

**Identifying the Associations between Child Temperament
and Father Involvement:
Theoretical Considerations and Empirical Evidence**

Center for Research on Child Wellbeing
Working Paper **#2006-24-FF**

by

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June 2006

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Earlier versions of this article were presented at the National Council on Family
Relations Annual Meeting in November 2005, and at the Population Association of
America Meeting in April 2006.

The author is grateful to Rebekah Levine Coley and to Jacqueline Lerner for their
support, and their suggestions and comments on earlier drafts of this article. Special
thanks are extended to Oded Bizan for his encouragement and teaching. The views
expressed are those of the author solely.

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Abstract

Using a sample of resident fathers (either married or cohabiting) from the Fragile Families and Child Wellbeing Study ($N = 2,213$), this study assessed the relationship between child temperament and father involvement. The direct effects of child temperament on father involvement, as well as its moderating effect on the association between other predictor variables and father involvement were measured. A two-equation model was estimated, using a two-stage least squares (2SLS) regression procedure. Findings suggest that fathers are less involved with temperamentally difficult children than with temperamentally easy children. Further, temperament moderated the strength of the association between parental relationship quality and father involvement for married fathers. Implications for intervention programs targeted at increasing paternal involvement are discussed.

KEYWORDS: Father Involvement, Child Temperament, Parental Relationship Quality, Moderation Effects, Endogeneity-Exogeneity, 2SLS.

Introduction

Scholarship on paternal behavior has grown enormously during the last several decades. Paternal involvement in parenting and the role fathers play during the early years of life have become of special interest. This increased interest is linked to changes in society and family. While fathers were traditionally defined by their role as breadwinners and disciplinarians, they are now also defined by their nurturing role (Lamb, 2000). Contributions to changes in conceptualizations of fatherhood include economic and employment factors (Amato, 1998) and new family structures (Doherty, Kounesky, & Erickson, 1998; Marsiglio, Day, & Lamb, 2000). However, despite the advances in the field, there is no comprehensive theory of father involvement. Fathering is seen as a complex construct with different dimensions, and different frameworks have been proposed for the study of parenting processes in general (Belsky, 1984) and of fathering in particular (Amato, 1998; Doherty, Kouneski, & Erikson, 1998; Hawkins & Dollahite, 1997; Lamb, Pleck, Charnov, & Levine, 1987; Marsiglio, Day, & Lamb, 2000; Palkovitz, 1997).

Current research focuses on different aspects of fatherhood, including antecedents of father involvement and its impact on child development. Regardless of the conceptual framework being used, one of the central questions in empirical research is why are some fathers more involved than others? In light of recent findings about the positive effects of father involvement on their children's well-being (see Amato, 1998; Amato & Gilbreth, 1999; Palkovitz, 2002), as well as on processes of paternal growth and maturation and the father's personal development (Hawkins & Dollahite, 1997), questions like this are of great importance to researchers, clinicians, and policy makers alike.

Factors Associated with Father Involvement

A widely used conceptual framework for the study of parenting processes was introduced by Belsky (1984). In this framework, parenting behavior is determined by parents' personal psychological resources (e.g. parents' psychological functioning, developmental history), the contextual sources of stress and support (e.g., marital relations, social support, occupational experiences), and child characteristics (e.g., age, gender, temperament). While this model suggests that characteristics of children that make them more or less difficult to care for shape the quantity and quality of the parental care they receive, very little research focuses on the influence of child characteristics on paternal behaviors.

Most current research on father involvement focuses on how father characteristics and parental relationship quality affect paternal involvement. For example, some studies find that father characteristics such as father's role identity predict father involvement (Ihinger-Tallman, Pasley, & Buehler, 1995; Henley & Pasley, 2005). These studies suggest that the more a father identifies with the father role (the meaning the father attributes to himself in the status and role of parent), the more involved he is with his children.

The quality of the couple's relationship is another factor associated with parental behavior for both men and women (Blair, Wenk, & Hardesty, 1994). The couple's relationship is seen as an important source of support for parents and has been linked to the quality of parent-child relationships (Erel & Burman, 1995). Several empirical studies have looked at the association between parental relationship quality and parenting behavior. Specifically for fathers, it has been suggested that a conflictive relationship

with the child's mother is related to less responsive (Volling & Belsky, 1991) and more negative and intrusive (Belsky, Youngblade, Rovine, & Volling, 1991) fathering, whereas a strong or positive couple's relationship increases the probability of the father being very involved with his children (Coley & Chase-Lansdale, 1999), and is related to positive attitudes towards his children and his role as a parent (Cox, Owen, Lewis, & Henderson, 1989), and to low levels of parenting stress (Cowan & Cowan, 1987). On the other hand, father involvement affects the quality of parental relationship. For example, parenting itself decreases the quality of the marital relationship (Belsky, 1990; Waite & Lilard, 1991). Furthermore, uncooperative coparenting behavior predicts deterioration in marital functioning (Belsky & Hsieh, 1998).

The directionality (or bi-directionality) between father involvement and parental relationship quality remains unclear. Most studies focus on either how parental relationship quality affects paternal involvement or on how paternal involvement affects parental relationship quality, and the methods employed are not suited to determine one direction of influence. Thus, it could be argued either that conflict in the parental relationship undermines father involvement, or that it is the low involvement of fathers in their children's lives that leads to parental conflict. Therefore, father involvement and parental relationship quality could both be seen as endogenous variables that simultaneously affect each other. Prior researchers failed to account for this endogeneity in their analyses, posing a risk for obtaining biased estimates.

Child Temperament and Parenting Behavior

According to the parenting model introduced by Belsky (1984), the parents' behavior is determined by different factors, including child characteristics, such as temperament.

Thomas & Chess (1977) defined temperament as the stylistic component of behavior ("how" a person does something as opposed to "what" she does). Temperament has some biological or constitutional basis and expresses itself at birth (Lerner, 1983). Even though temperament is modifiable by environmental characteristics, it is physiologically based and relatively consistent over time, especially in the first year of life. According to Thomas and Chess (1977), temperamentally easy children are characterized by positive approach responses to new stimuli (including new people and environments), fast adaptability to change, and moderately intense positive mood. By contrast, children who tend to be negative in response to new stimuli, are slow to adapt to change, and often express intense negative mood have been described as temperamentally difficult. Temperament has received attention in the literature as a child characteristic that influences parents. For example, children's temperament affects the quality of parental relationships (Lindsey, Caldera, & Colwell, 2005; Stoneman, Brody, & Burke, 1989). Similarly, it affects parenting behavior (Bell, 1968; Scarr & McCartney, 1983). Child temperament also affects parents' confidence, management styles, and hence their level of involvement (Thomas & Chess, 1977).

While the impact of child temperament on parenting behavior has received attention in the empirical literature in the context of both parents' behaviors, the vast majority of research has examined the links between child temperament and mothering. For example, child temperament has been related empirically to parenting stress and

ability, suggesting that mothers of temperamentally difficult infants in general report greater stress (Gelfand, Teti, & Fox, 1992). Difficult temperament has also been related to discomfort in the role of parent (Sheeber & Johnson, 1992). In addition, difficult temperament is associated with less positive maternal behaviors such as lower maternal responsiveness and lower mother-child interaction over time (Campbell, 1979; Maccoby, Snow, & Jacklin, 1984).

In addition to measuring the direct relationship between children's temperament and mothering behaviors, some studies have examined how interactions between temperament and the mother's characteristics affect her parenting behavior. These studies suggest that temperament moderates the association between the maternal personality and her parenting behavior (Clark, Kochanska, & Ready, 2000; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990).

Child Temperament Affecting Father Involvement

Despite prior work that suggests that fathering is more affected by contextual factors than mothering (Doherty, Kounesky, & Erickson, 1998), only recently studies have started examining associations between children's temperament and fathering behavior. It has been shown that fathers of children who are more temperamentally difficult face a greater challenge to their parenting ability, and report lower pleasure associated with parenting and increased parenting stress (Grych & Clark, 1999). Similarly, fathers of temperamentally difficult children experience a decrease in their sense of control and efficacy across the transition to parenthood (Sirignano & Lachman, 1985). Associations were also found between fathers' perceptions of child temperament and parenting stress and involvement (McBride, Schoppe, & Rane, 2002). Several studies

revealed an association between difficult temperament and less positive paternal behaviors. For example, fathers are more affectionate and responsive with children who are perceived as less difficult (Volling & Belsky, 1991), and fathers are more available to temperamentally easy sons than to temperamentally difficult sons (Manlove & Vernon-Feagans, 2002). In contrast, other studies on the relationship between child temperament and fatherhood suggested that child temperament does not play any role in shaping the father's behavior (Jain, Belsky, & Crnic, 1996; Woodworth, Belsky, & Crnic, 1996).

Existing literature is limited in several important ways. First, key endogenous variables (variables that simultaneously affect one another, specifically parental relationship quality and father involvement) were treated as exogenous predictor variables. As indicated earlier, previous studies have suggested that either parental relationship quality or father involvement affects the other, thus ignoring bi-directionalities, resulting in estimation bias. Second, previous studies on temperament and fathering behavior focused on measuring the direct effect of child temperament on father involvement, neglecting other possible types of effects, such as temperament moderating the relationship between other predictor variables and father involvement. Third, studies of child temperament focused on predominantly Anglo-American, middle class, martially intact families and relied almost exclusively on mother reports of child temperament to predict parenting behavior, thus ignoring the potentially different perceptions of fathers and mothers of the child's temperament.

The current study seeks to expand prior work at both the theoretical and empirical levels. On the theoretical side, the current study expands Belsky's (1984) conceptual model. Belsky's (1984) model focuses on the direct effect of constructs on parenting

behavior and abstracts from the much more complex bidirectional relationships surrounding child rearing in a family. The present study seeks to identify this complex set of relationships among key constructs. Specifically, two important dimensions are introduced into the model (Figure 1). First, relationships among endogenous predictor variables are made explicit. Based on empirical findings that suggest that parental relationship quality affects father involvement and that father involvement affects the quality of parental relationships, the present study treats the relationship between these constructs as bidirectional, or endogenous to one another. Second, in addition to the main direct effects of child temperament on father involvement, the moderating effects of child's temperament on other key predictor variables are considered as follows: (1) In light of recent empirical findings that suggest that child's temperament interacts with the mother's characteristics to predict maternal behavior, the modified conceptual model proposes that child temperament has a moderating effect on the association between father's role identity and father involvement; (2) Based on research findings that suggest that children's temperament affects the quality of parental relationship, this new conceptual model suggests that child temperament has a moderating effect on the association between parental relationship quality and father involvement.

This study estimates an empirical model that is consistent with the modified conceptual model and a series of hypotheses are tested. The empirical model assesses whether fathers of temperamentally easy children are more likely to be involved in their children's lives than fathers of temperamentally difficult children. Additionally, it addresses the bi-directional relationships between father involvement and parental relationship quality by estimating a two-stage least squares regression model in which

both variables are treated as endogenous. Also, in the empirical model, child temperament is interacted with other variables (specifically parental relationship quality and father's role identity) so that it is possible to statistically test whether it has any moderating effect, in addition to its main direct effect.

To overcome additional methodological limitations in past research, this study uses a more representative sample (married and cohabiting fathers, ethnically diverse) and reports of both parents for most of the main constructs of interests to help to correct for reporter bias.

Guided by the modified conceptual model, this study examined empirically two hypotheses: (1) Fathers of "easy" children are more likely to be involved in their children's lives than fathers of "difficult" children; (2) Child temperament has a moderating effect on father's role identity; that is, temperament affects the strength of the association between father's role identity and father involvement: Fathers of temperamentally difficult children with a given role identity are less involved than fathers of temperamentally easy children with the same degree of role identity; and (3) Child temperament has a moderating effect on parental relationship quality; that is, temperament affects the strength of the association between parental relationship quality and father involvement: Fathers of temperamentally difficult children with a given parental relationship quality are less involved than fathers of temperamentally easy children with the same parental relationship quality.

Method

Sample

The present study uses data from the Fragile Families and Child Wellbeing Study. This multi-wave survey is intended to provide longitudinal information about unmarried and married parents and their children (Reichman, Teitler, Garfinkel, & McLanahan, 2001). The survey follows a birth-cohort of 4,898 children born between 1998 and 2000 in twenty cities in the United States with populations over 200,000. The survey population included 3,712 children born to unmarried couples and 1,186 that were born to married couples. In-hospital baseline interviews with mothers and fathers were conducted separately, close to the birth of the child. Follow up interviews with both parents were conducted approximately one year later.

The current study uses a sub-sample of the families surveyed in the Fragile Families and Child Wellbeing Study ($N=2,213$). Data are drawn from the first two waves (baseline and one-year surveys). The sample has been restricted in two ways. First, families that did not have valid data on the outcome variable, father involvement at the second wave ($n=2,109$), were excluded from the sample. Second, non-resident fathers at the second wave ($n=576$) were excluded from the remaining sample because they differ very much from resident fathers in terms of accessibility to their children and therefore their potential involvement.

Attrition analyses were conducted to assess differences between fathers who were and were not included in the sample. The fathers included in the sample differ from the excluded fathers in several ways. The included fathers were more involved ($t(729.64)=35.66, p<.01$), had children with less difficult temperaments ($t(3086.47)=-3.75, p<.01$), and reported better quality parental relationships ($t(4407.64)=14.77, p<.01$), and a stronger father role identity ($t(4698.14)=6.36, p<.01$). In addition to differences in the

main constructs, a higher proportion of the included fathers were Anglo-American ($t(4014.15)=12.39, p<.01$), and a lower proportion were African-American ($t(4896.00)=-8.76, p<.01$). Additionally, the included fathers tend to be more educated ($t(4058.65)=10.07, p<.01$) and to have a higher income ($t(3461.62)=7.37, p<.01$); however, they had a lower employment rate than fathers excluded from the sample ($t(4393.95)=-5.14, p<.01$). Included fathers were older than excluded fathers ($t(3695.18)=5.57, p<.01$), and had younger children ($t(3364.70)=-1.73, p<.10$). These differences suggest that excluded fathers were more disadvantaged than fathers included in the sample, and tended to have poorer family relationships (with both the child and the child's mother).

Measures

Father involvement. Father involvement was assessed at the second wave. Both parents were asked how often in the previous week the father did the following activities with the child: Played games like peek-a-boo or gotcha, sung songs or nursery rhymes, read stories, told stories, played with toys such as blocks or Legos, took child to visit relatives, hugged or showed physical affection, and put child to bed. In addition, only mothers were asked how often in the previous week the father changed diapers and fed or gave a bottle to the child. Responses were scored from zero days a week to seven days a week. These items were factor analyzed separately for fathers and mothers, and loaded into one factor for each parent. Items were averaged into composite measures for fathers and mothers with good internal reliabilities for father report ($\alpha=.76$) and for mother report ($\alpha=.85$). Pearson correlation between the two reports was .26. Mother and father

reports were then averaged into one score to help to correct for reporter bias (mean= 4.50, SD= 1.14), and centered.

Child's temperament. At the second wave both mothers and fathers reported on their child's temperament. Parents were asked how well the following statements describe their child: Child tends to be shy, often fusses and cries, gets upset easily, reacts strongly when upset, is very sociable (reversed), and is friendly with strangers (reversed). Responses were scored from 1 (not at all like my child) to 5 (very much like my child). Higher scores indicate more difficult temperament. These items were factor analyzed separately for fathers and mothers. All items loaded onto one factor, and items were averaged into one composite measure for each parent. Scale reliabilities calculated using Cronbach's Alpha were .50 for fathers and .53 for mothers. Pearson correlation between the two reports was .26. Mother and father reports were then averaged into one score to help to correct for reporter bias (mean= 2.61, SD= .59), and centered.

Quality of parental relationship. Mothers and fathers both reported on the quality of their relationship at wave 2, specifically, on how frequently the other parent displays the following behaviors: is fair and willing to compromise, expresses affection or love, encourages or helps to do things that are important for the other parent, listens when the other parent needs someone to talk to, and really understands the hurts and joys of the other parent. Response choices range from 1 (often) to 3 (never). All items were reversed so that higher scores indicate a better quality of relationship. These 5 items were factor analyzed separately for fathers and mothers. One factor was enough to describe these data for each parent. Items were averaged into composite measures for fathers and mothers with good internal reliabilities for father report ($\alpha = .70$) and for mother report ($\alpha = .77$).

Pearson correlation between the two reports was .21. Mother and father reports were then averaged into one score to correct for reporter bias (mean=2.65, SD= .29). This parental relationship quality scale was corrected for skewness using the transformation function $-\log(\text{Max}(x) + 1 - x)$ where x is the original measure of the parental relationship quality, and then centered.

Father's role identity. At the time of the child's birth fathers reported on their role identity. Specifically, fathers reported on their agreement with the following items: being a father and raising a child is one of the most fulfilling experiences, I want people to know I have a new child, and not being a part of my child's life would be one of the worst things that could happen to me. Response choices range from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate stronger role identity. These three items were factor analyzed, resulting in one factor, and items were averaged into one composite score (Cronbach's α reliability coefficient for this scale was 0.71, mean= 3.76, and SD=.39). This scale was corrected for skewness using the transformation function $-\log(\text{Max}(x) + 1 - x)$ where x is the original measure of the father role identity, and then centered.

Demographics. A number of demographic variables were reported by mothers or fathers and were used in analyses to control for factors that were found in prior research to be associated with father involvement.

Parental relationship status was measured at wave 2 (whether the parents were married or cohabiting). Dummy variables were created to indicate father's race/ethnicity as follows: African-American, Hispanic-American, Anglo-American, and another category that groups Asian-American, Native-American, and other. In addition, a dummy

variable was created to indicate whether father and mother are of different race/ethnicity. Father's and mother's education was measured at wave 1 (1 = no formal schooling to 9 = graduate studies). Both parents' employment status was measured at wave 2 (1 = worked during last week, 0 = did not work during last week). Parents' incomes were also measured at second wave, in absolute dollar amounts per week. Parents' age, in years, was also measured at wave 2. Finally, child's sex (1 = girl, 0 = boy) was asked at time of birth, and child's age was measured at wave 2 (in months).

Analysis

The empirical analog to the conceptual model comprises of a system of two equations including a father involvement equation and a parental relationship quality equation as follows:

$$(1) \quad \text{FatherInvolvement} = \alpha + \beta_1 \text{ChildTemperament} + \beta_2 \text{ParentalRelationshipQuality} + \beta_3 \text{FatherIdentity} + \beta_4 \text{Controls} + \varepsilon_1$$

$$(2) \quad \text{ParentalRelationshipQuality} = \delta + \phi_1 \text{ChildTemperament} + \phi_2 \text{FatherInvolvement} + \phi_3 \text{FatherIdentity} + \phi_4 \text{Controls} + \varepsilon_2$$

where $\alpha, \beta_1, \dots, \beta_4, \delta, \phi_1, \dots, \phi_4$ are parameters to be estimated and ε_1 and ε_2 are normally distributed error terms.

The primary focus of this study is on estimating the parameters of the first equation, which contains the endogenous explanatory variable parental relationship quality. Analyses were conducted using a two-stage least square (2SLS) regression procedure. The 2SLS procedure explicitly addresses the bi-directional relationships between father involvement and parental relationship, treating the two variables as

endogenous. In most empirical studies of developmental processes the endogeneity of some explanatory variables is ignored, resulting in biased estimates of the relationship between key variables and the dependent variable (Duncan, Magnuson & Ludwig, 2004). In the context of this study, adopting such an approach would mean using the explanatory variable parental relationship quality to estimate father involvement in an equation using OLS regression. However, this would lead to a biased estimate of father involvement because not all the assumptions of the OLS model hold. Particularly, the assumption that the predictor variables are uncorrelated with the error term is violated because parental relationship quality is endogenous. That is, the quality of the parental relationship simultaneously influences the degree of father involvement and is influenced by the degree of father involvement.

To obtain unbiased estimates for the parameters in equation (1) it is necessary to estimate the two equations jointly. This can be done using the method of instrumental variables (IV) by applying an estimation procedure known as two-stage least squares (2SLS) (Woolridge, 2003).

To apply this method, it is necessary to use at least one instrumental variable for the endogenous variable parental relationship quality. A valid instrumental variable has to be uncorrelated with the error term in the father involvement regression equation, and must be correlated with the endogenous variable parental relationship quality.

2SLS estimates can be obtained in two stages. In the first stage, OLS regression analyses estimate the endogenous explanatory variable parental relationship quality at wave 2 on the instrumental variables (all measured at wave 1): the parental relationship quality, the frequency of parental disagreement, and whether parents shared leisure

activities, all three at the time of the first wave. When parental relationship quality is regressed on these instrumental variables it assigns weight to the instruments and produces the predicted parental relationship quality. Then, the predicted value of the endogenous variable parental relationship quality is derived. In the second stage, the dependent variable father involvement is regressed on the predicted explanatory variable parental relationship quality. The estimated coefficient of the predicted variable is the 2SLS estimate of the parameter β_2 .

Whether to use the 2SLS model or to use the OLS model can be tested statistically by applying the Hausman specification test (Hausman, 1978).

To examine whether child temperament has a moderating effect on father role identity and the parental relationship quality two interaction terms were added to equation (1) as follows:

$$(3) \quad \begin{aligned} \text{FatherInvolvement} = & \alpha + \beta_1 \text{ChildTemperament} + \beta_2 \text{Parental RelationshipQuality} \\ & + \beta_3 \text{FatherIdentity} + \beta_4 \text{Controls} \\ & + \beta_5 \text{Parental RelationshipQuality} \times \text{ChildTemperament} \\ & + \beta_6 \text{FatherIdentity} \times \text{ChildTemperament} + \varepsilon_1 \end{aligned}$$

Testing the hypothesis that child temperament has a moderating effect on father role identity and on parental relationship quality requires testing the significance of the parameters β_5 and β_6 .

Results

Descriptive statistics for the entire sample and by parents' relationship status are presented in Table 1. The sample included 2,213 families with resident fathers (52%

cohabiting and 48% married). The first four rows correspond to the key variables in the model.

Fathers averaged 29.7 years at the second wave, and mothers were approximately two years younger. Forty-four percent of the fathers were African-American, 27% Hispanic-American, 26% Anglo-American, and the remaining 3% were Asian-American, Native-American, or other race. The sample was primarily working class: both parents averaged a high school diploma for educational level, and 82% percent of fathers worked in the week prior to the interview.

Three variables were used as instrumental variables for parental relationship quality at wave 2: the parental relationship quality, the frequency of parental disagreement, and whether parents shared leisure activities, all at the time of the first wave. These variables are correlated with the parental relationship quality at wave 2 (correlation coefficient are .25, -.17, and .09 respectively), and are not expected to be correlated with the error term in the father involvement regression.

Estimating a 2SLS model is consistent with the conceptual model presented above, but it is also possible to empirically test for endogeneity of parental relationship quality using the Hausman specification test. Consistent with the conceptual model, the Hausman test does not reject the 2SLS model ($\chi^2=4.94$, $p<0.996$).

A comparison between OLS-based and 2SLS-based estimates is presented in Table 2. OLS results suggest that a child's difficult temperament is negatively related to father involvement and that the quality of the parental relationship and the father's role identity are positively related to father involvement. No differences were found across races, but it is suggested that when the parents are of different ethnic groups fathers tend

to be more involved. Also, estimation results indicate that fathers tend to be more involved when they are more educated, but less involved when their income is higher. However, they tend to be more involved when the mother is employed and when her income is higher. Estimation results also indicate that fathers tend to be less involved with daughters than with sons.

Comparable 2SLS results are reported in the second column of Table 2. The estimates of main effects obtained for the 2SLS model are qualitatively the same as in the OLS model. However, accounting for the endogeneity of the parental relationship quality affects the magnitude of the effects of the key variables. Compared to OLS-based estimates, the (negative) effect of child temperament on father involvement is 24% higher, the coefficient for the parental relationship quality is 273% higher, and the coefficient for the father's role identity is 24% higher. Furthermore, whether the parents are of different ethnic groups or not is not a significant predictor of father involvement in the 2SLS model.

The difference in results when accounting for the endogeneity of the parental relationship quality is substantial when testing for moderating effects. In the OLS and 2SLS model specifications, four interaction terms were included: (1) Cohabiting parents with parental relationship quality with child temperament; (2) Married parents with parental relationship quality with child temperament; (3) Cohabiting parents with father's role identity with child temperament; and (4) Married parents with father's role identity with child temperament. These specifications are designed to test the moderating effect of child temperament on either the parental relationship quality or the father's role identity for different relationship statuses (cohabiting and married) (Baron & Kenny, 1986).

Estimates based on the OLS model indicated no moderating effect of child temperament. By contrast, 2SLS-based estimates suggest that child temperament has a moderating effect on parental relationship quality when the parents are married. In general, the better the quality of parental relationship is the higher the degree of father involvement is. Based on the estimated effect of the interaction terms, at any given quality the parental relationship, married fathers of children who are temperamentally difficult are less involved when compared to fathers of children who are temperamentally easy. (Figure 2).

Discussion

This paper addresses the question of how child temperament is related to father involvement. First, this paper extends the commonly used conceptual model of parenting developed by Belsky (1984). The extended conceptual model makes explicit a complex and interactive relationship among key constructs that is based on recent empirical findings. In particular, the extended model describes the interactions among two endogenous variables, namely, father involvement and parental relationship quality, and suggests different paths through which child temperament affects father involvement. Guided by the extended conceptual model, the effect of child temperament on father involvement was examined empirically using data from the Fragile Families and Child Wellbeing Study (Reichman et al, 2001). Three hypotheses were tested: (1) Fathers of “easy” children are more likely to be involved in their children’s lives than fathers of “difficult” children; (2) Child temperament has a moderating effect on father’s role identity; that is, temperament affects the strength of the association between father’s role identity and father involvement: Fathers of temperamentally difficult children with a given role identity are less involved than fathers of temperamentally easy children with

the same degree of role identity; and (3) Child temperament has a moderating effect on parental relationship quality; that is, temperament affects the strength of the association between parental relationship quality and father involvement: Fathers of temperamentally difficult children with a given parental relationship quality are less involved than fathers of temperamentally easy children with the same parental relationship quality.

Results from the present study suggest that child temperament is an important factor affecting father involvement, and indicate main effects and moderating effects on the relationship between another predictor variable (specifically parental relationship quality) and father involvement.

Predictors of Father Involvement

A central finding of this study is that fathers of temperamentally easy children are more likely to be involved in their children's lives than fathers of temperamentally difficult children. This finding is consistent with Belsky's (1984) model which argues that parental behavior is affected by child characteristics and that characteristics of children that make them more or less difficult to care for shape the quantity and quality of the parental care they receive. Prior research found mixed evidence regarding the association between father involvement and child temperament. While there is evidence that father involvement and child temperament are associated (Doherty, Kounesky, & Erickson, 1998), only recently studies have started examining associations between children's temperament and fathering behavior. While it has been shown that fathers of temperamentally difficult children are less involved with their children (Grych & Clark, 1999; Manlove & Vernon-Feagans, 2002; McBride et al, 2002; Sirignano & Lachman, 1985; Volling & Belsky, 1991) other studies found no association between these two

constructs (Jain, Belsky, & Crnic, 1996; Woodworth, Belsky, & Crnic, 1996). Results from the present study are consistent with previous findings that a child's sex plays a role in relation to father involvement, and that fathers are more involved with sons than with daughters. One possibility is that fathers choose to be more involved with sons, regardless of their temperament, and choose to be less involved with daughters, especially when they are of difficult temperament. Further research is needed to explore whether child's sex, in addition to the main effect on paternal behavior, moderates the association between child temperament and father involvement. This question is out of the scope of the present study.

A second important finding is that child temperament also affects father involvement by moderating the association between quality of the parental relationship and father involvement for married fathers. In general, the better the quality of parental relationship, the higher the degree of father involvement. Based on the estimated effect of the interaction terms, married fathers with a given parental relationship quality that have children who are temperamentally difficult are less involved compared to fathers with the same parental relationship quality that have children who are temperamentally easy. This finding is consistent with the new conceptual model proposed in this study, in which child temperament interacts with other predictor variables to predict father involvement. No prior research has addressed this interaction. Previous findings suggested that child's temperament affects the quality of the parental relationship (Lindsey et al, 2005; Stoneman et al, 1989), and that the quality of parental relationship affects paternal involvement (Belsky et al., 1991; Blair et al, 1994; Coley & Chase-Lansdale, 1999; Cowan & Cowan, 1987; Cox et al, 1989), but no prior research had studied whether child

temperament has a moderating effect on the association between parental relationship quality and father involvement. Therefore, this finding constitutes an important extension to prior studies.

Results from the present study suggest a difference in the magnitude of moderating effects of child temperament between cohabiting and married fathers. These results can be interpreted in different ways. One interpretation is that married fathers allow themselves to choose to be less involved in their child's life when the child's temperament is difficult because they are legally and effectively part of the family and therefore do not need to please the child or the child's mother in order to remain a part of the family. On the other hand, fathers who are not married and only cohabit with the child's mother have a commitment to the family that is not bounded by a legal agreement. Such fathers may choose to stay involved with their child even when the child's temperament is difficult, either because they have elected to remain with the child and the child's mother, or because of the risk of being asked to leave the household.

A third important finding is that child temperament has no moderating effect on the association between the father's role identity and father involvement. In the context of mothering behavior, it has been suggested that temperament moderates the association between characteristics of the mother and her parenting behavior (Clark et al, 2000; Mangelsdorf et al, 1990). However, no prior research has addressed this interaction specifically in the context of fatherhood. It could be argued that fathers who strongly identify themselves with the father role and attribute a significant meaning to themselves in the status and role of a parent are less affected by contextual factors. Further research

could explore what factors help to initially shape this father identity, and what factors can alter this identity as fathers and children grow and develop.

This study also identified several contextual factors that are related to father involvement. First, there were no differences in father involvement across races. Second, fathers were less involved when they had a higher income, and more involved when the child's mother worked and had a higher income. These findings are consistent with prior research on father involvement in dual-earner families, where both parents work and fathers need to share in childcare tasks. Fourth, fathers tended to be more involved when they were more educated.

Like any other study, this work has limitations. First, findings from the present study are not ultimately conclusive. While this study addresses the endogeneity of parental relationship not all potential endogeneous factors are controlled for. For example, father involvement may affect child temperament. Typically, temperament is characterized as physiologically based and relatively consistent over time. Nevertheless, it is modifiable by environmental influences (Thomas & Chess, 1977). Indeed, some research findings suggest that infants who became less difficult over time had mothers who were more expressive and involved with them, as well as more sensitive to their needs (Matheny, 1986; Washington, Minde, & Goldberg, 1986), and that infants who became more difficult over time had fathers who were less involved than their wives (Belsky, Fish, & Isabella, 1991). This study assesses the correlates of father involvement at a single age. All the constructs of this study could be measured in further studies at different points in time so that change in the predictors, especially possible changes in child's temperament, could be related to further change in father involvement.

Second, this study used father data and only families who responded to the father involvement questions were included in the sample. It is reasonable to expect that men who responded to the survey are more involved in their children's lives than men who did not respond. Also, the sample utilized in this study was not a random sample of the population, but rather a selected sub-sample of a representative sample of low-income families surveyed at the Fragile Families and Child Wellbeing Study, and therefore findings cannot be generalized to all families. Keeping this limitation in mind, however, the present study adds information on predictors of father involvement for different parental relationship statuses.

Summary

This study contributes to the literature on father involvement in several ways. First, by extending the commonly used conceptual model proposed by Belsky (1984) this study illuminates the complex interactions between key variables that are used as predictors of father involvement. At the conceptual and empirical levels it is stressed that child temperament serves as a moderator of associations between parental relationship quality and father involvement for married fathers, and that father involvement and the quality of the parental relationship affect one another. A common practice in developmental studies is to treat endogenous variables as exogenous (Duncan, Magnuson, & Ludwig, 2004). This study demonstrated that ignoring the endogeneity of the parental relationship quality when predicting father involvement leads to seriously biased estimates of the effect of key variables.

Second, while previous studies have investigated predominantly Anglo-American, middle class families, the findings of this study extend the literature on determinants of father involvement by investigating a diverse population.

A few questions remain unanswered and open avenues for further research. First, results from the present study suggest a difference in the magnitude of moderating effects of child temperament between cohabiting and married fathers. Are there differences in the magnitude of these effects between groups excluded from the present sample, mainly non-resident fathers? Evidence about this question may have implications for intervention programs for parenting and families, and more specifically for fathering. For example, evidence that suggests that some groups of fathers are more responsive to child temperament may suggest that programs targeting at increasing father involvement in their children's lives should differ in their emphasis on dealing with child behaviors associated with temperament with different populations. Further research is needed to examine whether resident and non-resident fathers perceive and react differently to child temperament, and, if so, whether temperament plays a different role for different groups.

Second, the present study focused on discrete tasks the fathers perform with their children rather than on fathers as individuals. Do differences in the types of fathers make them more or less involved in different activities with their children? If so, does child temperament have a different effect? While it is naturally expected that some fathers will show more caretaking behaviors than others or more disciplinarian behaviors than others, due to data limitations the present study did not explore patterns of engagement in activities by types of fathers. Furthermore, it is important to focus not only on discrete fathering behaviors but also on the style of the father-child activities. Additional research

is needed to explore which fathers engage in which role and what are the benefits and disadvantages of that, for children, fathers, and mothers.

Implications for Intervention Programs

The findings of this study inform practice about family relationships and parenting. Particularly, they add information about factors that affect the involvement of fathers in their children's lives. As previous empirical studies show, fathers are important figures in their children's lives, well beyond their role as breadwinners and disciplinarians. Father involvement is important for children's well-being (see Amato, 1998; Amato & Gilbreth, 1999; Palkovitz, 2002), and affects processes of paternal growth and maturation and fathers' own development (Hawkins & Dollahite, 1997). Therefore, understanding what makes some fathers more involved than others is of great importance for practitioners working with families towards increased involvement of fathers.

Intervention programs that aim at improving father-child interaction could encourage fathers to recognize and evaluate their expectations from their children; to identify the unique characteristics of their children in order to promote understanding of the child's behaviors; to recognize characteristics of their children that make them easy or difficult to care for in order to understand how these characteristics affect the quantity and quality of paternal care the fathers provide; to set realistic expectations from the child and from themselves as fathers; and to learn appropriate parenting responses.

This study finds that parental relationship quality affects father involvement, and that this relationship is moderated by the child's temperament. This finding suggest that, rather than focusing on the father alone, interventions could encourage both parents to

evaluate their relationship with each other and their expectations from each other as partners and parents, as well as from the child.

Child temperament specifically has received attention in the literature as a characteristic that influences parenting behavior and it has been suggested that child temperament affects parents' confidence, management styles, and hence their level of involvement (Thomas & Chess, 1977). Prior research findings show that parents of temperamentally difficult children report higher levels of stress, discomfort in the role of parent, and in general less responsiveness, availability, and less parent-child interaction (Campbell, 1979; Gelfand et al, 1992; Grych & Clark, 1999; Maccoby et al, 1984; Manlove & Vernon-Feagans, 2002; McBride et al, 2002; Sheeber & Johnson, 1992; Sirignano & Lachman, 1985; Volling & Belsky, 1991). Given the current understanding of the importance of father involvement for the child well being, intervention programs that assist fathers in recognizing and understanding how their children's characteristics affect their paternal behavior are of extreme importance. The results of the current study provide, in addition to avenues for future research, underlying information on the ways that child's temperament affects father involvement and is thus very useful for the design and implementation of intervention programs.

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Table 1. *Means and (Standard Deviations) of Study Variables for Whole Sample and by Father Relationship Status*

	All Fathers (N=2213)	Married Fathers (N=1055)	Cohabiting Fathers (N=1158)
Outcome Variable:			
Father Involvement	4.50 (1.14)	4.58 (1.09)	4.42 (1.19)
Predictor Variables:			
Child Temperament	2.61 (.59)	2.52 (.57)	2.69 (.60)
Parental Relationship Quality	2.65 (.29)	2.69 (.28)	2.62 (.28)
Father's Role Identity	3.76 (.39)	3.78 (.37)	3.73 (.40)
Controls			
Parents are Cohabiting	.52 (.50)	-----	-----
Parents are Married	.48 (.50)	-----	-----
Father is African-American	.44 (.50)	.30 (.46)	.56 (.50)
Father is Hispanic-American	.27	.25	.28

	(.44)	(.43)	(.45)
Father is Anglo-American	.26	.40	.14
	(.44)	(.29)	(.34)
Father is Other Race	.03	.05	.02
	(.18)	(.21)	(.15)
Father and mother are different race	.12	.12	.13
	(.33)	(.32)	(.34)
Father's Education	5.12	5.85	4.45
	(1.84)	(1.98)	(1.38)
Mother's Education	5.20	5.95	4.51
	(1.85)	(1.94)	(1.45)
Father Employed	.82	.91	.74
	(.38)	(.28)	(.44)
Mother Employed	.54	.56	.52
	(.50)	(.50)	(.50)
Father's Income	573.82	773.73	391.70
	(560.39)	(651.04)	(380.30)
Mother's Income	236.25	290.84	186.52
	(318.09)	(388.51)	(225.27)
Father's Age	29.71	31.95	27.67
	(7.04)	(6.66)	(6.75)
Mother's Age	27.24	29.50	25.18
	(6.15)	(5.90)	(5.62)

Child's Age in Months	15.17	15.04	15.29
	(3.44)	(3.47)	(3.42)
Female Child	.48	.48	.48
	(.50)	(.50)	(.50)

Table 2 *Regression Results for OLS and 2SLS**Dependent Variable: Father Involvement*

	Model	
	OLS	2SLS
Child Temperament	-.13*	-.13*
	(.05)	(.05)
Parental Relationship Quality	4.08**	9.77**
	(.38)	(1.79)
Father's Role Identity	.69*	.71*
	(.27)	(.28)
Father is Hispanic-American	-.06	-.02
	(.06)	(.06)
Father is Anglo-American	.02	.08
	(.06)	(.06)
Father is Other Race (except African-American)	-.09	-.01
	(.13)	(.14)
Father and Mother are Different Race	.16*	.10
	(.07)	(.07)
Father's Education	.04*	.04**
	(.02)	(.02)
Mother's Education	.01	.01
	(.02)	(.02)
Father Employed	-.03	-.05

	(.07)	(.07)
Mother Employed	.13*	.11 ⁺
	(.06)	(.06)
Father's Income	-.00**	-.00**
	(.00)	(.00)
Mother's Income	.00**	.00**
	(.00)	(.00)
Father's Age	-.01	-.00
	(.00)	(.00)
Mother's Age	-.01	-.01
	(.01)	(.01)
Child's Age	-.00	-.00
	(.01)	(.01)
Female Child	-.09 ⁺	-.09 ⁺
	(.04)	(.04)
Parental Relationship × Temperament	-.05	.51
	(.63)	(2.65)
Role Identity × Temperament	-.49	-.52
	(.48)	(.49)
Married Parents × Temperament	.04	-.01
	(.08)	(.08)
Married Parents × Parental Relationship	-.80	2.07
	(.55)	(4.02)

Married Parents \times Role Identity	-.09 (.42)	.17 (.43)
Married Parents \times Parental Relationship \times Temperament	-.36 (.90)	-1.33* (.65)
Married Parents \times Role Identity \times Temperament	-.10 (.73)	-.25 (.76)
Constant	.65** (.17)	.65** (.18)
N	2213	2213
Adjusted R ²	.13	.07
F-Statistic	14.63**	8.25**

⁺ p<.10, *p<.05, **p<.01

Notes:

- In the 2SLS regression model, 3 variables were used as instruments for parental relationship quality in wave 2: Parental relationship quality in wave 1, parental conflict in wave 1, and leisure activities the parents do together in wave 1.
- Standard errors in parentheses.

Figure 1. *Relationships between Father Involvement, Child Temperament, Parental Relationship Quality, and Father Role Identity*

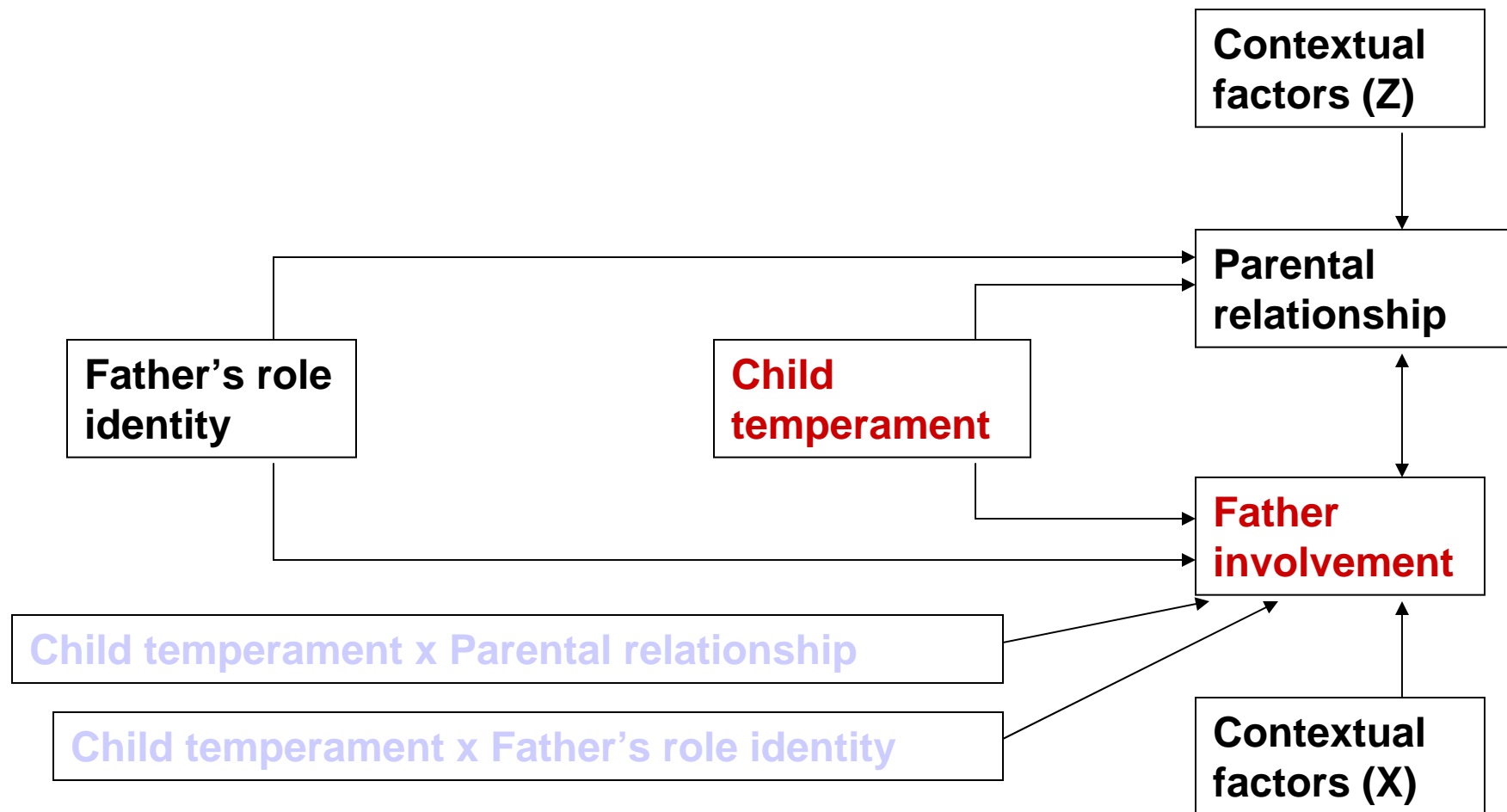


Figure 2
Moderation Effect of Child Temperament on the Association between Parental Relationship Quality and Father Involvement - Married Fathers

