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Changes in At-Risk American Men's Crime and Substance Use Trajectories Following Fatherhood

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Abstract

Fatherhood can be a turning point in development and in men's crime and substance use trajectories. At-risk boys (N = 206) were assessed annually from ages 12 to 31 years. Crime, arrest, and tobacco, alcohol, and marijuana use trajectories were examined. Marriage was associated with lower levels of crime and less frequent substance use. Following the birth of a first biological child, men's crime trajectories showed slope decreases, and tobacco and alcohol use trajectories showed level decreases. The older men were when they became fathers, the greater the level decreases were in crime and alcohol use and the less the slope decreases were in tobacco and marijuana use. Patterns are consistent with theories of social control and social timetables.

Keywords

alcohol; crime desistance; fathers; marijuana; marriage; tobacco

Fatherhood is a transition that many men experience as transformative (Laub & Sampson, 2003). However, the implications of fatherhood for men's health and development have received surprisingly little attention. This is no small matter given claims that unattached young men are responsible for much of the suffering and instability in society and that their behavior is tempered and redirected by family life (Popenoe, 1996). The impact of fatherhood on men's life course also informs understanding of fathers' impacts on child development, an active area of research (Lamb, 1997). Indeed, numerous studies, such as the Fragile Families and Child Wellbeing Study (e.g., Carlson & McLanahan, 2010), have demonstrated how at-risk men's characteristics and behaviors before and after the birth of their child can profoundly affect the context in which the child is raised.

Supplemental Online Information

Additional supporting information may be found in the online version of this article.

Appendix A is titled *Detailed Measurement Information for the Childhood Risk Construct;* Appendix B is titled *Fit Statistics and Unstandardized Parameter Estimates (Standard Error) for Predictors of Men's Behavioral Outcomes at Step 2 of Final Models.* These appendices are available at

http://www.oslc.org/appendices/jmf_fatherhood_oys_kerr.pdf.

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Crime and substance use are related behaviors that can have negative health and psychosocial consequences for men and their children (Odgers et al., 2007). These behaviors tend to peak in adolescence or young adulthood and then decline, yet, at the interindividual level, show relative stability (Farrington, 1986). In the present study, we use a counterfactual approach to examine whether a shift in the course of men's behaviors occurs following the birth of their first child. By prospectively following men's pre- and postfatherhood trajectories for much longer than has been done in prior studies, we are able to test two key aspects of change: relatively immediate change, as reflected by a level shift or decrease in the trajectory of the behavior, and accelerated change, as indicated by greater-than-expected decreases over time.

Whether men's trajectories change following key life transitions has rarely been studied, but is relevant to efforts to improve their health and social functioning. The transition to fatherhood may be a window of relative openness to change, and interventions timed accordingly may take advantage of effects of naturally occurring motivations. For example, community-based "responsible fatherhood" programs frame fatherhood as an opportunity to break with the past and adopt new definitions of masculinity (Roy & Dyson, 2010). Motivational interviewing with expectant fathers may be able to capitalize on increasingly salient reasons to reduce risky behaviors that threaten their families' future health and well-being. Attempts to intervene once fathers are less troubled by discrepancies between their entrenched risky behaviors and their goals for their family may be less successful.

Mechanisms of Influence of Fatherhood on Crime and Substance Use

Social control theory has been used to explain desistance from problem behaviors in early adulthood (Sampson & Laub, 1990). That is, parenthood may reduce criminal behavior by increasing pressure for social conformity, such as for employment, monogamous partnership, and provision of adequate housing and care for the child. As posited by theories of differential association and social learning, changes also may occur because fathers spend less time in social contexts that support crime and substance use. Indeed, having a child is linked to less time spent socializing with male peers who are not caring for children, less time in bars and clubs, more time with extended family, and increased participation in church, community service, and paid employment (Bachman et al., 2002; Labouvie, 1996). Furthermore, negative consequences of criminal behavior and substance abuse become more pronounced following fatherhood (e.g., unemployment, child-welfare involvement; see Hirschi, 1969).

Some desistance pressures are specific to transitions in substance use. For example, public health warnings about the consequences of secondhand smoke to children may lead men to quit smoking when they become fathers. Women show an abrupt cessation of alcohol, tobacco, and other drug use following pregnancy (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997), which also may have indirect effects on men's patterns of use. Finally, caring for a child is generally incompatible with intoxication and its aftereffects.

In contrast to theories of social control, other theories emphasize men's drives to become a father. First, Lamb (1997) posited that men's motivation is an important determinant of father involvement. An implication is that many motivated men become involved fathers in the absence of external pressure or indeed even if institutional and social pressures discourage it. Second, Doherty, Kouneski, and Erickson (1998) suggest men embrace or reject cultural messages about responsible fatherhood and actively construct the role for themselves. Like Lamb's, this model of influences on father–child relations includes men's identification with and commitment to fatherhood; men who commit to fatherhood would be expected to abandon behaviors, such as crime, that conflict with role fulfillment. Third,

Nock (1998) argues that men are drawn to fatherhood and the performance of traditional roles, such as breadwinning and protection, as demonstrations of masculinity. Fourth, Dollahite and Hawkins (1998) assert that generativity—men's valuing of supporting the next generation and responsiveness to children's needs and dependence—rather than nagging social pressure and obligation, accounts for changes men make in order to become responsible fathers. Finally, although Popenoe (1996) argued that marriage and fatherhood are civilizing forces on unattached men, he also contended that family life leads men to shift the focus of their identity from independence and aggression to deep and unselfish care for children.

Prior Empirical Work on the Effects of Parenthood on Crime and Substance Use

Despite this rich theoretical basis, fatherhood rarely has been studied as an independent contributor to crime desistance, although men's own narratives identify it as an important influence (Laub & Sampson, 2003). Blokland and Nieuwbeerta (2005) used a dynamic typology approach in Dutch samples but did not find trajectories of crime to decrease after parenthood once they controlled for marriage; if anything, parenthood increased crime among sporadic offenders. Prior studies, however, had one or more limitations: a focus on criminal samples, consideration of samples born in earlier time periods, the reliance on retrospective methods, or a lack of analysis of whether effects depend on the age when men became fathers.

Some of the strongest findings on changes in substance use after fatherhood come from the Monitoring the Future Project (MTF; Bachman et al., 1997). Although men's cigarette smoking might be expected to change following fatherhood, Bachman et al. (1997) found that men with pregnant spouses showed the same increase in cigarette smoking over time that was shown by their peers. Furthermore, there were no differential change patterns among fathers relative to nonfathers and no relative decrease in smoking across a 2-year interval among men who became fathers. This stability may partially reflect the great difficulty most smokers have quitting (Hughes, Keely, & Naud, 2004). On the other hand, Blackburn, Bonas, Spencer, Dolan, Coe, & Moy (2005) surveyed British, cigarette-smoking fathers of newborns and found that, although few (4%) successfully quit, 78% tried to quit smoking in the home and 60% successfully did so. Thus, significant reductions in use, if not quitting, may follow first fatherhood.

In contrast to the lack of parenthood effects for smoking, Bachman et al. (1997) report that reductions in men's heavy alcohol use coincided with having a pregnant spouse and that becoming a father reduced general alcohol use beyond the effects of marriage. In contrast, marijuana use has not been found to change dramatically in response to fatherhood. For example, whereas pregnancy and parenthood had powerful effects on marijuana cessation in a community sample of women, there were no effects for men that were independent of marriage (Chen & Kandel, 1998). Similarly, Bachman et al. (1997) found that effects of fatherhood on reduced marijuana use generally were better explained by marriage. In all, prior research has examined fatherhood as a time of transition in crime and substance use trajectories, but few studies have used long-term prospective data, and none have tested whether trajectories of substance use decrease immediately or in an accelerated manner following first fatherhood.

Fatherhood in Developmental Context

Efforts to identify and understand the effects of fatherhood on criminal behavior and substance use must take developmental context and timing into account. Problem behaviors and their contextual underpinnings are powerful selection factors for early parenthood (Jaffee, Caspi, Moffitt, Taylor, & Dickson, 2001; Pears, Pierce, Kim, Capaldi, & Owen,

2005). Younger fathers often start their families at significant disadvantage. For example, fathers who were ages 17–19 years had histories of more juvenile arrests, were less likely to have completed high school, and showed higher rates of tobacco and marijuana use compared with their same-age peers (Fagot, Pears, Capaldi, Crosby, & Leve, 1998). Unfortunately, although parenthood presents an opportunity to assume adult roles, developmentally early parenthood can entrench unconventional behavior, lead to emotional maladjustment (Elder, 1998), and become one more failure in a sequence of life failures (e.g., school dropout, unemployment).

Marsiglio and Cohan (1997) highlight that adolescent and young-adult fathers may not experience the same drives and impulses as older fathers. Specifically, consistently putting children's needs ahead of their own is not developmentally expected for young fathers, nor is generativity developmentally relevant. Furthermore, young men may resist the limits fatherhood places on newly granted autonomy and may view the caretaking role as a threat to masculinity (Marsiglio & Cohan). Thus, crime and substance use trajectories may be impacted differently by developmentally "off-time" (i.e., young) versus normative timing of fatherhood.

Accounting for Effects of Marriage and Cohabitation

Marriage can be a turning point in the life course of criminally involved men. For example, it is associated with a 35% average reduction in the probability of crime (Sampson & Laub, 1990, 2005), and analyses over time support that the same man commits fewer crimes when married than when not (Sampson & Laub, 2005). Similarly, Bachman et al. (1997) found that marriage and engagement were powerful and pervasive influences on alcohol, cigarette, and marijuana use patterns during young adulthood. Indeed, multiple studies support the result that getting or being married is associated with further decreases in an already decreasing developmental trajectory of marijuana (Chen & Kandel, 1998) and alcohol use (e.g., Curran, Muthén, & Harford, 1998) in early adulthood or a flattening of an increasing trajectory of alcohol use from adolescence to adulthood (Bachman et al., 1997). Though not all studies support marriage effects (e.g., Duncan, Wilkerson, & England, 2006), it is clear that claims regarding changes following fatherhood must be distinguished from those attributable to marriage. Similarly, the direction of associations between unmarried cohabitation and outcomes is not clear (e.g., Bachman et al., 1997; Duncan et al., 2006) but must be distinguished from changes linked to fatherhood.

The Present Study

We extend prior research by considering a sample of males who were at elevated risk for delinquency and who were followed from their early adolescent to young adult years. Possible changes in crime, arrest, and tobacco, alcohol, and marijuana use trajectories following the birth of a first biological child were examined; specifically, whether level and/or slope decreases (i.e., accelerated decrease) occurred relative to expected trajectories. Evaluating these longer term change patterns is unique to this study and is important because outcome behaviors known to change could shift gradually relative to expected trajectories (i.e., slope but not level change) or abruptly change (level change), but then either stabilize (no slope change), further depart from expected trajectories (negative slope change), or rejoin them (positive slope change).

Consideration of behavior trajectories across 2 decades of fully prospective, annual assessments confers several advantages for understanding associations between fatherhood and later adjustment. First, the span of data collection captures the range of ages at which men become fathers across the early lifespan, and this range also permits examination of long-term trajectory changes. Second, the prospective design permits consideration of

trajectories of nonfathers and of men before they became fathers. In addition to design advantages, the present sample is well-suited to examination of these issues. Findings based on this sample may be more generalizable to current American cohorts, given national and secular trends in acceptable patterns of substance use, normative ages of transition to parenthood, and the social acceptance of cohabitation and parenting out of wedlock. Additionally, the at-risk participants showed more variability in life-course outcomes than may be observed in community, clinical, or juvenile justice samples. For example, given the design of the MTF study, findings may not generalize to young adults who dropped out or became parents before their senior year in high school.

Study Hypotheses and Research Questions

a. Men's crime and substance use were expected to decrease following first fatherhood. Changes were expected to be marked and long lasting. Effects were expected to persist after the effects of marriage (and cohabitation) and of men's childhood contextual risk were controlled.

b. As crime is inconsistent with fatherhood as an identity and tobacco use has well-known impacts on child health, these outcomes were expected to show immediate level decreases following fatherhood. Given that heavy alcohol use impairs the capacity for caretaking and participation in family life, we expect alcohol use would show a level decrease. Marijuana use may be more sporadic, intoxication is less impairing, and aftereffects are less aversive; thus, a level decrease following fatherhood was not expected. Finally, given that men spend less time in the peer contexts that support crime, marijuana, and heavy alcohol use following fatherhood, decreases in slopes for these trajectories were expected, reflecting accelerated decreases.

c. Premature and unconventionally ordered transitions have been found to lead to further unconventional behavior and poorer emotional adjustment (e.g., Elder, 1998). We expected fatherhood to have an increasingly powerful effect on men's behaviors the older they were at the time of this transition. Thus, trajectories were expected to decrease more markedly following fatherhood among men who make this transition later in early adulthood compared to those who make it earlier (e.g., in adolescence).

Method

Participants

Participants (N = 206) were recruited in 1983–1985 from schools located in a medium-sized metropolitan area in the Pacific Northwest that were selected based on higher-than-average rates of juvenile delinquency in the neighborhood relative to other area schools. All fourth-grade boys in selected schools were invited to participate. A 74.4% recruitment rate resulted in a sample of 206 participants, ages 9–10 years. Boys' families reported primarily lower socioeconomic status, with a median annual income of $10,000–$14,999. More than 20% of parents were unemployed at the time of recruitment and 20% of the families received some form of financial assistance. Ninety percent of the sample was White. Forty-two percent of the families had two biological parents, 32% had a single biological parent, and 26% were stepparent families. More details on recruitment and characteristics of the sample are reported in Capaldi & Patterson (1989). Participants were assessed annually from ages 12 to 31 years, with the exception of age 26 years. Retention was strong; overall participation rates at each wave were 94% or higher.

Measures

Self-reported crime—Men completed the Elliott Delinquency Scale (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983) annually regarding frequency of minor and major delinquent nonstatus offenses in the past year (e.g., "stolen or tried to steal something worth more than $50," "attacked someone with the idea of seriously hurting or killing that person"). Frequencies of more than 365 times for an individual item were recoded to 365. The final score was calculated at each wave as the sum of 33 recoded items (mean $\alpha = .76$).

Arrests—The number of times participants were arrested annually was derived from official juvenile and adult court record searches conducted in all locales in which participants lived. Arrest records included the date and type of each offense. Arrests related to protective custody, minor traffic violations, and contempt of court were excluded. Arrests and self-reported crime across all measurement occasions were modestly related ($r = .21$, $p < .001$).

Substance use—Men reported on alcohol (beer, wine, hard liquor), tobacco, and marijuana use in the past year; annual frequencies were recoded to a 9-point scale (0 = *no use*, 1 = *once or twice*, 2 = *every 2–3 months*, 3 = *once per month*, 4 = *every 2–3 weeks*, 5 = *once per week*, 6 = *2–3 times per week*, 7 = *once per day*, 8 = *2–3 times daily*). As the level and shape of trajectories of use over time differed by substance, outcomes were modeled separately.

Age—Participants' ages in years at each wave were used as the measure of time in multilevel models. Age also was used to calculate a cross-level interaction term used in some models (see fatherhood status below). To avoid estimating outcome intercepts at age 0 (e.g., arrests at the time of birth), ages were centered at age 13 years (i.e., age 13 = 0).

Cohabitation and marital status—Men reported their relationship status at each wave from ages 17–18 years as single, cohabiting (living with a partner while unmarried), or married. Men who were married but separated (12 participants at a total of 14 measurement occasions) were coded as single. No men had cohabited or married prior to ages 17–18 years. For each wave, two contrast codes were created for cohabitating versus single (married cohabitating = 0, unmarried cohabitating = 1, single = −1) and married versus single (married cohabitating = 1, unmarried cohabitating = 0, single = −1); when modeled simultaneously, these variables estimate the independent effects of marriage and cohabitation relative to being single.

Fatherhood status—From age 17 years, men reported whether they had fathered a biological child. The child's birth date was used to calculate age at first fatherhood. Fatherhood status then was coded from ages 12 to 31 years as 0 prior to the birth and as 1 subsequently.

Time since fatherhood—The time in years since first biological fatherhood was calculated by subtracting the child's date of birth from the date of each assessment (scored 0 for all waves prior to the birth and 0 for all men who did not become fathers).

Childhood risk—A composite ($\alpha = .70$) of four factors found to predict earlier ages of first intercourse and first fatherhood in this sample (Capaldi, Crosby, & Stoolmiller, 1996; Pears et al., 2005) was created to control for potentially confounding effects of selection factors for fatherhood on behavioral trajectories following fatherhood. These included (at ages 9 to 11 years old): (a) parents' antisocial behavior based on self-reports, official arrest and motor vehicle suspension records, and interviewer ratings; (b) parents' substance use

based on self- and partner reports of the frequency and quantity of tobacco, alcohol, and marijuana use; (c) transitions in family structure through age 11 years, based on interviews with parents regarding the number of times the participant had had a parent figure move in or out of his home; and (d) mothers' self-reported age at the birth of her first biological child (multiplied by −1 so that higher scores indicated greater risk), collected by interview. Because of space constraints, readers are referred to the following website for measurement and statistical details on the development of this construct. (An appendix listing detailed measurement information for the childhood risk construct is available at http://www.oslc.org/appendices/jmf_fatherhood_oys_kerr.pdf.)

Father—child coresidence—Annually, beginning at age 18 years, men who had a biological child were asked how often they saw her or him; responses were on an 8-point scale ranging from *live with full time* to *never see.* A time-varying dichotomous measure was then formed: coresidence was equal to 1 if the man lived full time with at least one biological child and was equal to 0 if they had no offspring or did not coreside full time with any biological children. The coresidence variable could only be used to model outcome trajectories from age 18 years on, and thus excluded data from the prefatherhood years for 8.7% of the sample (i.e., the higher-risk teen fathers). Thus, this variable was considered in exploratory analyses only.

Data Analyses

Multilevel modeling of discontinuous change (Singer & Willett, 2003) was selected as the most relevant analytic approach, given our interest in behavioral trajectories before and after an event (the timing of which varied by person) and our focus on questions about within- and between-person variation in outcomes. For each outcome, the unconditional model was first estimated (i.e., modeling only the mean for the outcome and the variance within and between participants), followed by estimation of the random linear and fixed quadratic effects of time. Predictors of interest were then stepped in hierarchically to establish whether there were effects of fatherhood on the outcome trajectories, and, if so, whether they remained significant after covariates were controlled. In Step 1, the random effects of father status were tested for shifts in the *level* of the outcome trajectory following first fatherhood. Time since fatherhood also was added to examine subsequent shifts in the *slope* of the outcome trajectory. In Step 2, covariates were added; specifically, childhood risk as a fixed between-level predictor, and the cohabitation and marriage variables as fixed within-level variables.

Next, to test whether the effects of father status and time since fatherhood (within-subjects variables) depended on the age at first fatherhood (between-subjects), the random effects of fatherhood variables were regressed on age at first fatherhood (cross-level interaction) within the subsample of men who became fathers by age 31 years. The models controlled for covariates as well as the cross-level interactions of childhood risk with father status and time since fatherhood.

Analyses were conducted using the multilevel random analysis option of Mplus 5.2 (Muthén & Muthén, 1998–2007). The MLR (maximum-likelihood robust to non-normality) estimator was used; it has been found to be "asymptotically equivalent to the Yuan-Bentler T2 test statistic" (Muthén & Muthén, 1998–2007). Nested models were compared using the log-likelihood scaling factor adjustments (Satorra & Bentler, 2001). Thus, reported χ^2 difference tests account for this adjustment. Deviance and Akaike Information Criterion (AIC) statistics were used to evaluate model fit (smaller values indicate better fit). The Deviance statistic (−2 multiplied by the loglikelihood estimate) quantifies the degree to which the model estimated covariance matrix deviates from the observed sample covariance matrix.

The AIC rewards model parsimony by applying a penalty to the Deviance statistic for every estimated parameter. All outcomes (with exception of normally distributed alcohol use) were transformed to more closely approximate a normal distribution and to reduce the effects of outliers. Outcomes were standardized (*z*-score) across all time points and participants to enhance interpretation.

Missing Data

Rates of missing observations ranged from 3.1% to 3.4%. Given that such rates are unlikely to bias results or impact power (Graham, 2009), and given that multilevel modeling does not assume equal numbers of observations or fixed time points, cases with missing outcome data at a wave had all data from that wave omitted from the analysis. Additionally, because outcome variables were not assessed at age 26 years, models were simply estimated from all other waves of data. Thus, all 206 original participants contributed data to the analyses, and these patterns of missing data and varying time between assessment time points described above did not adversely impact modeling (Hox, 2000).

Results

Descriptive Statistics

Though the study started when boys were age 9 years, they had a mean age of 12.9 years when fatherhood was first assessed. At the last wave considered here (age 31), 191 men participated, and the mean age was 32.0 years; 3 men had died and 12 had ceased participation. Over the 19 assessment years examined, 161 men (78%) participated at every occasion, and 195 participated at 15 or more occasions (i.e., 95% had records that were 79% complete or more).

The percentages of the sample who were married, cohabitating, and/or fathers at each wave are reported in Table 1. At the last wave considered here, 140 (68%) of the men had fathered a biological child (youngest at 14.1 years; mean = 23.6 years; mode = 22 years).

Means for the outcomes at each wave are reported in Table 1. Further information on the distributions also helps characterize the sample. Total arrest frequencies across the study were as follows: 30% of men were never arrested, 19% were arrested once, 8% twice, 7% three times, and 35% four or more times. The mean (*SD*) total number of arrests was 5.4 (7.6), with a maximum of 40. At age 12 years, 51% reported no alcohol use and 1% reported at least weekly use. By age 31 years, only 18% reported no alcohol use, with 7% reporting daily use or more. At age 12, 77% of boys reported no use of tobacco, whereas 2% reported daily use or more; proportions of use at age 31 years were 44% and 44%, respectively. At age 12 years, 95% of the boys reported no marijuana use; by age 31, 68% reported no use and 5% reported daily use or more. Compared to MTF participants at similar timepoints in young adulthood (Jackson, Sher, & Schulenberg, 2008), men in the present sample reported slightly lower rates of binge drinking, but higher rates of tobacco and marijuana use.

Multilevel Modeling

Given the number of models considered, only effects directly relevant to the hypotheses are summarized below and only selected findings could be presented graphically. Parameter estimates for mean effects in the final models are reported in Table 2; rows depicting estimates for the within-subjects effects of father status and time since fatherhood on the outcomes are most relevant to the hypotheses. As a general note, regardless of whether there were significant mean effects of fatherhood, variance in the effects of fatherhood and time since fatherhood was significant for every outcome except time since fatherhood on arrests; variances and covariances in the final model are available. (An appendix listing fit statistics

and unstandardized parameter estimates (standard error) for predictors of men's behavioral outcomes at Step 2 of final models is available at http://www.oslc.org/appendices/jmf_fatherhood_oys_kerr.pdf.)

Self-reported crime—Linear ($p < .10$) and quadratic ($p < .001$) time effects reflected the doubling of rates of crime from age 12 to the peak at age 16 years, followed by decreases through the early 20s, and then a leveling off (see Table 1). At Step 1, the fatherhood effects were significant. The effect of father status (estimate [*est.*] = −.177, $p < .01$) indicated that criminal behavior decreased significantly following first fatherhood. The effect of time since fatherhood (*est.* = −.030, $p < .01$) meant that the slope in criminal behavior decreased relative to prior trajectories. Results at Step 2 are shown in Table 2. The effect of time since fatherhood remained significant, and marriage and lower childhood risk were associated with lower rates of self-reported crime. Figure 1 illustrates the model by showing trajectories for three comparable example groups: men who were married and became fathers at age 22 years (modal age for the sample), nonfathers who were married at age 22 years, and unmarried nonfathers.

When the model at Step 2 was rerun for men who ever became fathers, the cross-level interaction of father status and age at first fatherhood was significant (*est.* = −.032, $p < .05$); the older men were when they became fathers, the more pronounced the reduction in crime.

Official arrests—Time effects were significant (model change $p < .001$), though neither linear nor quadratic ($p < .10$) effects were independently significant; general trends observed in Table 1 suggested a more than doubling of arrests from age 12 to the peak at age 15 years, abrupt decrease after age 18 years, and gradual decrease thereafter. At Steps 1 and 2, the fatherhood effects were not significant. However, lower childhood risk and marriage were associated with significantly fewer arrests (Table 2). The association of childhood risk with random variation in the effect of time since fatherhood on arrests is not interpreted given that there was not significant variance in the effect at Step 1. Follow-up analyses of fathers did not support age at first fatherhood as a predictor of variance in the effects of either fatherhood variable.

Alcohol use—Linear and quadratic time effects were significant and consistent with the group-level alcohol use trajectory that rapidly rose across adolescence, leveled off at age 22 years, and then gradually declined (Table 1). Step 1 indicated significant effects of father status and time since fatherhood (*est.* = −.148 and −.031, $p < .05$), suggesting a level shift decrease in alcohol use following fatherhood and a relative decrease in slope of alcohol use over time. After both the associations of childhood risk with more frequent alcohol use (significant) and the effects of marriage and cohabitation (nonsignificant) were controlled (Step 2), the effect of father status persisted, and the effect of time since fatherhood was only slightly reduced ($p = .069$; see Table 2). Figure 2 depicts estimated alcohol use trajectories for three groups of men. Again, the decreases in alcohol use when nonfathers were married are shown, as are the additional level and (trend-level) slope decreases in use following fatherhood at age 22 years; unmarried, nonfathers' trajectories provide a basis of comparison.

In the follow-up model of men who ever became fathers, the cross-level interaction of age at first fatherhood with father status (*est.* = −.034, $p < .05$) was significant, whereas the interaction with time since fatherhood (*est.* = .007, $p = .061$) was not. Thus, the older men were when they became a father, the more pronounced the decrease in alcohol use after fatherhood.

Tobacco use—Significant linear and quadratic time effects ($p < .001$) indicated rapid increases in tobacco use that leveled off at ages 19–20 years, peaked at age 22 years, and then gradually decreased thereafter (see rates in Table 1). The significant effect of father status at Step 1 (*est.* = −.156, $p < .01$) indicated that men's tobacco use trajectories showed a level shift decrease following first fatherhood. As shown in Table 2, this effect remained significant at Step 2, after controlling for the effects of childhood risk and cohabitation on more frequent tobacco use and the effects of marriage on less frequent use. The pattern of findings is similar to the alcohol trajectories shown in Figure 2, but without the trend-level slope change following fatherhood.

In follow-up analyses, the cross-level interaction of time since fatherhood and age at first fatherhood was significant (*est.* = .011, $p < .01$); thus, the deceleration (i.e., decrease in slope) in tobacco use that followed fatherhood was less marked the older men were when they first became fathers. Figure 3 illustrates estimated effects for men who became fathers at age 20 versus 26 years, example ages meant to represent developmentally early versus expected timing of fatherhood. The level decrease in tobacco use after fatherhood reported in the full model is evident and did not differ by age at fatherhood; however, the less abrupt decrease in slope of use trajectories is evident for men who became fathers at age 26 than those who did so at age 20.

Marijuana use—Linear and quadratic time effects ($p < .001$) were consistent with a trajectory of marijuana use that peaked and leveled off across ages 19–22 years and then declined (Table 1). In Step 1, neither effect of fatherhood was significant. In Step 2, childhood risk was associated with more frequent use and marriage was associated with less frequent use (see Table 2); the effect of time since fatherhood did not reach significance at Step 2 ($p = .086$, *ns*), though there was variance in the effect ($p < .001$). Follow-up analyses revealed that the cross-level interaction of age at first fatherhood with time since fatherhood was significant (*est.* = .009, $p < .05$); this suggests that decreases in slope following fatherhood (which did not reach significance on average) were less pronounced the older men were when they became a father.

Exploratory analyses of father–child coresidence—Models were re-run through Step 2 using data from assessment waves that included measurement of father–child coresidence (i.e., at ages 18 years and older). Then father–child coresidence was examined as a fixed, within-level predictor of outcomes at Step 3 and changes in effects of fatherhood variables were noted.

First, the exploratory model of self-reported crime differed somewhat from the full model at Step 2, as effects of father status and time since fatherhood were significant (*est.* = −.143 and −.020, $p < .05$). At Step 3, father–child coresidence was associated with lower levels of self-reported crime (*est.* = −.233, $p < .001$) and neither of the fatherhood effects remained significant (*est.* = −.041 and −.015, $p > .10$). Second, arrests, which did not change following fatherhood in the previous models, also were not associated with coresidence in the exploratory model. Third, like the full model of alcohol use, the exploratory model yielded significant effects of father status at Step 2 (*est.* = −.145, $p < .05$). At Step 3, this effect was nonsignificant (*est.* = −.107, *ns*). However, this did not appear to be due to the inclusion of father–child coresidence, which was not significantly associated with alcohol use (*est.* = −.088, *ns*). Fourth, the model of tobacco use also differed from the primary model in that neither of the fatherhood effects were significant at Step 2; this may be because of the restricted focus on births that occurred after age 18 years. At Step 3, father–child coresidence was not significantly associated with tobacco use (*est.* = .016, *ns*). Finally, marijuana use, which did not change after fatherhood in the primary model, also showed no association with coresidence in the exploratory model.

Discussion

Findings from the present study of crime and substance use trajectories across ages 12 to 31 years for men from at-risk community backgrounds indicated that—relative to what would be expected given prior behavior, developmental trends, and effects of partnering—men engaged in less criminal behavior and less frequently used alcohol and tobacco following the birth of a first biological child. Overall, support was found for level shift decreases in alcohol and tobacco use trajectories and decelerating (slope decrease) crime trajectories following first fatherhood. As hypothesized, some changes in men's trajectories depended on the age at which they first became fathers (controlling for associations childhood contextual risk had with outcomes and with the tendency to father a child at a younger age). Specifically, the older men were when they became a father, the more pronounced were the decreases in crime and alcohol use that followed the birth. Surprisingly, however, tobacco and marijuana (and to some extent alcohol) use decelerated more markedly over time among men who became fathers at a younger age.

Key strengths of the study included the developmental span of the prospective data collection and the counterfactual approach. Though the primarily White, at-risk sample was not representative of the U.S. population, the men have shown high rates of arrest and substance use, and thus are a highly relevant sample for research questions about successful, premature, and failed transitions to adulthood, and desistance in crime and health-risking behavior.

Fatherhood and Crime Desistance

As hypothesized, trajectories of men's self-reported criminal behavior decreased following first fatherhood. Again, these changes exceeded expected developmental trends in crime desistance and the well-known "marriage effect." Changes in crime trajectories following fatherhood generally have not been examined separately from marriage effects or have not been supported (e.g., Blokland & Nieuwbeerta, 2005; Sampson & Laub, 1990). Exploratory analyses, although imperfect, supported the speculation that fathers' coresidence with their children partially explained effects of fatherhood. That is, fathers engaged in less criminal behavior during years in which they were living full time with their children, and after accounting for this effect, associations between first fatherhood and subsequent changes in trajectories were no longer significant.

Of interest, deceleration in criminal behavior followed fatherhood at all ages examined, although an abrupt level decrease in crime was stronger for older first-time fathers. Thus, for younger men, fatherhood was typically a gradual rather than abrupt turning point. There are several reasons why a culturally "off-time" (i.e., early) transition to fatherhood may not stimulate immediate change. Men who make this transition at a culturally expected time in development may be more likely to assume full father role status and function more autonomously from their own parents. For younger men, childrearing may interfere with transitions to adulthood, such as finishing school and becoming employed. Adopting the role of father also may represent generativity and masculinity for older men but be a threat to autonomy and masculinity for older adolescents (Marsiglio & Cohan, 1997). On the other hand, there was no group-level trend toward worsened crime trajectories for younger fathers —as might be expected based on developmental failure models—and younger fathers were no less likely to show slope decreases.

Changes in Tobacco Use Following First Fatherhood

Men showed clear reductions in tobacco use following fatherhood. Changes in tobacco use may have occurred because of men's concerns about the effects of smoking on their child's

health, pressures from partners and family, the costs of smoking, or changes in social contexts of smoking. This effect is striking, given the very low success rates among those who attempt to quit smoking (e.g., Hughes et al., 2004, reported 6-month abstinence rates of 3%–5%). Furthermore, one study found that although parenthood predicted attempted quitting, adults living with children had *lower* 6-month abstinence rates than nonparent peers (Tucker, Ellickson, Orlando, & Klein, 2005). Characterizing the pattern and context of fathers' less frequent tobacco use was beyond the scope of this study. Blackburn et al. (2005) found that having a baby rarely led men to quit smoking, but it led some to attempt to quit and many to successfully quit smoking in the home, both of which may decrease overall use. In contrast to the present findings, the MTF study did not find effects of partner pregnancy or fatherhood to impact men's smoking (Bachman et al., 1997). There were important differences between the risk status of participants in MTF (young adults who had stayed in high school until at least their senior year) and the present study (at risk for delinquency based on neighborhood factors and experiencing relatively high rates of school dropout). Thus, effects of fatherhood may depend on such risk.

A younger age at first fatherhood also was linked with a stronger subsequent deceleration in tobacco use. It is tempting to conclude that tobacco use trajectories are less easily disrupted for men who have been using longer and that early fatherhood is therefore protective. However, men who became fathers at a younger age more frequently used tobacco to begin with; after fatherhood, their trajectories quickly decreased but continued to trend higher than those of men who became fathers at older ages (see Figure 3). Still, it is hopeful that for both younger and older men tobacco use tended to change following the birth of their child, and changes in this important health behavior over time were particularly marked for younger fathers.

Changes in Alcohol Use Following First Fatherhood

Consistent with prior studies (Bachman et al., 1997), men less frequently used alcohol following fatherhood, and decreases in alcohol use were stronger the older men were when they fathered a child (Labouvie, 1996). It was not clear whether qualitative shifts in alcohol use occurred (e.g., from frequent binging to regular moderate use). Changes following fatherhood may be explained by incompatibility of heavy drinking with parenting and work responsibilities. Theories of social control and differential association also are relevant; Labouvie (1996) found that decreases in young adults' alcohol use following parenthood were facilitated by socializing with friends who had children and who had lower levels of substance use.

Limited Effects for Arrests and Marijuana Use

No support was found for changes in arrest trajectories following first fatherhood, though there was significant variance in the effects examined. Arrests are relatively infrequent, especially past the mid-20s, and are less sensitive to fluctuations in antisocial behavior than self-reports. The general lack of support for changes in marijuana following fatherhood are consistent with some prior studies (Bachman et al., 1997; Chen & Kandel, 1998) and may be explained by the ease with which use can be maintained following the birth of a child. Compared with alcohol binging, marijuana intoxication may result in less functional impairment and may interfere less with the demands of child care. Similarly, child health risks presented by parents' occasional covert marijuana use may be minor compared to those associated with parents' patterned tobacco use. Contrary to hypotheses, changes in the slope of marijuana trajectories following fatherhood (which were not significant overall) were less pronounced the older men were when they became fathers. Marijuana use may be more dependent on peer contexts in adolescence than in young adulthood; if fatherhood distances young men from peers, their marijuana use may be reduced.

Effects of Marriage and Cohabitation

Consistent with prior studies on the effects of marriage on problem behavior desistance, being married rather than single was associated with less self-reported crime, fewer arrests, and less tobacco and marijuana use (Bachman et al., 1997; Sampson & Laub, 2005). Marriage was not an independent correlate of alcohol use, although inclusion of marriage and cohabitation significantly improved the alcohol model and suggested beneficial effects. Consistent with Duncan et al. (2006), cohabitation generally had no independent effect on the outcomes, suggesting that the effects of marriage may stem from committed partnership and may not be conferred by a shared living arrangement and shorter-term commitment. As in Bachman et al. (1997), cohabitation was associated with more frequent tobacco use relative to being single and may reflect both selection and socialization factors; men who smoke may be less likely to marry, and may form romantic attachments to other smokers, who facilitate their continued tobacco use. In general, the effects on crime and substance use are consistent with the notion that marriage tempers men's behaviors and lifestyles, and marriage effects are not explained by fatherhood.

Limitations

Limitations of this study suggest directions for further investigation. First, although there is broad theoretical justification for the prediction that criminal and substance use behavior should decrease following fatherhood, this study was not designed to test specific theories regarding why this occurred (e.g., social control, generativity); furthermore, although our study is grounded in other literatures, biological and evolutionary explanations for effects of fatherhood on men's behavior also have been proposed (e.g., Gray, Kaylenberg, Barrett, Lipson, & Ellison, 2002) and may be relevant here. Second, our examination of a presumed mediator of obtained effects—men's coresidence with biological children—excluded data collected prior to age 18. Third, men's problem-behavior trajectories were examined to age 31 only; changes following fatherhood may differ for older men. Fourth, future research should examine the degree to which fatherhood, marriage, and cohabitation impact men's problem-behavior trajectories because of changes in their partners' problem behaviors. For example, Tucker et al. (2005) found that moving in with a nonsmoking partner was associated with a threefold increase in the probability of quit attempts, whereas simply getting married was not significantly associated with attempted quitting. Capaldi, Kim, and Owen (2008) also found that men were less likely to desist from crime if their partners showed more antisocial behavior. Furthermore, the effects of children's behaviors and characteristics on their fathers' role engagement and behavioral trajectories were not examined. Slope changes could reflect new pressures and rewards as children age and as additional children are born. Fifth, it was not possible to examine qualitative shifts in the outcome behaviors that may have occurred (e.g., from daily smoking to abstinence) in a single paper. Finally, generalizability may be limited by the present sample. Men were primarily White and were recruited from the same at-risk neighborhoods during the same time period. Replication in representative and underrepresented minority samples is needed.

Findings are consistent with the theory that first fatherhood may result in a critical push toward desistance from crime and substance use, both immediately and over time. Thus, decreases in men's behaviors in adulthood may not be due only to age-related maturation and marriage. This study therefore represents an important step forward in understanding desistance. There was significant variance among the men, however, in these changes following fatherhood. Understanding differences in men's responses to fatherhood demands further consideration, as whether and how men change impacts their own health and their capacities to contribute to their children's healthy development. Crime and substance use are known to be resistant to change and to be highly stable at the intra-individual level. Yet,

interventions may be especially effective if delivered during periods of relative openness to change (e.g., Roy & Dyson, 2010).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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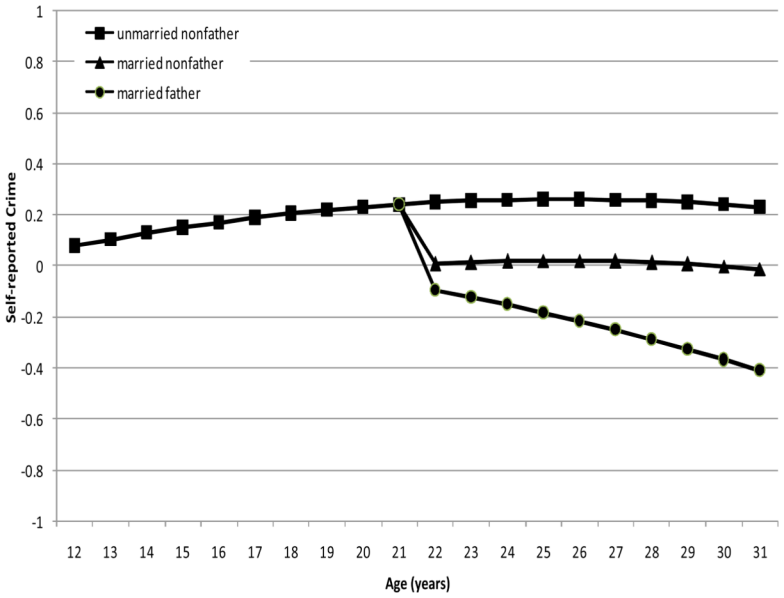

Figure 1.
Crime Trajectories for Unmarried Nonfathers, Married Nonfathers, and Married Fathers.

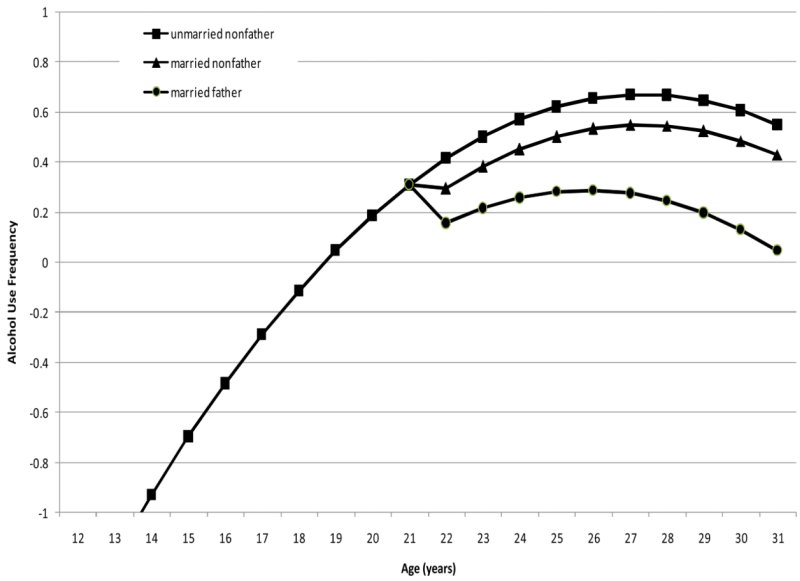

Figure 2.
Alcohol Use Trajectories for Unmarried Nonfathers, Married Nonfathers, and Married Fathers.

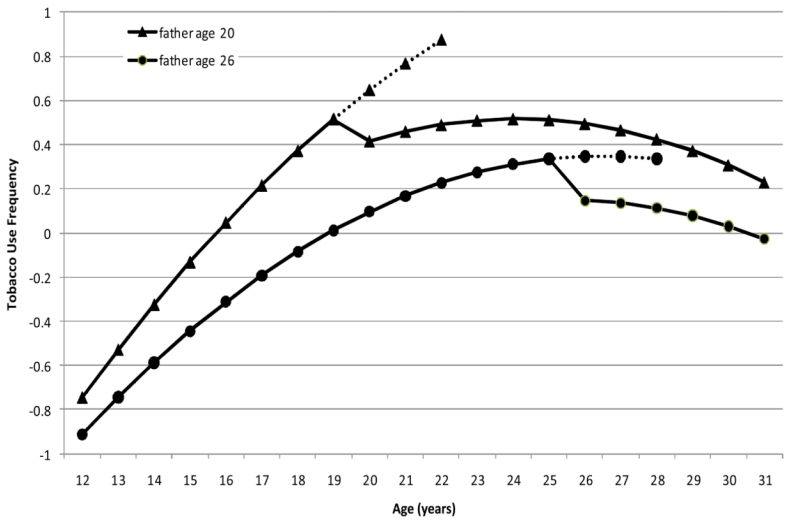

Figure 3.
Tobacco use Trajectories for Men Who Became Fathers at Age 20 or 26 Years, Relative to Extrapolated Pre-Fatherhood Trajectory (dashed line).

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Table 1

Mean Crime and Substance Use Frequency, and Rates of Marriage, Cohabitation, Fatherhood, and Father–Child Coresidence, by Age

Age (years)	Self-Reported Crime Mean (*SD*)	Official Arrests Mean (*SD*)	Tobacco Use Mean (*SD*)	Alcohol Use Mean (*SD*)	Marijuana Use Mean (*SD*)	Married (%)	Cohabitating (%)	Father (%)	Father–Child Coresidence (%)*
12	21.45 (70.86)	0.24 (0.81)	0.65 (1.60)	0.85 (1.08)	0.07 (0.34)	0.0	0.0	0.0	—
13	32.80 (83.85)	0.32 (1.02)	1.23 (2.42)	0.97 (1.04)	0.20 (0.66)	0.0	0.0	1.0	—
14	28.28 (89.24)	0.46 (1.23)	2.01 (3.08)	1.40 (1.44)	0.47 (1.30)	0.0	0.0	1.9	—
15	28.75 (80.07)	0.66 (1.84)	2.46 (3.36)	1.72 (1.80)	0.72 (1.74)	0.0	0.0	2.4	—
16	40.84 (158.42)	0.57 (1.41)	3.16 (3.63)	2.45 (1.95)	0.93 (1.93)	0.0	0.0	4.9	—
17	34.43 (110.27)	0.49 (1.18)	3.88 (3.68)	2.79 (1.97)	1.35 (2.27)	0.5	4.0	8.7	—
18	30.68 (92.82)	0.27 (0.80)	4.07 (3.79)	3.24 (2.04)	1.82 (2.51)	3.0	14.4	14.6	23.3
19	33.28 (98.41)	0.26 (0.67)	4.40 (3.67)	3.39 (2.09)	1.98 (2.62)	8.0	20.9	20.4	34.1
20	23.41 (80.53)	0.25 (0.79)	4.54 (3.65)	3.76 (2.00)	2.00 (2.53)	13.3	30.5	24.8	48.0
21	22.07 (62.38)	0.26 (0.65)	4.48 (3.68)	4.34 (1.93)	2.04 (2.62)	15.8	34.2	29.3	48.3
22	18.62 (59.17)	0.28 (0.73)	4.61 (3.64)	4.38 (1.92)	2.00 (2.52)	19.2	40.9	38.1	48.1
23	14.96 (69.54)	0.19 (0.66)	4.52 (3.64)	4.22 (1.88)	1.90 (2.55)	25.3	50.0	44.1	54.4
24	9.93 (29.60)	0.20 (0.52)	4.53 (3.64)	4.24 (1.92)	1.66 (2.43)	27.6	51.3	47.6	56.3
25	11.81 (37.08)	0.21 (0.60)	4.46 (3.68)	4.10 (2.09)	1.64 (2.50)	31.6	54.6	51.0	52.9
27	8.23 (21.64)	0.15 (0.63)	4.33 (3.76)	3.94 (2.14)	1.62 (2.51)	40.5	63.7	57.1	61.1
28	7.94 (43.18)	0.12 (0.60)	4.22 (3.78)	3.79 (2.34)	1.32 (2.43)	39.1	68.2	59.1	61.2
29	9.60 (56.76)	0.15 (0.59)	4.15 (3.82)	3.86 (2.24)	1.45 (2.42)	46.6	68.1	61.1	65.8
30	15.83(113.23)	0.15 (0.59)	4.02 (3.85)	3.79 (2.31)	1.14 (2.25)	45.0	71.4	65.0	65.0
31	13.21 (54.24)	0.16 (.58)	4.01 (3.80)	3.86 (2.34)	1.38 (2.36)	49.7	70.7	68.0	68.2

Note.

*Percentages of fathers at each age who were co-residing with their child.

Table 2

Fit Statistics and Unstandardized Parameter Estimates (Standard Error) for Predictors of Men's Behavioral Outcomes at Step 2 of Final Models

Model at Final Step	Self-Report Crime		Official Arrests		Tobacco Use		Alcohol Use		Marijuana Use	
N	3,763		3,770		3,762		3,766		3,765	
Log likelihood	−4562.557		−4946.200		−3386.032		−3926.207		−4062.661	
Deviance	9125.114		9892.400		6772.064		7852.414		8125.322	
Akaike Information Criterion	9169.114		9936.400		6816.065		7896.414		8169.323	
Number of free parameters	22		22		22		22		22	
Intraclass correlation	.324		.215		.529		.259		.407	
	Est.	(*SE*)	Est.	(*SE*)	Est.	(*SE*)	Est.	(*SE*)	Est.	(*SE*)
Within-subjects effects										
Intercept for outcome	−.032	(.07)	−.008	(.07)	−.752***	(.05)	−1.251***	(.05)	−.702***	(.05)
Linear time (random)	.025†	(.01)	.000	(.01)	.179***	(.01)	.258***	(.01)	.176***	(.01)
Quadratic time (fixed)	−.001*	(.00)	−.001	(.00)	−.007***	(.00)	−.009***	(.00)	−.007***	(.00)
Father status (random)	−.103†	(.06)	.098	(.07)	−.123*	(.05)	−.139*	(.06)	−.025	(.07)
Time since fathering (random)	−.033**	(.01)	−.005	(.01)	.004	(.01)	−.027†	(.02)	−.023†	(.01)
Cohabitation versus single (fixed)	−.030	(.03)	−.006	(.04)	.086***	(.02)	−.023	(.03)	.035	(.03)
Married versus single (fixed)	−.106**	(.03)	−.135***	(.03)	−.109**	(.04)	−.049	(.04)	−.098**	(.04)
Between-subjects effect										
Childhood risk	.281***	(.05)	.329***	(.06)	.213***	(.05)	.167***	(.03)	.174***	(.04)
Random effects regressed on childhood risk										
Linear time	−.008	(.01)	−.011*	(.01)	−.010	(.01)	−.005	(.01)	.007	(.01)
Father status	−.001	(.06)	−.103	(.06)	−.006	(.04)	.119†	(.06)	−.055	(.07)
Time since fathering	−.002	(.01)	.015*	(.01)	.005	(.01)	−.022†	(.01)	−.005	(.01)

Note.

† $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.