understanding of the conceptually important construct of goodness of fit in the preschool period by exploring the way that specific parent and child behaviors interact under conditions of developmental risk. Previous efforts have affirmed that understanding interactions between specific parenting behaviors and child temperamental characteristics can provide nuanced insight about optimal parent-child fit (e.g., Dennis, 2006; Kochanska, 1995; Lengua et al., 2000; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990). The current study extended this approach by examining maternal scaffolding behaviors and child activity level, a temperamental trait which may be especially germane to the study of parent-child fit. Findings suggested that neither child activity level nor maternal scaffolding exerted main effects on child behavior problems two years later, and only maternal scaffolding was predictive of later parenting stress. However, the *match* between mother and child characteristics, rather than the absolute nature of scaffolding or activity level, contributed to the emergence of child behavior problems and parenting stress. Further, goodness of fit between these mother and child traits appeared to be more important under conditions in which children experienced developmental risk.

Child activity level has shown inconsistent links to developmental outcomes, and whether highly active children are viewed as adaptive or problematic is at least partially dependent on developmental level and context (Eaton, 1994). For infants, high activity level when exposed to novel stimuli has been predictive of high inhibition (Kagan, Snidman, & Arcus, 1998). Conversely, low activity level in preschool-aged children has been associated with internalizing problems, whereas high activity level has been linked with both externalizing problems and comorbidities (Lavigne et al., 1996). Consistent with these latter findings, mothers who perceive their preschool-aged children as highly active reported higher levels of parenting stress (McBride, Schoppe, & Rane, 2002).

In our sample, we did not find direct associations between child activity level at 36 months and either child behavior problems or parenting stress at 60 months, regardless of the child's developmental status. However, the unique strength of the interaction approach for measuring goodness of fit is that it allows for a precise understanding of fit between *specific*

child temperamental traits and parenting behaviors. By capitalizing on this strength, potentially important patterns were uncovered when the goodness of fit interaction approach was used to examine relations among child activity level, maternal scaffolding, and child developmental risk. For typically developing children and their mothers, the interaction between child activity level and maternal scaffolding was not associated with later behavior problems or parenting stress. But for children with developmental delays and their mothers, goodness of fit proved to be critical in understanding the contributions of activity level and scaffolding to parent and child outcomes. For these children who also exhibited high motoric activity, more effective scaffolding produced a better fit, in terms of both child behavior problems and parenting stress two years later.

Overall, it may be that goodness of fit is more easily achieved by non-stressed families (Allen & Prior, 1995), but that good fit may be more critical for families of children at risk. Given multiple risk factors – early developmental delay and high activity level – well-matched parenting behaviors (i.e., effective scaffolding) influenced child developmental outcomes more so than for children at lower levels of risk (i.e., typically developing and/or low activity level). Results are consistent with the notion of vantage sensitivity. Vantage sensitivity, a derivation of differential susceptibility, proposes that individuals with particular inherent characteristics (e.g., activity level) may be particularly susceptible to positive environmental influences (e.g., scaffolding; Pluess & Belsky, 2013). Accordingly, the discrepancies in findings related to children's activity level (Eaton, 1994) may be related to supportive environmental influences, consistent with both goodness of fit and vantage sensitivity. When parents are able to appropriately support and scaffold their children's highly active temperaments, such that these children learn to skillfully engage with the environment and regulate their own behaviors, these otherwise difficult children may disproportionately benefit from the well-matched parenting behaviors.

Mother-child goodness of fit was not only linked to child functioning, but also was related to mothers' stress. When mothers were not able to match their children's activity levels with better or more effective scaffolding, mothers were at greater risk of experiencing elevated parenting stress. This was, again, only true in the context of developmental risk. Nevertheless, this connection may highlight the transactional relations between child behavior problems and parenting stress (Neece, Green, & Baker, 2012), as children in poor fitting dyads (i.e., with developmental delays, high activity level, and mothers who engaged in low levels of scaffolding) exhibited more behavior problems at age 5. In addition, it may be that a child who shows developmental delay in combination with challenging temperamental traits is especially burdensome for parents, as suggested by Thomas and Chess (1977), whereas a child with developmental delays but easier to manage temperamental characteristics would not have the same adverse relation to parenting stress. Regardless, it is apparent that goodness of fit, at least within the domains of child activity level and maternal scaffolding, contributes to *both* mother and child wellbeing during the preschool period.

Given the inherently relational nature of goodness of fit (Seifer & Sameroff, 1986), it was expected that goodness of fit would link clearly to parent-child relationship quality. However, no connections emerged between the two constructs. The lack of association could

be due to the specific indices used to represent goodness of fit – maternal scaffolding and child activity level. This particular representation of goodness of fit and mother-child relationship quality might not always be analogous, particularly given that our measurement of mother-child relationship quality reflected traits such as joyfulness, enthusiasm, and a sense of mutual enjoyment of each other's company. These traits may not be congruent, at all times and in all contexts, with the scaffolding strategies needed to produce positive child outcomes for children at varying activity levels.

Grusec and Davidov (2010) highlighted the importance of domain-specific parental behavior, arguing that effective parenting styles and mechanisms of socialization cannot be universal across all contexts. Indeed, goodness of fit represents not only a match between child and parent, but also a consideration of the context in which the parent and child are interacting. In the current study, mother-child relationship quality was assessed during a naturalistic home observation when the child was 4 years old, and as such, the specific contexts of the interactions vary across families. Although some parent-child dyads may have been playing together during the observation period, others may have been engaging in routine family activities (mealtimes, bathing, etc.). Effective parenting for children with different temperamental activity levels might require more directive parenting and gentle discipline, which may not be assessed as highly mutually enjoyable, as required by the coding system. Thus, good fit may not, and should not, always correspond to pleasurable, joyful mother-child interactions within all contexts. However, despite the lack of connection in the present study, it remains theoretically compelling that mother-child goodness of fit would link to positive mother-child relationship quality under conditions in which different indicators of fit are used or, perhaps, when relationship quality is aggregated across all interactions.

Despite the many strengths of the current study, including the multi-method longitudinal design, several limitations should be noted. First, just as much of the research on bidirectional parent-child relationships neglects fathers (Pardini, 2008), only mothers were included in the current study. Second, the present study included children with developmental delays, which offered an opportunity to consider families along a continuum of developmental risk. Some findings are likely specific to this group, and future investigations should consider families facing a variety of risk conditions. Third, given the individualized nature of goodness of fit, more nuanced relations may have been uncovered by modeling even more specific dyadic processes. For example, the demographic factors treated as covariates (e.g. marital status, race, and socioeconomic status) might instead be tested as moderators of goodness of fit relations

Goodness of fit remains an elusive concept; one with strong conceptual appeal but also one that is difficult to operationalize. The current study extended models of goodness of fit by utilizing a precise interaction approach between child activity level and maternal scaffolding and identifying child developmental risk as a moderator of fit processes. At the specific construct level, our findings clarify why children with active temperaments experience varied developmental outcomes, depending on contextual factors. At a broader level, our results expand conceptualizations of goodness of fit to underscore the importance of dyadic fit processes on both parent and child functioning. Finally, the findings demonstrate that the

presence of multiple risks create particular vulnerability to poor parent-child fit. Expanded developmental perspectives will continue to broaden our understanding of the mechanisms by which goodness of fit is created in the parent-child child relationship and the complex trajectories set into motion by good or poor fit.

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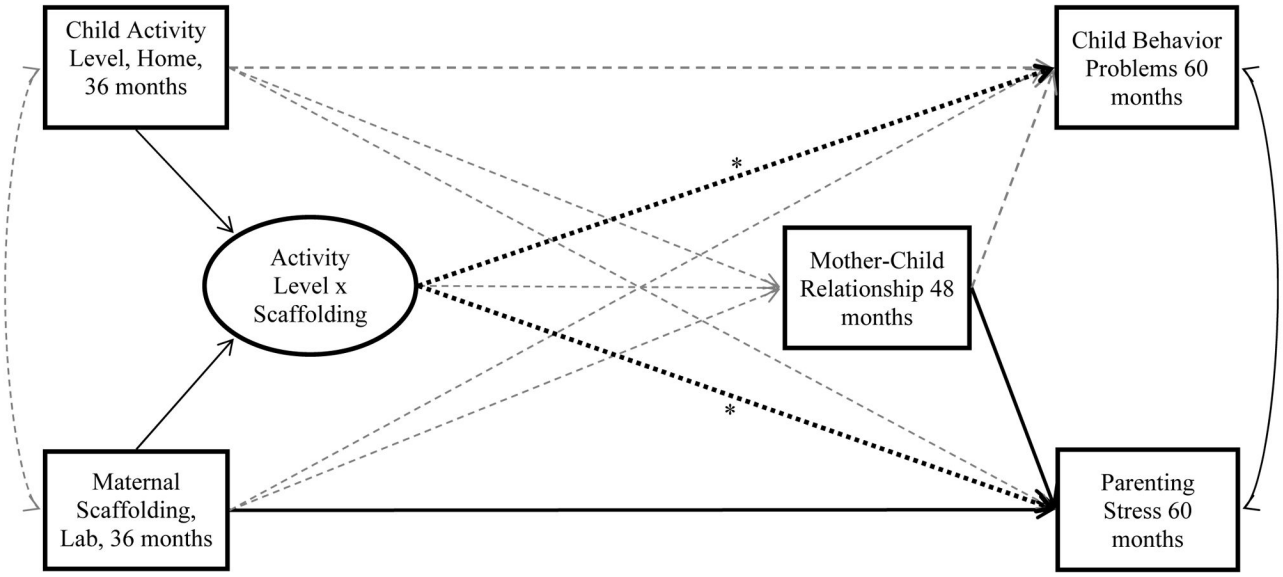

Figure 1.

Goodness of fit SEM model. Covariates are not shown for ease of readability. Bold black lines indicate significant path estimates at $p < .05$. Bold black dashed line with * indicate paths that are significantly moderated by developmental status. Grey dashed lines indicate nonsignificant paths.

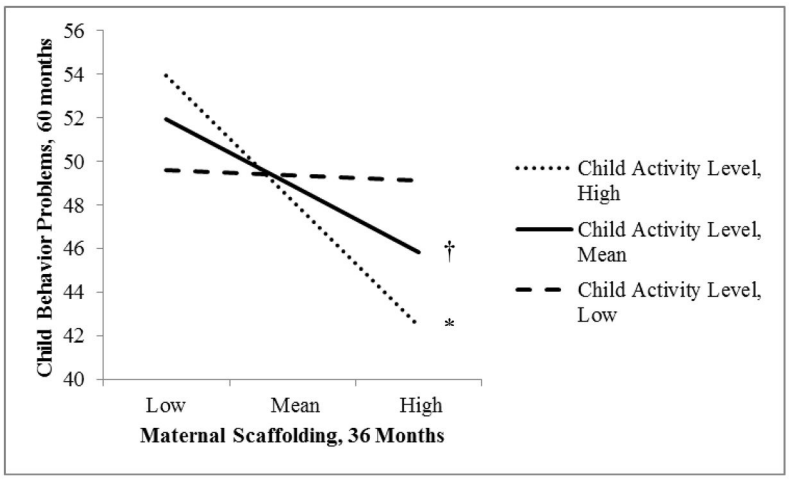

Figure 2.

Probed interaction in the DD group between child activity level and maternal scaffolding at 36 months on child behavior problems at 60 months. Simple slopes which are significant at $p < .05$ are denoted with an *. Simple slopes with a significance level of $p < .09$ are denoted with †.

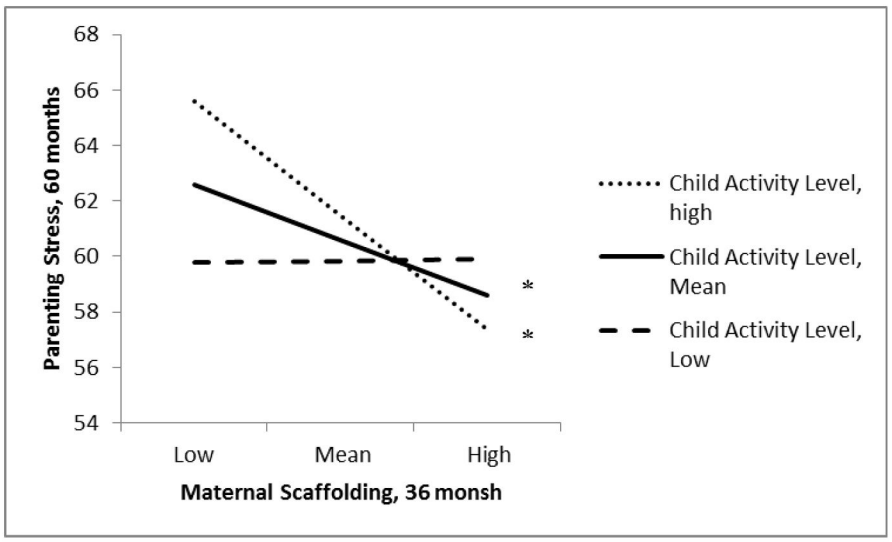

Figure 3.

Probed interaction in the DD group between child activity level and maternal scaffolding at 36 months on parenting stress at 60 months. Simple slopes which are significant at $p < .05$ are denoted with an *.

Table 1

Demographic Characteristics of Delayed and Non-Delayed Samples

Variable	Delayed (*n*=110)	Non-Delayed (*n*=137)	*t* Score	Chi Square
Child Variables				
Bayley Scale: MDI Mean Score[a]	Mean=60.05 *SD*=12.82	Mean=104.57 *SD*=11.70	**28.48** **	
Gender (% male)	66.4%	51.1%		**5.84** *
Race (% Caucasian)	60.0%	61.3%		.04
Siblings (% only children)	29.1%	29.2%		.00
Parent Variables				
Marital Status at child age 3 (% married)	79.1%	89.8%		**5.48** *
Other adults in home	25.8%	14.3%		**4.65** *
Mother's Race (% Caucasian)	60.0%	66.4%		1.09
Mother's Education (% college degree)	29.1%	60.5%		**24.32** **
Father's Race (% Caucasian)	64.6%	66.9%		.13
Father's Education (% college degree)	33.0%	57.4%		**12.98** **
Biological Father	92.9%	97.0%		2.09
Median Family Income	$35,001–50,000	$50,001–70,000	**3.67** **	

[a]Mental Development Index

*$p<.05$,

**$p<.01$

Table 2

Descriptive Statistics of Key Variables by Developmental Status

Variable	Overall	Delayed	Non-Delayed	*t* Score
Child activity level				3.18**
Mean (*SD*)	2.95 (.68)	2.80 (.69)	3.08 (.65)	
N	240	108	132	
Maternal scaffolding				4.13**
Mean (*SD*)	3.48 (.71)	3.27 (.71)	3.64 (.67)	
N	237	103	134	
Mother-child pleasure				.71
Mean (*SD*)	1.55 (.55)	1.52 (.56)	1.58 (.55)	
N	221	97	124	
Child behavior problems				−4.42**
Mean (*SD*)	34.25 (24.31)	42.78 (27.62)	27.86 (19.54)	
N	215	92	123	
Parenting stress				−1.53
Mean (*SD*)	48.32 (12.29)	49.86 (14.00)	47.19 (10.80)	
N	218	92	126	

*$p<.05$,

**$p<.01$

Table 3

Intercorrelations of Key Variables Split by Developmental Status

Variable	1	2	3	4	5
1. Child activity, 36 mos.	—	−.07	.03	−.01	.16
2. Maternal scaffolding, 36 mos.	.01	—	.02	−.17	−.24*
3. Mother-child pleasure, 48 mos.	.09	.10	—	−.22*	−.23*
4. Child behavior problems, 60 mos.	−.01	−.08	−.03	—	.60**
5. Parenting stress, 60 mos.	.02	−.07	−.24**	.37**	—

Note. Correlations above the diagonal represent the scores for children with developmental delays (DD); scores below the diagonal represent the scores for typically developing (TD) children. Pairwise deletion was used; *n* for the children with DD ranged from 88 to 102 and *n* for TD children ranged from 120 to 129.

* $p<.05$,

** $p<.01$

Table 4

Parameter Estimates of Goodness of Fit SEM Model

	B	SE	β	*p*-value
Child activity, 36 mos. → Mother-child pleasure, 48 mos.	.06	.05	.07	.26
Scaffolding, 36 mos. → Mother-child pleasure, 48 mos.	.05	.06	.07	.36
Activity X scaffolding, 36 mos. → Mother- child pleasure, 48 mos.	.12	.08	.09	.13
Child activity, 36 mos. → Child behavior problems, 60 mos.	−1.22	2.67	−.04	.65
Scaffolding, 36 mos. → Child behavior problems, 60 mos.	−4.33	2.50	−.14	.08
DD: Activity X scaffolding, 36 mos. → Child behavior problems, 60 mos.	**−20.83**	**7.77**	**−.43**	**<.01**
TD: Activity X scaffolding, 36 mos. → Child behavior problems, 60 months	5.84	4.65	.12	.21
Mother-child pleasure, 48 mos. → Child behavior problems, 60 mos.	−4.58	2.59	−.12	.08
Marital status, 36 mos. → Parenting stress, 60 mos.	**−2.23**	**.90**	**−.15**	**.01**
Child activity, 36 mos. → Parenting stress, 60 mos.	1.22	1.18	.07	.30
Scaffolding, 36 mos. → Parenting stress, 60 mos.	**−2.81**	**1.20**	**−.16**	**.02**
DD: Activity X scaffolding, 36 mos. → Parenting stress, 60 mos.	**−9.32**	**2.85**	**−.38**	**<.01**
TD: Activity X scaffolding, 36 mos. → Parenting stress, 60 mos.	.27	2.12	.01	.90
Mother-child pleasure, 48 mos. → Parenting stress, 60 mos.	**−5.16**	**1.34**	**−.24**	**<.01**

Note. M-C = mother-child. Bolded values are significant at $p < .05$. DD refers to a path estimate for the group with developmental delays; TD refers to a path estimate for the typically developing group. All paths not specified were estimated for the full sample.