

RUNNING HEAD: Adolescent-Father Reciprocity

Youth Influencing Fathers and Fathers Influencing Youth:
Adolescent Delinquency and Nonresident Father Involvement

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Abstract

Using a representative sample of low-income, primarily minority adolescents ($N = 647$, aged 10 to 14 years at wave 1), this study examined bidirectional longitudinal relations between nonresident father involvement, defined as contact and responsibility for children's care and behavior, and adolescent engagement in delinquent activities. Longitudinal autoregressive and fixed effects modeling techniques found that higher nonresident father involvement predicted subsequent decreases over time in adolescent delinquency, particularly for youth with initial engagement in delinquent activities. Adolescent delinquency did not predict subsequent changes over time in father involvement. However, the two factors co-varied over time: as adolescent delinquency increased, so too did father involvement, suggesting that nonresident fathers may increase their involvement in the face of adolescent problem behavior, with this pattern driven primarily by African American families.

Keywords: father involvement, adolescent delinquency, fixed effects models, bidirectional parent-child relations, transactional theory, race/ethnic differences

Due to stably high divorce rates and increasing numbers of nonmarital births, a growing proportion of children in the U.S. are spending some or all of their childhood living apart from their biological fathers. These trends are troubling in light of consistent research results indicating that children in two biological-parent families develop more positively in a variety of realms, including lower engagement in problem behavior and delinquency (McLanahan & Sandefur, 1994). Yet not all single-mother homes are alike in the realm of paternal involvement. Extant research indicates significant variability in nonresident fathers' involvement with their children (Hofferth, Pleck, Stueve, Bianchi, & Sayer, 2002; Lerman & Sorensen, 2000), with some nonresident fathers sustaining contact, parental responsibility, and a close relationship with their children, and others providing intermittent or nonexistent parenting involvement. Given these differences, there is substantial research interest in understanding how nonresident paternal involvement is related to children's developmental well-being. In the current research we employ transactional theories of development to assess bidirectional, longitudinal relationships between nonresident father involvement and adolescent delinquency. In particular, we assess whether father involvement is predictive of change over time in delinquent activity among youth, and whether this link is moderated by initial levels of delinquency. We also assess whether adolescent delinquency is predictive of change over time in father involvement, and whether this varies by initial levels of involvement. Finally, in relation to growing ethnic diversity in families in the U.S. and to indications that family processes may show similarities as well as differences across cultural environments, we assess whether race/ethnicity moderates the relationship between father involvement and adolescent delinquency.

Nonresident Father Involvement and Adolescent Delinquency

A substantial body of research suggests that youth in single mother homes engage in higher levels of delinquency, such as drug and alcohol use, violence, illegal activities, and school truancy and problem behaviors, than their counterparts in married families (Demuth & Brown, 2004). Some of these differences appear due to individual and structural differences that select parents into or result from single-parent status, such as lower levels of education and income, or less supportive maternal parenting. But research also indicates that paternal involvement may affect the divergent trajectories of children raised with and without their biological father in their home (Carlson, 2005; Demuth & Brown, 2004). Numerous studies have shown a link between nonresident fathers' involvement and lower levels of adolescent problem behaviors (e.g., Carlson, 2005; Demuth & Brown, 2004; Furstenberg & Harris, 1993). In a meta-analysis of 63 published studies, Amato & Gilbreth (1999) found that nonresident fathers' authoritative parenting practices, such as a close relationship and participation in parenting responsibilities, decisions, and discipline, was a stronger correlate of children's well-being than other aspects of nonresident father contributions, such as financial support or adolescent perceptions of paternal warmth. Fathers' provision of care and discipline might help to decrease problem behavior in youth due to facilitation of their sense of trust and competence, heightened expectations for proper behavior which support self regulation, and provision of monitoring and oversight which decreases opportunities for problem behaviors (Baumrind, 1968).

Although studies are increasingly using large and representative data sets, controlling for important correlates, and attempting to incorporate more sophisticated measures of father involvement, a number of methodological weaknesses remain in the literature on nonresident father parenting (Amato & Gilbreth, 1999; Coley, 2001). One such problem is shared method variance driven by a single reporter for the primary variables of interest. In addition, many

extant studies are cross-sectional, and thus fail to establish direction, temporal precedence, or developmental trajectories. Albeit lacking a statistical lever to determine the direction of effects, most such studies presume that father involvement influences adolescent functioning. However, central theories of development indicate the need for a bidirectional and more sophisticated model of father involvement and adolescent problem behavior.

Transactional Models of Parenting and Child Development

Transactional models of parenting and child development presume bidirectional relations between parents and children (Bell, 1968; Sameroff, 1975). Such models argue for reciprocal relationships in which children both are influenced by parents' behaviors and elicit particular behaviors from parents. In the vast body of research on parenting and child development, only a small proportion of studies have taken a transactional approach (Crouter & Booth, 2003; O'Connor, 2002). A prominent exception is research on the development of delinquency and conduct disorder, in which multiple research and statistical methods are being used to assess bidirectional parent-child relations (e.g., Anderson, Lytton, & Romney, 1986; Jaffee et al., 2004). Dishion and colleagues (Dishion, Nelson, & Bullock, 2004; Dishion, Poulin, & Medici Skaggs, 2000) have proposed a bidirectional model they term "premature autonomy," in which early adolescents pull away from parents towards deviant behaviors and peers while parents disengage from providing oversight and management. Also referred to as an abdicating model of parenting (Patterson, Reid & Dishion, 1992), parental disengagement in the face of adolescent problems allows adolescents the opportunity to engage in more delinquent behaviors, which in turn may further erode effective parenting (see also Laird, Pettit, Bates, & Dodge, 2003; Reuter & Conger, 1998). Other researchers assert that the pathway from children to parents is the most

influential, claiming that adolescent problem behavior predicts parents' knowledge much more strongly than parenting predicts adolescent behavior (Jang & Smith, 1997; Kerr & Stattin, 2003).

Children Influencing Nonresident Fathers

In this rich body of research on parenting and adolescent delinquency, "parenting" is nearly always operationalized using measures focused solely on mothers or on parents as a unit, failing to independently assess fathering. Beyond age and gender, and some attention to young children's temperament, research rarely has assessed whether children's characteristics or behaviors influence father involvement or parenting practices. Given indications that fathers' behaviors may be more influenced by contextual factors than mothers' (Doherty, Kouneski, & Erickson, 1998), this omission is noteworthy. Nonresident fathers, who show greater variability in involvement with their children than resident fathers, may be particularly influenced by child factors. Some research suggests that nonresident fathers increase their involvement when their children are adolescents (Furstenberg & Harris, 1992). With greater freedom and maturity, adolescents may be better able to initiate increased contact and involvement with their nonresident fathers. Or perhaps fathers increase their involvement as children reach developmental stages in which risk-taking behaviors become more common or mothers' parenting is less effective (Ihinger-Tallman et al., 1993). For example, a recent analysis of AddHealth data found that adolescents who more often discussed personal problems with their nonresident fathers reported higher delinquency and emotional distress, suggesting that either fathers or adolescents may initiate more discussions when adolescents are experiencing problems (Stewart, 2003). Historical views of fathers as disciplinarians might be called upon, with fathers becoming more involved if children show problematic behaviors. This argument conflicts with

Dishion and colleagues' (2000, 2004) transactional models of delinquency, which argue that parents become less involved in the face of adolescent problem behavior.

Nonlinearities in Transactional Relationships

Transactional models also move beyond simple bidirectional relationships to incorporate nonlinearities or interactive relationships. For example, Bell's (1971; Bell & Chapman, 1986) control systems model purports that it is when an individual approaches an "upper limit" of tolerated behavior that another individual's corrective reaction may be solicited. If this corrective reaction is appropriately controlling and supportive, the path of problem behavior may be altered. That is, adolescent delinquency may need to increase to a certain upper level before it elicits a reaction. An appropriate parental reaction may help youth to deviate from pathways of increasing problem behavior, while a less appropriate parental response may exacerbate the trajectory. Dishion and colleagues (2004) found support for this interactive model, reporting that declines in parenting quality (family management) over adolescence predicted increased adolescent delinquency only among youth who were already engaged in deviant peer processes. If one argues that nonresident father involvement may be protective for adolescents, and that nonresident fathers may react to adolescent delinquency by increasing their involvement, this interactive model suggests that father involvement may be most influential for adolescents showing an early proclivity towards delinquency. Moreover, this perspective suggests that relatively uninvolved fathers may increase their involvement in the face of high or rising adolescent delinquency.

Racial/Ethnic Variability in Fathering

It is also important to consider the cultural context in which fathering is embedded. Significant variability exists between racial/ethnic groups in the prevalence of single-mother

households and the level of nonresident father involvement. Nonmarital and nonresidential fathering is most common in the U.S. among African American families, and has grown dramatically in recent years among Latino groups as well (U.S. Department of Health and Human Services, 1999). Yet among unmarried fathers, African American men are most likely to sustain contact with their children when they do not coreside (Edin & Kefalas, 2005; Lerman & Sorensen, 2000), perhaps related to the longer history and more ingrained norms of nonmarital childbearing and nonresidential fathering (Coley, 2001) or to greater gender equality (King, Harris, & Heard, 2004) within this cultural community. Furthermore, research suggests that nonresident African American and Latino fathers may be more involved than their white counterparts in areas of parental involvement such as decision-making and discussions with their adolescents (King, et al., 2004; Seltzer, 1991).

However, differences in levels of involvement does not equate to differences in links between father involvement and child well-being. Research concerning differential links between parenting and children's behavior problems or delinquency are mixed, with some studies finding consistency across racial/ethnic groups (e.g., Eamon, 2001; Forehand, Miller, Dutra, & Chance, 1997), and others finding differences, with more controlling parenting linked to lower problem behaviors for African American (e.g., Deater-Deckard, Dodge, Bates, & Pettit, 1996; Walker-Barnes & Maso, 2001) and Latino (Lindahl & Malik, 1999) families but not for European Americans, although these studies did not explicitly assess fathering. As McLoyd and colleagues (McLoyd, Cauce, Takeuchi, & Wilson, 2000) argued in a recent review, extant research is inadequate to form clear conclusions regarding parenting differences across cultures, and almost no research has directly assessed these questions in regards to father involvement. Finally, research in this arena has not taken a transactional view, assessing potential effects of

children on parents. Hence, there is a substantial need for continued rigorous empirical assessment of whether father involvement and adolescent well-being are differentially linked across racial/ethnic groups in the U.S.

Research Goals

The current study seeks to assess transactional relations between nonresident father involvement and early adolescents' engagement in delinquency. Attending to a number of methodological weaknesses identified in past research, this study uses two reporters; controls for a number of central individual and family correlates including adolescent and maternal characteristics, economic resources, and maternal parenting; follows respondents prospectively over a 16 month period; and employs two different statistical techniques (described in detail below) to attempt to tease apart directionality and both short- and longer-term relationships between father involvement and adolescent delinquency. Specifically, we hypothesize that (1) nonresident father involvement will show prospective and concurrent links with changes in adolescent delinquency, and (2) adolescent delinquency will show prospective and concurrent links with changes in nonresident father involvement. Based upon transactional theory, we also predict that (3) the aforementioned relationships will act in an interactive fashion, differing by initial levels of involvement and delinquency. We also assess (4) whether relationships between father involvement and adolescent delinquency differ for adolescents from different racial/ethnic backgrounds, although specific hypotheses are not delineated.

Method

Sample

Data are drawn from a subsample of families from *Welfare, Children, and Families: A Three-City Study*, a longitudinal study of the well-being of low-income families and

communities in the wake of welfare reform. In addition to other components, the Three-City Study contains two waves of survey data from a stratified, random sample of over 2,000 low-income children and adolescents (ages 0-4 years and 10-14 years in wave 1) and their mothers in low-income neighborhoods in Boston, Chicago, and San Antonio. In 1999, over 40,000 households in randomly selected low-income neighborhoods (93% of block groups selected for sampling had a 20% or higher poverty rate) were screened, with a screening response rate of 90 percent. Eligible families, determined by income status (200% or less of the poverty line) and the presence of a child between the ages of 0 to 4 or 10 to 14 years with a resident primary female caregiver, were invited to participate based upon a stratified probability sampling framework. Over 90% of the caregivers were biological mothers, and hence we refer to all as “mothers.” Within each participating family, one focal child was selected using equal probability sampling. Eighty-three percent of selected families agreed to participate, resulting in an overall response rate of 74 percent. A second wave of interviews was completed with 88 percent of these families 16 months later, on average, in 2001. For further details on sampling criteria and data collection see Winston et al. (1999).

For the current analyses, the sample consists of early adolescents (age 10 to 14 in wave1) who participated at both waves, reported that their father was alive at wave 1 and wave 2, did not reside with their biological father at wave 1, and had valid data on all included variables ($N = 647$). Of the adolescents with nonresidential fathers at wave 1, 11% did not participate in the second wave, 8% reported that their father was not alive by wave 2, and 17% had missing data on some or all of the central variables included in the analyses. Attrition analyses were conducted to assess differences between adolescents and families with nonresidential biological fathers at wave 1 who were and were not included in the final sample. The excluded adolescents

lived with fewer minors in the home ($t(963) = 3.46, p < .05$) and had older mothers ($t(667.23) = 2.77, p < .01$) with less education ($t(960) = -2.21, p < .05$). A higher proportion of this group had families on welfare ($t(728.47) = 2.19, p < .05$) and a father figure other than their biological father ($t(748.84) = 2.91, p < .01$), while a lower proportion of these adolescents were white ($t(900.87) = -2.21, p < .05$). Additionally, excluded adolescents had lower levels of anger ($t(290.80) = -3.38, p < .01$) and higher levels of trust toward their father at wave 1 ($t(782) = 2.14, p < .05$), and lower father involvement at wave 1 ($t(138.07) = -10.65, p < .001$). These differences suggest that excluded adolescents were slightly more disadvantaged than the included sample. It is important to note that the use of probability weights in all analyses adjust the sample for nonresponse as well as for the sampling strategy, and hence make the sample representative of early adolescents with nonresidential biological fathers in low-income families living in low-income neighborhoods in Boston, Chicago, and San Antonio.

Data Collection

Professional, experienced interviewers conducted 30 minute in-person interviews with each focal adolescent in which adolescents provided information about their emotional and behavioral functioning, schooling, and interactions with their parents. Mothers participated in separate 2 hour in-person interviews covering topics concerning welfare and employment, family functioning, and child well-being. Due to the commonality of single-mother households and the difficulty of accessing fathers, the presence of biological fathers or male caregivers was not a sampling criterion, and fathers of adolescents were not interviewed. Interviews were translated (and verified with back-translations) into Spanish, and this version was used by approximately 2% of adolescents and 12% of mothers who reported their primary language as Spanish. All respondents were paid for their participation in the study.

Measures

Extant research identifies a number of child, mother, and family characteristics which have been shown both to select families into particular family structures and patterns of father involvement and to influence the development of problem behaviors among adolescents in low-income families (see Nelson, 2004; Patterson et al., 1992). In order to decrease the likelihood of spurious findings, it is important to partial out the influence of these characteristics from the central relationship of interest between nonresident father involvement and adolescent delinquency. Hence, all of the following child and family characteristics were included in analyses as covariates.

Covariates. Demographic characteristics of adolescents, mothers, and families were drawn from wave 1 mother reports. Adolescent characteristics include: age, coded in months; months between the first and second wave (to control for differential time lapses between waves); gender (1 = male, 0 = female); and race/ethnicity, which is coded with dummy variables designating African American (= 1; else = 0) and European American/other (= 1; else = 0). Mothers also reported on whether someone other than the biological father acted as a father figure to the adolescent (father figure = 1, no father figure = 0). Mother characteristics include: relationship to the adolescent (biological mother = 1, other = 0); maternal age in years; marital status, coded as dummy variables indicating currently married (= 1; else = 0) and currently cohabiting (= 1; else = 0); and education level, measured on a 1 (*less than a high school degree*) to 8 (*graduate degree*) scale. Mothers also reported on their welfare status (1 = welfare, 0 = not welfare); their employment status (1 = employed, 0 = not employed); and the number of minors under the age of 18 living in their home. A household income to needs ratio was calculated for each family by comparing the total monthly income (including food stamps) from all family

members to the poverty standards for a household of the appropriate size. Two dummy variables indicating the city in which the family resided (Boston = 1, else = 0 and Chicago = 1, else = 0) were also included as covariates.

Adolescent perceptions of closeness with their mothers and with their fathers were measured and included in analyses in order to differentiate the influence of father involvement from the emotional attachment of adolescents to their parents. During the wave 1 interview, adolescents responded to subsets of items from Armsden and Greenberg's (1987) Inventory of Parent and Peer Attachment (IPPA), a measure designed to assess the affective and cognitive dimensions of adolescents' relationships with their parents and their friends. Adolescents responded to the same set of questions in reference to their mothers and their fathers. Previous research has indicated strong internal and test-retest reliability and convergent and construct validity for the IPPA (Armsden & Greenberg, 1987). Based on previous research with low-income African American adolescents (Coley, 2003; Pittman & Chase-Lansdale, 2001), two subscales were formed. The subscale of Trust and Communication is used to assess adolescents' perceptions of the responsiveness, accessibility, and warmth of their fathers and mothers. This scale is comprised of the mean of 6 items ($1 = \text{never true}$ to $5 = \text{always true}$; e.g., I tell my father about my problems and troubles; When we discuss things, my father cares about my point of view; $\alpha_{\text{mother}} = .74$ and $\alpha_{\text{father}} = .90$). The subscale of Anger and Alienation is used to assess adolescents' feelings of resentment toward and alienation from their fathers and mothers. This scale is comprised of the mean of 6 items ($1 = \text{never true}$ to $5 = \text{always true}$; e.g., I feel angry with my mother; My mother doesn't understand what I'm going through these days; $\alpha_{\text{mother}} = .60$ and $\alpha_{\text{father}} = .66$). Correlations between adolescent reports of relationships with mothers and fathers were moderate, ranging from .22 to .42 (all $p < .001$).

Father Involvement. Information on father involvement was collected from adolescents and mothers at both waves of the survey. Adolescents reported the amount of physical contact (In the past 12 months, how often have you seen your father?) and communication (In the past 12 months, how often have you talked to your father on the phone or communicated in other ways when you weren't with him?) they had with their fathers during the previous year (1 = never, 2 = not in past year, 3 = few times, 4 = every few months 5 = once a month or more, 6 = once a week or more, 7 = almost every day, and 8 = father is in the household). Mothers reported on adolescent-father contact and communication as well. Mother and adolescent reports of contact and communication were highly correlated, with Pearson correlations ranging from .68 to .80 (all $p < .001$). Mothers also responded to two items assessing the amount of responsibility the adolescent's father took in response to basic needs (How much responsibility does [father] take in [adolescent's] daily care, such as preparing food for [adolescent], or making sure [he/she] goes to school?) and discipline (How much responsibility does [father] take for making sure [adolescent] behaves?) on a scale from 1 = no contact with father, 2 = none, 3 = some, and 4 = all of the responsibility.

To create a multiple-reporter composite, and because at this developmental stage with greater autonomy adolescents were thought to be more valid reporters than mothers of contact with nonresident fathers, adolescent reports of contact and communication were combined with mother reports of father responsibility. The four items were strongly correlated, and factor analyses yielded one factor at each wave. Items were standardized and averaged to yield a single score of fathers' instrumental involvement for each wave, with very strong internal consistency ($\alpha_{T1} = .90$; $\alpha_{T2} = .91$). To assess cultural equivalence of measurement, factor structure and internal reliabilities of the father involvement measure were also assessed separately by

adolescent racial/ethnic group. Results showed similar factor structures and strong reliability across groups ($\alpha_{\text{AfricanAmerican}} = .90, .89$; $\alpha_{\text{Hispanic}} = .90, .92$; $\alpha_{\text{White/other}} = .91, .92$).

Adolescent delinquency. Adolescents reported on their engagement in problem behaviors using the Automated Computer Assisted Survey Interview (ACASI) method which has been shown to improve the validity of reporting on sensitive topics (Turner et al., 1998). Adolescents completed a scale of engagement in problem behaviors, containing sixteen items from the National Longitudinal Study of Youth NLSY; Borus, Carpenter, Crowley, & Daymont 1982) and the Youth Deviance Scale (Gold 1970; Steinberg et al., 1991), previously used in research with low-income minority adolescents (Coley & Chase-Lansdale, 2000; Pittman & Chase-Lansdale, 2001). Items assessed adolescent engagement in delinquent behaviors, including actions such as stealing, damaging property, alcohol use, drug use, cheating in school, and school detention in the past year on a 1 (never) to 4 (often) scale. Items were standardized, averaged, and then transformed by taking the natural log to correct for skewness. Higher scores represent greater engagement in delinquency ($\alpha_{\text{wave1}} = .71$; $\alpha_{\text{wave2}} = .84$). Internal reliabilities run separately by racial/ethnic group showed similar results for African American and Hispanic youth, with lower internal consistencies for the small group of white/other youth ($\alpha_{\text{AfricanAmerican}} = .70, .85$; $\alpha_{\text{Hispanic}} = .68, .92$; $\alpha_{\text{White/other}} = .57, .59$).

Adolescent reports of delinquency were chosen because youth were deemed to be the most reliable reporters of these types of behaviors, of which parents and teachers may not be aware. It is typical in extant research to use self reports of delinquent behaviors during adolescence and parent or teacher reports during younger childhood, and adolescent reports have been found to have decent agreement with parent, police, and administrative reports of criminal or problem behaviors (e.g., Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). Adolescent and

parent reports of delinquency are typically moderately correlated, with reported correlations ranging from .26 to .43 in two recent studies (Laird et al., 2003; Moffitt et al., 1996), and some suggest that parent reports become less valid over time as adolescents become more autonomous and spent greater time outside of their parents' direct control and monitoring (Laird et al., 2003). In the current study, mothers also reported on youth behaviors using the Child Behavior Checklist (CBCL, Achenbach, 1991). Adolescent reports of delinquency and mother reports from the delinquency subscale of the CBCL showed correlations of .36 and .45 ($p < .001$) at waves one and two, respectively, very similar to inter-rater reliability in previous studies.

Analytic Techniques

To assess longitudinal and transactional relationships between nonresident father involvement and adolescent delinquency, two types of longitudinal, multivariate regression models are employed, with multiple variants. All models assess changes in adolescents' engagement in delinquency or changes in father involvement over an approximately one and a half year period, producing a stronger developmental focus than point-in-time estimates. Similar research has found a one to two year period to be an adequate time frame to measure change in adolescent problem behavior (e.g., Coley et al., 2004; Eccles & Barber, 1999; Pettit et al., 1999; Reuter & Conger, 1998). All models also control for the adolescent and family demographic, economic, and relationships correlates discussed above, which are likely to be related to both father involvement and adolescent delinquency. Still, determining causation in non-experimental data is difficult due to omitted variable bias and bidirectionality issues. To control for such bias, as well as more carefully assess directionality, two different analytic models with variant strengths are employed: lagged OLS regression models with time varying predictors and individual fixed effects regression models.

The first set uses a lagged OLS regression model, or residualized change model, typical of developmental work. This model takes the following form:

$$\text{Model 1A: Adolescent Delinquency}_{2i} = B_0 + B_1 \text{Adolescent Delinquency}_{1i} \\ + B_2 \text{Father Involvement}_{1i} + B_3 \Delta \text{Father Involvement}_{1-2i} + B_4 \text{ChildFamily}_{1i} + \epsilon_i$$

This technique models adolescent delinquency at Time 2 as a function of father involvement at Time 1 as well as changes in father involvement by Time 2, controlling for adolescent delinquency at Time 1. A series of adolescent and family factors that may be associated with both adolescent functioning and father involvement are included in the models as covariates, thus capturing selection effects that are tapped into by these measured variables. Controlling for adolescents' initial engagement in delinquency, this model controls for unmeasured differences in adolescents that have a consistent effect on the outcome variable of interest (such as a genetic proclivity toward problem behavior). This model presumes that father involvement changes over time, and further that father involvement at Time 1 and at Time 2 will have distinct effects on adolescent delinquency. The coefficient B_2 is interpreted as a time-lagged or "longer term" effect of father involvement on changes in delinquency over time, while B_3 is interpreted as a "short term" effect of father involvement (Kessler & Greenberg, 1981). This model can not control for unmeasured variables that differentially affect adolescent delinquency over time, although such variables would only bias the results if they were also correlated with father involvement (Cronbach & Furby, 1970; NICHD and Duncan, 2003).

The second model employs fixed effects techniques which control for correlates that change over time while differencing out all time-invariant characteristics.

$$\text{Model 2A: } \Delta \text{Adolescent Delinquency}_{1-2i} = B_0 + B_1 \Delta \text{Father Involvement}_{1-2i} + B_2 \Delta \text{Child Family}_{1-2i} + \varepsilon_i$$

In an individual fixed effects model, all variables in the model are differenced, such that time invariant variables drop out of the model. In short, a fixed effects model controls for all time invariant unmeasured variables that have a persistent effect on the dependent variable of interest. However, the fixed effects model does not directly model initial levels of the dependent variable, and it assumes an immediate, or short term, effect. Moreover, presuming that repeated measures of the same construct are correlated, change scores are less reliable than the original measures (Cronbach & Furby, 1970), hence increasing the standard errors of the parameter estimates in the fixed effects model (NICHD & Duncan, 2003).

These two modeling techniques are also employed to estimate the effect of adolescent delinquency on changes in father involvement over time, simply by switching the two constructs in the models delineated above (models 3A and 4A). By comparing results over the two sets of models, this paper seeks to assess both short and longer term effects of father involvement on adolescent delinquency, and of adolescent delinquency on father involvement, controlling for a host of child and family characteristics that are likely to select families into particular patterns of involvement and behaviors. To assess race/ethnicity moderation and nonlinear effects hypothesized by transactional theory, interaction terms are entered into the models, described in greater detail in the results.

Results

Sample Descriptives

Weighted sample descriptives are presented in Table 1. As noted, use of the probability weights make the sample representative of adolescents with nonresident fathers in low-income

families in low-income neighborhoods in Boston, Chicago, and San Antonio. Adolescents averaged 12½ years of age in wave 1, and just under half were boys. Representing adolescents in inner-city neighborhoods of the three cities, 53 percent of the adolescents were African-American, 38 percent were Hispanic (primarily Mexican-American, followed by Puerto Rican, Dominican-American, and other Latino ethnicities), and 9 percent were non-Hispanic white and other ethnicities. Mothers averaged 37 years old. Most of the families were poor, with an average income that put them below the federal poverty line (mean income-to-needs = .88). Mothers' average education level was just over a high school degree. Just under one third of the mothers received welfare and 45% were employed.

To help interpret the standardized father involvement and delinquency variables, these constructs were also assessed using their original response categories (data not in table). Adolescents reported contact or communication with their fathers every few months on average at both the first ($M = 3.97$, $SD = 2.96$) and the second ($M = 3.88$, $SD = 2.01$) waves, with substantial inter-individual variation. At wave 1, for example, 36 percent of adolescents had not had contact with their fathers in the previous year, whereas 32 percent reported having contact with their father once a week or more often. Mothers' reports of father responsibility were also consistent across the two waves, with an average score indicating very limited responsibility at both waves ($M = 1.86$, $SD = .81$; $M = 1.84$, $SD = .79$). There were no race/ethnicity differences, with African American, Latino, and White/other youth having similar levels of father involvement at both waves. The wave 1 and wave 2 father involvement composites were correlated at .68, $p < .001$, showing both a substantial level of continuity as well as intra-individual variation. Interestingly, correlations between father involvement and adolescent

delinquency were not significant at wave 1 ($r = -.01$, ns) or wave 2 ($r = -.04$, ns), indicating independence between these two constructs when considering them at a point in time.

Using the original response categories on the delinquency items, the mean delinquency scores at wave 1 ($M = 1.20$, $SD = .22$) and wave 2 ($M = 1.24$, $SD = .33$) showed that on average, adolescents reported engaging in delinquent activities never to once or twice a year, again showing little change across waves in the sample mean. African American adolescents reported lower levels of delinquency than did Latinos at wave 1 ($p < .001$), and lower levels than both Latinos ($p < .05$) and White/others ($p < .05$) at wave 2. The delinquency composites were correlated .50 across waves, lower than the continuity of father involvement, but still indicating substantial intra-individual continuity as well as change.

To put these data into a broader perspective, rates of delinquency in this sample were also compared to national norms. Comparing the 12 to 14 years olds in the current sample to those in the nationally representative NLSY97 sample revealed that adolescents in the current sample reported slightly lower levels of cigarette, alcohol and marijuana use (e.g., 97% of adolescents in the current sample reported no marijuana use compared to 95% in the NLSY97) and slightly higher rates of property crimes (e.g., 79% of adolescents in the current sample reported no property damage compared to 85% in the NLSY97) than did adolescents nationally.

Predicting Changes in Adolescent Delinquency

The first panel of Table 2 presents results of the two lagged plus change main effects model specifications, with models predicting adolescent delinquency shown in the first column, and models predicting father involvement in the second column. Results indicate that higher father involvement in wave 1 predicts relative decreases in adolescent delinquency by wave 2, controlling for delinquency at wave 1 and a host of child and family correlates. This result

shows a moderate sized effect, with one unit change in father involvement predicting nearly one-fifth of a standard deviation change in delinquency. However, results also show a small significant positive coefficient on the change in father involvement from wave 1 to wave 2, indicating that as father involvement increases over time, so too does adolescent delinquency. The fixed effects model presented in Table 3 replicates this finding, with a statistically significant and positive relationship between changes in father involvement and changes in adolescent delinquency, with a small effect size.

Predicting Changes in Father Involvement

Although father involvement in wave 1 predicted a relative decline in adolescent delinquency over time, the reverse was not supported. Results in the second column of Table 2 indicate no longer-term or lagged effect of adolescent delinquency at wave 1 on changes in father involvement after controlling for involvement at wave 1. As found above, however, the two constructs covary over time. In both the lagged plus change model (2A in Table 2) and the fixed effect model (4A in Table 3), there are significant positive coefficients for the change in delinquency predictor, indicating that as adolescent delinquency changes over time, father involvement changes in the same direction.

Robustness Checks

A number of robustness checks were conducted, which replicated this pattern of results regardless of whether or not models controlled for mothers' marital status, identification of an alternate father figure, and teens' perceptions of emotional attachment relationships with mothers and fathers. Results were also consistent if the adolescents who reported no contact with their fathers in the past year (36% of the sample) were excluded from the models. As alternate model specifications to the lagged plus change regression models, models were run substituting the

wave 2 level of the predictor for the change score (e.g., Model 2B: Adolescent Delinquency_{2i} = $B_0 + B_1 \text{Adolescent Delinquency}_{1i} + B_2 \text{Father Involvement}_{1i} + B_3 \text{Father Involvement}_{2i} + B_4 \text{ChildFamily}_{1i} + \varepsilon_t$). Models were also run removing the change scores altogether, only including lagged wave 1 predictors. Again, results showed the same pattern. Finally, additional modeling indicated that the results were not moderated by adolescent gender; that is, the relationships between father involvement and adolescent delinquency were statistically similar between boys and girls.

Race Interactions

The next set of results, shown in the second panel of Table 3, present race interactions to assess whether the relationships between father involvement and adolescent delinquency are moderated by adolescents' race or ethnicity. To assess whether the main patterns of findings differed by racial/ethnic group, the two race dummy variables (one designating African American youth and one designating White/other youth) were interacted with the father involvement variables in model 2A and with the delinquency variables in model 2B. In all the interaction models, interaction terms were added to the existing models, which included both control variables and main effects of father involvement and adolescent delinquency. However, only the interaction terms themselves are presented in Panels 2 through 5 of Table 2.

Results indicate that the main effect of greater father involvement wave 1 predicting a decrease in delinquency wave 2 was not moderated by adolescent race/ethnicity. Two patterns of significant interactive results did emerge. First, although there was no significant main effect of adolescent delinquency wave 1 on father involvement wave 2, there was a significant interaction between White/other and delinquency wave 1. Results, graphed in Figure 1, indicate that the null main effect masked a significant positive effect for White/other youth. In short, for

this group greater delinquency in wave 1 predicted a significant increase over time in father involvement. Given the small size of the White/other group (weighted $n = 56$), some caution is urged in interpreting this finding. The second pattern of significant interactions concerned the concurrent increases between father involvement and adolescent delinquency. Interactions between Black and change in father involvement predicted delinquency wave 2, and interactions between Black and change in delinquency predicted father involvement wave 2. These results, graphed in Figures 2 and 3, suggest that the concurrent change over time in father involvement and delinquency is different for African American than for Latino youth. In short, the significant positive relationship between increasing delinquency and increasing father involvement found in the main effects models is driven primarily by the African American youth in the sample.

Interactive Transactional Models

The final sets of models test the predictions of the transactional conceptual models discussed above. In the first set of interactions, presented in the third panel of Table 2, interactions between delinquency wave 1 and both father involvement wave 1 and change in father involvement were added to model 1A to assess whether initial delinquency moderated the link between father involvement and later delinquency. Results found a significant interaction between wave 1 involvement and wave 1 delinquency, graphed in Figure 4. This result suggests support for Bell's (1971) control systems model, showing that the lagged effect of higher father involvement predicting a relative decline over time in adolescent delinquency is driven by youth showing high initial delinquency. This relationship is not significant for youth without early engagement in delinquency. In the reverse of this model, with interactions between father involvement and adolescent delinquency predicting a change in father involvement, the

interactions were not significant. Adolescent delinquency did not predict changes over time in father involvement differentially depending upon the initial level of father involvement.

Two final sets of interactions are presented in the fourth and fifth panels of Table 2. These interactions assessed whether the co-occurrence of changes in delinquency and changes in involvement were moderated by the starting levels of each construct. Results were not significant. In short, an increase in father involvement predicted an increase in delinquency regardless of how involved the father was initially, and an increase in adolescent delinquency predicted an increase in father involvement regardless of youth's initial level of delinquency.

Summary

To summarize, results show support for five conclusions. First, results found that higher father involvement prospectively predicted a relative decrease over time in adolescent delinquency. Second, this finding was moderated by adolescents' initial level of delinquency, with the main effect of higher father involvement predicting a decrease in delinquency driven by youth starting at a relatively high level of delinquency wave 1. Third, in contrast, results found no lagged effect of adolescent delinquency wave 1 predicting a change over time in father involvement, except among white/other youth. For this later, small group, greater initial delinquency predicted a relative increase in father involvement by wave 2. Fourth, results found that father involvement and adolescent delinquency covaried over time: as youth increased their engagement in delinquency, fathers increased their involvement. This pattern was driven by the African American youth in the sample. Fifth, the covarying of delinquency and father involvement was not moderated by initial levels of either construct.

Discussion

The central tenets of transactional developmental theory purport a bidirectional system in which children both influence and are influenced by the relationships and contexts which surround them (Bell, 1968; Sameroff, 1975). Hence, within a family system, parenting behaviors are presumed to play a causal role in children's developmental trajectories, while at the same time, parents respond to and are affected by their children's characteristics and behaviors. This research sought to address the central issue of bidirectionality within the realm of understanding nonresident father involvement and early adolescents' engagement in problem behaviors in low-income urban families. As increasing proportions of men are living apart from their biological children, a growing body of research is seeking to understand the role of nonresident fathers in family systems and child development. Hence, this research sought to ask: (1) Does nonresident father involvement, defined as contact and responsibility for children's care and behavior, predict changes in adolescent engagement in delinquency? (2) Do nonresident fathers appear to respond to their adolescents' behaviors, increasing or decreasing their involvement in the face of adolescent engagement in delinquency? (3) Are these relationships interactive, depending upon the initial level of delinquency or of involvement? (4) And do these relationships differ for youth from different racial/ethnic backgrounds?

Results indicated that greater involvement by nonresident fathers predicted relative decreases over time in adolescent delinquency. Controlling for a variety of individual and family characteristics and adolescents' perceptions of emotional attachment to both mothers and fathers, and also controlling for adolescents' earlier levels of delinquency, results found that nonresident fathers who had more regular contact and conversations with their children and who took greater responsibility for their children's care and behaviors had adolescents who showed relative decreases over a 16 month period in their levels of delinquency and problem behavior. These

findings replicate previous research suggesting that supportive and authoritative involvement by nonresident fathers is linked to more positive and productive behavioral functioning by adolescents (e.g., Amato & Gilbreth, 1999), using more rigorous methodology than many previous studies. Moreover, interactive models suggest that this relationship is moderated by adolescents' initial levels of delinquency. In short, the protective result was driven by youth who showed early engagement in delinquent activities: for these youth, preexisting elevated father involvement predicted relative declines over time in problem behavior. This finding supports transactional theory suggesting that children's characteristics interact with their environments to influence later development.

In contrast, adolescent engagement in delinquency did not prospectively predict changes over time in father involvement for the sample as a whole: over a 16 month period, fathers of more delinquent adolescents showed, on average, neither relative increases nor decreases in father involvement, irrespective of their initial level of involvement. Hence, in this view of transactional relationships, results suggest that the influence of nonresident fathers to children may be significantly stronger than that of children to nonresident fathers. The exception to this finding was the small sample of white/other youth, for whom greater delinquency predicted an increase over time in father involvement. As recent scholarship highlights, the family lives of low-income unmarried parents are increasingly complex, with new partners and children adding a multitude of relationships and responsibilities that both parents and children must juggle (Lerman & Sorensen, 2000; Manning, Stewart, & Smock, 2003). Recent qualitative research with unmarried low-income parents underscores the depths to which criminal activity, violence, and infidelity, as well as economic insecurity, interfere with unmarried parents' ability to sustain stable and positive relationships (Edin & Kefalas, 2005). These forces and the resulting couple

conflict in turn drive fathers out of consistent and active roles in their children's lives. It may be that only under conditions of congenial parent relations and low alternative parenting responsibilities that nonresident biological fathers are called upon or volunteer to become more involved in the face of problematic behavior by children. Unfortunately, the current data set did not contain adequate data to test these possibilities. Future research efforts need to delve more deeply into the psychosocial and family process factors that support or prohibit fathers' continued connections to their children. Greater information in survey research concerning fathers' experiences in these realms is particularly lacking.

An alternative interpretation for the result that father involvement prospectively predicts changes in adolescent delinquency whereas delinquency does not prospectively predict changes in father involvement is that paternal responses to children, at least as measured here, unfold in a different time frame. As Bell's (1971; Bell & Chapman, 1986) control system model suggests, children's inappropriate actions or behaviors may solicit corrective reactions by parents. Such reactions may occur more immediately, rather than unfolding over time, and may have longer-term effects on trajectories of children's behaviors. This view is supported by the results showing concurrent changes over time in father involvement and adolescent delinquency. Whether the models predicted changes in involvement or changes in delinquency, the strength of the relationship was very similar and positive: as delinquency increased over time, so too did father involvement. This pattern appeared driven by the African American youth in particular.

As is typical in correlational studies, it is not possible to definitively determine the direction of causation, nor to control for all potential endogenous factors even with the extensive correlates and using the modeling techniques employed in this study. One possibility is that increasing father involvement leads to increases in adolescent delinquency. As adolescents reach

towards greater autonomy, perhaps an increase in oversight by a parent is counterproductive. A second possibility is that nonresident fathers respond not in a time-lagged, but rather in a more immediate manner, increasing their involvement in the face of escalating adolescent delinquency. In short, the perspective argues that nonresident fathers, particularly in African American families, may increase their involvement in the face of increases in youth problem behavior.

These findings stand in contrast to the premature autonomy (Dishion et al., 2004) and abdicating (Patterson et al., 1992) models of parenting which suggest that parents react to their children's problematic behaviors and peer connections by becoming less involved and thus allowing continued growth in problem behavior (see also Laird et al., 2003; Rueter & Conger, 1998). Kerr and Stattin (2003) argue that this negative relationship is due to adolescents' defiant and intimidating behaviors within the family, which discourage parental efforts at involved oversight, and lead to further problems among adolescents. In short, these studies suggest that adolescents who engage in negative and problematic behaviors within their family push their residential parents away.

In attempting to reconcile these conflicting findings, it is important to keep in mind the numerous differences in the samples and methodologies of the studies. Among other differences, the other studies focused on primarily white, lower- to middle-class, and predominantly two-parent families and considered parents as a unit rather than assessing fathers separately. Perhaps most pertinent is the possibility that nonresident parents may react differently to adolescents' problem behaviors, particularly illegal and antisocial activities such as drug use, theft, and school problems. Although extant research (conducted on primary middle class and European American samples) has found that nonresident fathers typically engage in recreational

and fun activities with their children, limiting their disciplinary and oversight parental roles (e.g., Demuth & Brown, 2004; Stewart, 2003), there are suggestions that African American and Latino fathers may be more involved than their White and Asian counterparts in decision-making and discussions with their adolescents (King, Harris, & Heard, 2004; Seltzer, 1991). The current research extends this finding, arguing that low-income nonresident fathers, particularly African American fathers, may increase their efforts at providing involved and responsible parenting when faced with escalating youth problem behaviors. African American fathers, faced with a history of discrimination and unequal intervention by the justice system (Garcia Coll et al., 1996; Patterson, 1998), may be more reactive to delinquent activities in their adolescents than middle-class advantaged parents.

Unfortunately, the Three-City Study data do not contain measures of specific paternal behaviors such as disciplinary actions or monitoring in order to explore further whether adolescent delinquency predicts changes in fathers' use of particular parenting techniques, or whether particular aspects of quality parenting are more or less influential in predicting adolescent delinquency. Very limited information was available about fathers' characteristics or family relationships outside of contact and responsibility for the adolescent. Finally, the data did not contain father reports on their involvement with their adolescents. Recent research shows strong cross-reporter correlations on father involvement, and is beginning to assess more sophisticated questions concerning whether different reporters of father involvement show variant reliability or validity (e.g., Coley & Morris, 2002; Hernandez & Coley, 2005; Smock & Manning, 1997). In depth information from fathers themselves may help to shed light on the circumstances under which they react to their adolescents' behaviors and needs. Increasing fathers' participation in research on children and family processes and increasing the specificity

of measurement on father involvement remains a central goal. The complexity of family relations, particularly in non-cohabiting parent families, calls for further in-depth exploration into the specific contributions of nonresidential fathers to family systems and to the support of healthy developmental trajectories among youth.

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Table 1. Means, Standard Deviations, and Ranges or Percents of Study Variables

	Wave 1			Change Score		
	<i><u>X or %</u></i>	<i><u>SD</u></i>	<i><u>Range</u></i>	<i><u>X or %</u></i>	<i><u>SD</u></i>	<i><u>Range</u></i>
Boston	37.9%					
Chicago	38.3%					
San Antonio	23.8%					
Bio mother	89.2%					
Caregiver age	37.44	7.77	18-74			
Caregiver ed.	4.31	2.25	1-8			
Married	9.9%			.06	.37	-1-1
Cohabiting	3.2%			.04	.26	-1-1
Income-to-needs	.88	.53	0-3.48	.20	.69	-3.48-3.19
Receiving welfare	31.9%			-.09	.45	-1-1
Employed	45.4%			.09	.55	-1-1
# Minors in home	3.18	1.59	1-8	-.21	1.22	-6-5
Male	47.1%					
Adol. age (months)	151.18	17.47	120-186	15.93	2.80	12-26
African American	52.6%					
White/Other	9.2%					
Hispanic	38.2%					
Father figure	44.5%					
Mother anger	2.44	.79	.33-4.83	-.10	.98	-2.83-3.00
Mother trust	4.20	.73	1-5	-.10	.80	-3.50-2.67

Father anger	2.58	.97	1-5	-.01	1.01	-3.33-3.67
Father trust	3.34	1.28	1-5	-.25	1.11	-3.60-3.83
Father Involvement	0	.91	-1.26-2.09	0	.71	-2.87-3.09
Wave 2 Involvement	0	.89	-1.20-2.32			
Delinquency	-.09	.33	-.37-1.80	.02	.38	-1.38-1.80
Wave 2 Delinquency	-.07	.41	-.37-1.76			

*Table 2. Lagged Plus Change Regression Models Predicting Adolescent Delinquency Wave 2
and Predicting Father Involvement Wave 2.*

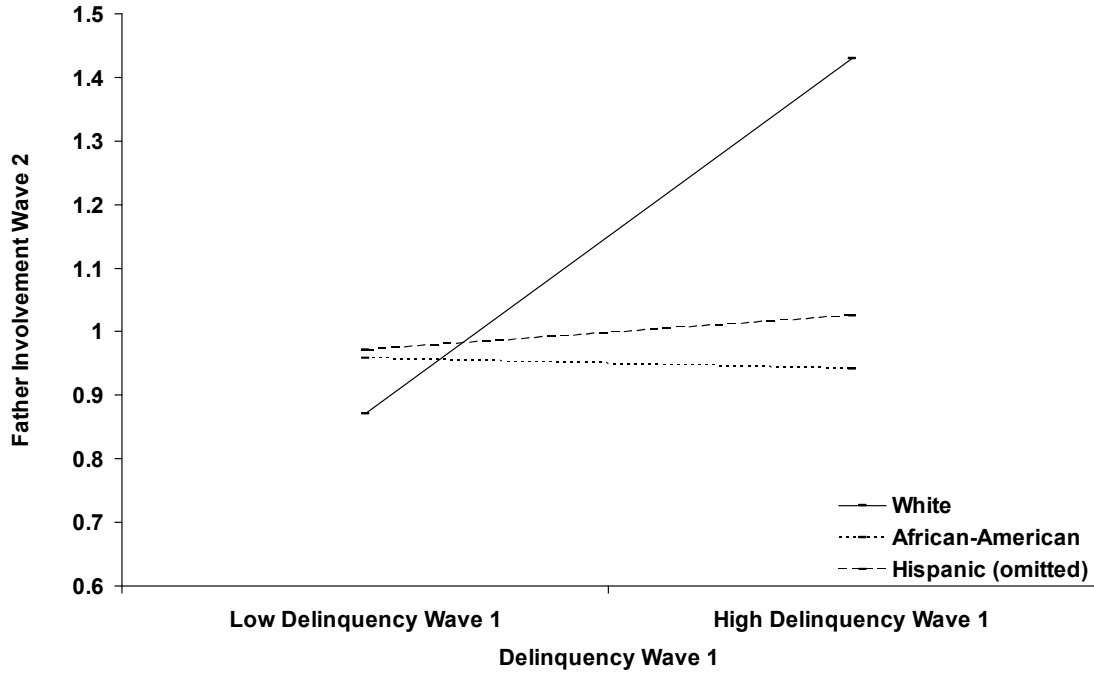
	<i>1A Predicting</i>		<i>2A Predicting</i>		
	<i>Delinquency₂</i>		<i>Involvement₂</i>		Adolescent-Father Reciprocity 41
	β	<i>Coeff(SE)</i>	β	<i>Coeff(SE)</i>	
Father Inv ₁	-.18**	-.08(.03)	.65***	.66(.06)	
Δ Father Inv ₁₋₂	.10*	.06(.03)			
Delinquency ₁	.47***	.58(.10)	.04	.11(.11)	
Δ Delinquency ₁₋₂			.09*	.22(.10)	
<u><i>Covariates:</i></u>					
Boston	-.11 ⁺	-.09(.05)	.01	.01(.10)	
Chicago	-.003	-.00(.06)	-.01	-.02(.11)	
Bio mother	.07	.09(.06)	.01	.04(.14)	
Caregiver age	.17*	.01(.00)	-.01	-.00(.01)	⁺ <i>p</i> < .10, * <i>p</i> < .05, ** <i>p</i> < .01, *** <i>p</i> < .001
Caregiver education	.04	.01(.01)	-.01	-.00(.02)	
Married	-.10*	-.14(.06)	.02	.07(.12)	
Cohabiting	.01	.03(.12)	-.05	-.23(.19)	
Income-to-needs	.11*	.09(.04)	-.03	-.05(.08)	
Receiving welfare	.01	.01(.04)	.10 ⁺	.19(.10)	
Employed	-.09 ⁺	-.08(.04)	.08	.15(.09)	
# minors in home	-.05	-.01(.01)	-.07	-.04(.03)	
Male	.06	.05(.04)	.03	.05(.08)	
Adolescent age	.04	.00(.00)	-.03	-.00(.002)	
Δ Adolescent age	.11*	.02(.01)	-.01	-.00(.01)	
African American	.04	.03(.04)	-.03	-.05(.08)	
White/other	.10*	.13(.07)	.08	.22(.14)	
Father figure	.01	.00(.04)	-.05	-.08(.08)	
Mother anger	-.05	-.02(.03)	-.10*	-.11(.05)	
Mother trust	-.02	-.01(.03)	-.08 ⁺	-.10(.05)	
Father anger	.04	.02(.02)	-.05	-.05(.04)	
Father trust	.07	.02(.02)	.08	.06(.04)	

Table 3. Fixed Effects Regression Models Predicting Change in Delinquency and Change in Father Involvement

	3A Predicting		4A Predicting	
	Δ Delinquency		Δ Involvement	
	β	Coeff(SE)	β	Coeff(SE)
Δ Father Involvement ₁₋₂	.15*	.09(.04)		
Δ Delinquency ₁₋₂			.17*	.30(.12)
<u>Covariates:</u>				
Δ Married	.01	.01(.05)	-.10	-.17(.12)
Δ Cohabiting	.03	.04(.07)	.09	.21(.15)
Δ Income-to-needs	-.12*	-.07(.03)	.04	.04(.06)
Δ Receiving welfare	.09 ⁺	.07(.04)	-.01	-.02(.08)
Δ Employed	.04	.03(.04)	-.09	-.11(.09)
Δ # minors in home	.11*	.03(.01)	.03	.02(.03)
Δ Adolescent age	.09 ⁺	.01(.01)	.02	.00(.02)
Δ Mother anger	.21***	.08(.02)	.09	.06(.04)
Δ Mother trust	-.13**	-.06(.02)	.09	.08(.06)
Δ Father anger	-.01	-.01(.02)	.08	.05(.04)
Δ Father trust	-.08	-.03(.02)	.13*	.08(.03)
<i>F</i>	5.66***		2.38**	
<i>R</i> ²	.34		.09	

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

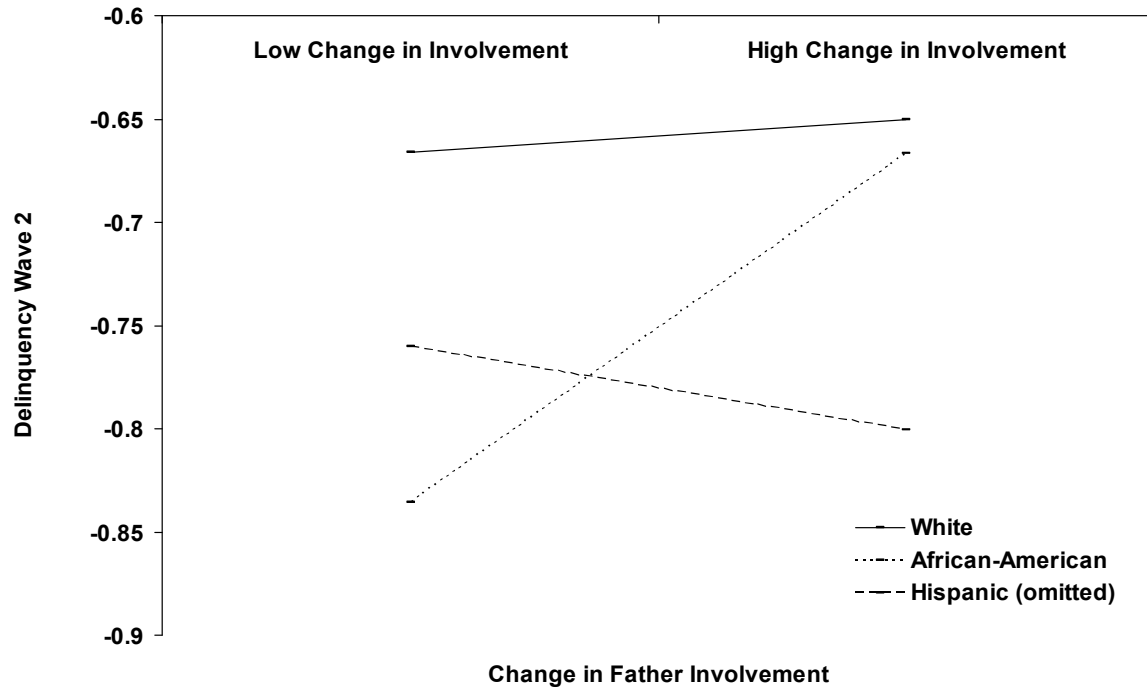
Figure 1. Interaction Between Race/Ethnicity and Wave 1 Delinquency Predicting Wave 2 Father Involvement.^{a,b}



^a For Delinquency, “low” indicates one standard deviation below the mean and “high” indicates one standard deviation above the mean.

^b Simple Slopes Tests: White $F(1,618)=13.73^{***}$, ns; African-American $F(1,618)=.03$; Hispanic $F(1,618)=.31$, ns

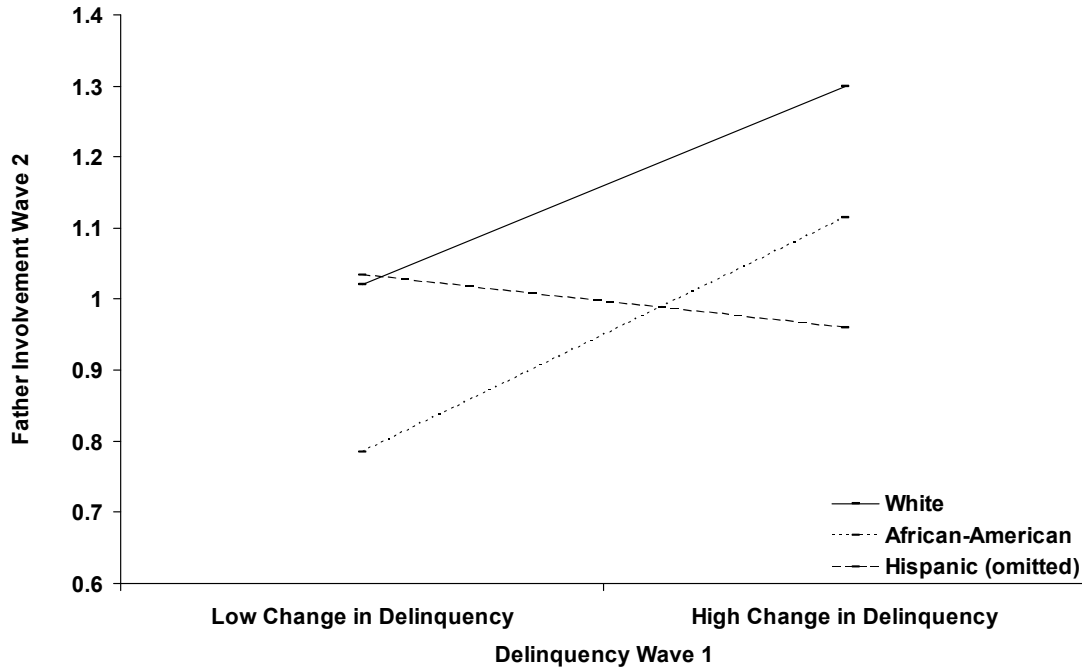
Figure 2. *Interaction Between Race/Ethnicity and Change in Father Involvement Predicting Wave 2 Delinquency.*^{a,b}



^a For both Change in Father Involvement and Delinquency, “low” indicates one standard deviation below the mean and “high” indicates one standard deviation above the mean.

^b Simple Slopes Tests: White $F(1,618)=1.81$, ns; African-American $F(1,618)=9.37^{**}$; Hispanic $F(1,618)=.59$, ns

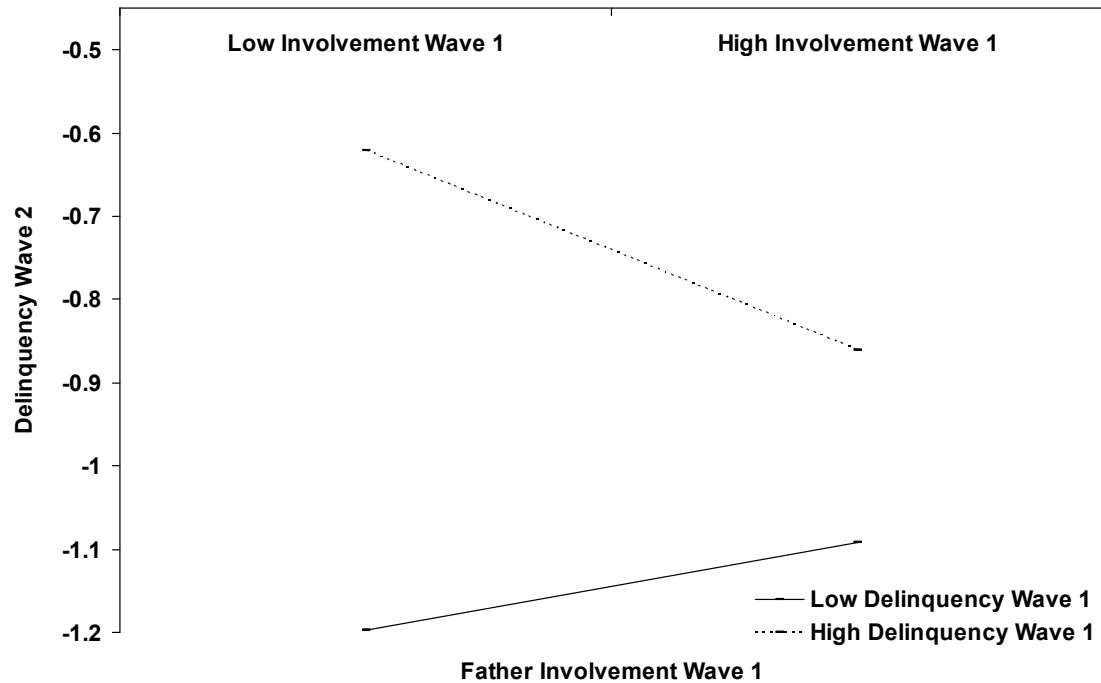
Figure 3. *Interaction Between Race/Ethnicity and Change in Delinquency Predicting Wave 2 Involvement.*^{a,b}



^a For both Change in Father Involvement and Delinquency, “low” indicates one standard deviation below the mean and “high” indicates one standard deviation above the mean.

^b Simple Slopes Tests: White $F(1,618)=1.80$, ns; African-American $F(1,618)=10.81^{**}$; Hispanic $F(1,618)=.76$, ns

Figure 4. Interaction between Wave 1 Delinquency and Wave 1 Father Involvement Predicting Wave 2 Delinquency.^{a,b}



^a For both Involvement and Delinquency, "low" indicates one standard deviation below the mean and "high" indicates one standard deviation above the mean.

^b Simple Slopes: Low Delinquency Wave 1 $B = .02$, $SE = .02$; High Delinquency Wave 1 $B = -.04^*$, $SE = .02$