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Absent Father Timing and its Impact on Adolescent and Adult Criminal Behavior

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Abstract

Although prior research has examined the link between having an absent biological father and self-reported delinquency, few studies have assessed the influence of the timing of paternal absence (i.e., the child's age when father leaves) on delinquency and adult criminal behavior. Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), the present study examines this relationship to determine whether the timing of biological father absence impacts delinquency, adult criminal behavior, and arrest across the life course. Results reveal that biological father absence before birth was related to criminal behavior in later adulthood. Having an absent father in early childhood (birth to age 5) was related to criminal behavior in early adulthood as well as arrest. An absent biological father in late adolescence (age 14 to 18) was associated with arrest. These findings suggest that: 1) the timing of father's absence does not have a clear pattern of impact on delinquency and arrest and 2) the negative impact of having an absent biological father—at any time—may not appear until adulthood.

Keywords Absent father · Adolescence · Delinquency · Criminal behavior · Arrest · Add Health · Family structure

Though the majority of youth under the age of 18 live in two-parent homes, the United States Census Bureau reports that over 20 percent live in single-mother headed households (U.S. Census, 2016). In 2018, this amounted to over 18 million

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youth living in single-mother homes (U.S. Census, 2018). Much criminological research has focused on this population, with many studies finding that biological father absence is linked to an array of negative outcomes for youth including: increased risk of school discipline (Heard, 2007), lower educational attainment and success (Ermisch et al., 2004; Radl et al., 2017), increased depressive symptoms (Markowitz & Ryan, 2016), increased likelihood of early childbearing (Ermisch et al., 2004), and delinquency (Demuth & Brown, 2004; Kierkus & Hewitt, 2009; Mott et al., 1997; Wells & Rankin, 1991).

Although considerable research has examined the link between having an absent biological father and negative life outcomes (Austin, 1978; Ermisch et al., 2004; McLanahan et al., 2013; TenEyck et al., 2019), few studies have assessed the influence of the timing of paternal absence (i.e., the child's age when the father leaves) on self-reported delinquency and arrest. Research examining the impact of parenting on child development have found that the role fathers play in development is different than that of mothers, and the influence of the father differs across developmental stages (Meuwissen & Carlson, 2015; Paquette, 2004; Yogman et al., 2016). For example, Pougnet et al. (2011) found father presence in childhood (i.e., 6 to 10 years old) and use of control in early childhood was predictive of higher cognitive functioning and less internalizing behavioral issues between the ages of 9 and 13. Moreover, timing of paternal absence may coincide with critical developmental stages, wherein the father's departure inhibits the development of adequate attachment and socialization techniques, resulting in long-term internalizing and externalizing behavioral outcomes (Bowlby, 1969; Young et al., 2020). Thus, examining the link between child age at paternal absence and delinquency may provide insight into underlying developmental mechanisms influencing behavioral outcomes across the life course.

A central principle of developmental and life-course (DLC) criminology is that the impact of a life-course event is dependent upon the period of time in which the change occurs (Elder, 1998; Farrington, 2003). In particular, developmental scholars maintain that individuals experience transitions that alter the trajectory their life follows (Elder, 1998; Heard, 2007; Moffitt, 1993; Sampson & Laub, 1990). Trajectories are developmental pathways which span the life course (Sampson & Laub, 1990). Along these pathways, life events, transitions, and/or turning points occur and shift the outcome of the pathway. As Heard (2007) indicates, the family structure is a life-course trajectory. The departure of a parent alters this trajectory, and depending on when the departure occurs, the impact may be consequential in the development of antisocial behaviors across the life course. In this way, having an absent biological father may alter one's trajectory in such a way that it can increase their delinquent and criminal involvement throughout their life course. For instance, individuals with an absent father may have less direct and indirect control, impacting their bonds with adults (Hirschi, 1969) and lowering their self-control (Gottfredson & Hirschi, 1990), leading to delinquency. These individuals may also experience negative life outcomes such as lower self-esteem (Luo et al., 2012) and increased depressive symptoms (Culpin et al., 2013) in childhood and adolescence or greater financial strain in adulthood (Fronstin et al., 2001; Shenk & Scelza, 2012). These early risk factors, in turn, can then negatively impact these individuals throughout

their life course. To be sure, an absent biological father in childhood and/or adolescence may be an early risk factor that could negatively impact an individual's development—or life-course trajectory—leading to criminal behavior later in life.

In order to provide a deeper understanding of the impact of the timing of father absence, the current study will add to the literature by using a nationally representative longitudinal sample to examine the effects of timing of biological father absence on delinquency, criminal behavior, and arrest across the first three decades of the life course. The use of longitudinal data will allow for an examination of the long-term effects of father absence—an area which has not been thoroughly examined as of yet (McLanahan et al., 2013). This will enable us to unpack the specific impact of father absence at different developmental periods. Before discussing the influence of absent father timing on delinquency, it is first necessary to briefly review the literature on the topic of father absence and delinquency.

Father Absence and Criminal Behavior

The role of family in an individual's development has long been of interest to social scientists (Durkheim, 1888; Freud, 1909; Hirschi, 1969; Merton, 1968). Research suggests that the family, particularly parents, plays an essential role in the socialization of youth (Hirschi, 1969). This socialization occurs through the enactment of control—and if effective—constrains youth from engaging in antisocial behaviors. Hirschi (1969) theorized that control was established through strong social bonds to prosocial others. When bonded to a prosocial other, individuals are less likely to engage in delinquent behaviors. If this bond is weak or broken, however, control fails to be established or maintained, and delinquency is more likely to occur. It is posited that this control is greater amongst intact family structures (i.e., both parents living together) than in families in which one parent is absent (Demuth & Brown, 2004; Nye, 1958).

The breakdown of the family structure has been found to impede the ability to enact and maintain control, both direct and indirect, thus resulting in a higher likelihood of youth engaging in antisocial behaviors (Gottfredson & Hirschi, 1990; Hirschi, 1969; Nye, 1958; Reiss, 1951). Gottfredson and Hirschi (1990) suggest that parents instill self-control through effective social control and behavioral management. Known as the parental management thesis, effective socialization occurs in three steps: 1) parents monitor youth behavior, 2) parents recognize when youth engage in deviant behavior, and 3) parents punish deviant behavior (Cullen et al., 2008). Effective socialization by parents allows for the internalization of self-control by youth, thus controlling behavior. Additionally, Hirschi (1969) identified attachment as a factor in control. Namely, adequate attachment to parents increases social bonds and control and in turn, decreases delinquency. Therefore, disruption of the family structure impedes the ability to establish adequate attachment with youth.

While there are many family structure variables that have been examined, the concept of family disruption or a "broken home"—defined as a living situation in which at least one of the biological parents is absent from the home—is one of the oldest and most assessed (Rebellon, 2002; Wells & Rankin, 1991). Recent research

tends to find a positive relationship between family structure and delinquency (Heard, 2007; Kierkus & Hewitt, 2009). Both Kierkus and Hewitt (2009) and Demuth and Brown (2004) found that youth from nontraditional family structures were more likely to engage in delinquent behaviors than youth from intact families. After controlling for family processes such as parental monitoring, involvement, and closeness, however, Demuth and Brown (2004) found the effects of family structure were rendered nonsignificant and concluded that family process mediates family structure, suggesting that the absence of a parent does not matter when factors such as these are considered. Further, a review of 27 studies assessing the effects of father absence or divorce on externalizing behavior identified that 19 studies reported a positive and significant relationship, while the rest reported no significance (McLanahan et al., 2013). Although some scholars have found null results (Paschall et al., 2003), the general agreement within the literature is that intact families may act as a protective factor preventing youth from engaging in criminal behavior throughout their life course, while growing up in a home with family disruption acts as a risk factor.

Taken together, results suggest the absence of the biological father negatively affects various behavioral outcomes for youth. Delving deeper, contextual factors surrounding the absence may further impact the observed outcome. In particular, there may be a relationship between the child's age at absence and the absence itself, which causes the effect to be more severe (e.g., having a biological father leave early in life may have a more detrimental impact). While substantial research has considered how absence affects youth outcomes, less attention has been focused on the effects of timing of father absence.

Timing of Father Absence and Delinquency

While the research is suggestive of a positive effect of father absence on delinquency, findings from the literature examining the effects of *timing* of father absence on delinquency are mixed (Ermisch et al., 2004; Markowitz & Ryan, 2016; Shenk & Scelza, 2012). Although research on the subject may be grouped based on findings concerning the age at which disruption is most impactful, as a whole, there is little consensus on when the disruption is most significant. For example, Juby and Farrington (2001) suggested that disruption of the family structure when the child is younger than 5 or between the ages of 10 and 14 has a greater effect on delinquency than if the disruption occurs between the ages of 5 and 9. Results from later research are in partial concurrence, with Markowitz and Ryan (2016) finding that paternal departure occurring later in childhood (between the ages of 6 and 14) was associated with delinquency in adolescence—but that departure in early childhood (under age 5) was not associated with adolescent delinquency. Others have found that, in general, the timing of family disruption has an effect, and this effect is not limited specifically to the age in which the disruption occurs (Rebellon, 2002). For example, Mott et al. (1997) discovered that recent paternal absence had a more notable effect on behavior in late childhood, particularly for boys.

A meta-analysis by Wells and Rankin (1991) suggests that the difference between delinquency rates of youth in disrupted homes and intact homes ranges from 10 to 15 percent. More recent studies, however, have found no correlation (Paschall et al., 2003) or suggest a much larger one (Rebellon, 2002). Due to myriad methodological variations, such as the way "delinquency" and "family disruption" are measured, a consensus on the actual impact still has not been reached (Wells & Rankin, 1991). Further, despite a general acknowledgment of the negative impact of father absence on delinquency, the actual impact remains in question. Although much literature has been centered on this line of research, few studies have investigated if the timing of paternal absence has an effect on delinquency, and amongst those who have, results are mixed regarding actual effects. While timing appears to be influential in a variety of outcomes including self-esteem (Luo et al., 2012), depressive symptoms (Culpin et al., 2013), and delinquency (Juby & Farrington, 2001; Markowitz & Ryan, 2016; Rebellon, 2002), there is less agreement as to which time period during an individual's development the absence of a father has the greatest impact, if any, on delinquency and arrest.

As discussed previously, the departure of the biological father may act as a life-course transition, altering the trajectory an individual's life follows. Elder (1998) notes, "the developmental impact of a succession of life transitions or events is contingent on when they occur in a person's life" (p. 3). In other words, the impact on the individual may differ depending on the age of the individual when the transition takes place. Timing of father absence may have differing effects on delinquency and these effects may be consequential to future life events and transitions (Elder, 1998). Paternal absence may be more or less impactful depending upon the youth's age and stage of development, and as the life-course perspective suggests, the timing of such an event will likely impact subsequent events. Some suggest that differential impact of timing may be dependent upon the child's ability to process and adjust to new life circumstances at varying stages of development. For instance, familial disruption in early childhood—particularly between birth and age 5—has been highlighted as a possible critical point in the course of child development given the level of reliance children of this age have on their parents or caregivers (Besemer, 2014; Hetherington et al., 1983). Alternatively, it has also been posited that disruption between ages 6 and 13, or middle childhood, may be particularly influential due to the emergence of relationships outside of the family, which may increase peer influence and reduce the ability for parental monitoring (Cavanagh & Huston, 2008; Entwisle & Alexander, 1993).

Further, disruption may act as a turning point, lending to continual negative outcomes through the process of cumulative disadvantage (Besemer, 2014; Elder, 1998; Heard, 2007; Young et al., 2020). For example, research suggests that single-parent homes experience lower household earnings than other family structures (Panico et al., 2010). Lowered financial earnings may lead to a multitude of outcomes, including increased stress amongst those remaining in the home and decreased monitoring of youth. Subsequently, youth may engage in delinquent behaviors as a means of coping with the change (Brezina, 1996). Moreover, these behaviors may have long-term consequences, such that youth may experience negative impacts into adulthood which are tangentially linked to paternal absence. Many of the studies reviewed have focused

on the impact of paternal absence on behavior in adolescence, but few have assessed how this absence may impact later outcomes (Ermisch et al., 2004; Shenk & Scelza, 2012; Young et al., 2020). Shenk and Scelza (2012) found that a father's death longitudinally impacted a variety of outcomes. Particularly, results revealed that paternal death negatively affects children's long-term outcomes, such as educational attainment, income, and marriage. More specifically, paternal death between the ages of 6 and 15 strongly impacted these outcomes. The authors suggest that this time period may be notable because events occurring during this time position the individual for the future. Alternatively, Young and colleagues (2020) found that compared to experiencing parental incarceration after the age of 6, experiencing it before the age of 6 had a larger impact and was significantly related to adult criminal offending. Given the variation in observed effects of timing and the limited research examining possible long-term impacts of it, an exploration of the age range at which father absence is potentially most detrimental will allow for a more in-depth examination of possible developmental mechanisms at work.

Current Study

The purpose of the current study is to examine the impact of the timing of father absence on self-reported delinquency, criminal behavior, and arrest across the life course. Specifically, father absence refers to the biological father no longer residing in the same home as the child—a conceptualization that has been used in prior studies on father absence (Markowitz & Ryan, 2016; TenEyck et al., 2019). Though some prior research has assessed the link between timing of father absence and delinquency (Markowitz & Ryan, 2016; Mott et al., 1997; Rebellon, 2002), the current study will add to the literature by analyzing data spanning over 20 years of development including the adolescence-to-adulthood transition period (Add Health). While prior studies have used the Add Health to examine the impact of family structures on delinquency, the current study will assess the impact of absent father timing on self-reports of delinquency throughout adolescence, adult criminal behavior, as well as a lifetime measure of arrest. The use of self-reports may capture instances of delinquency and criminal behavior that would not necessarily be indicated in official records, as prior research suggests official records of delinquency likely underestimate actual delinquency rates (Juby & Farrington, 2001; Wells & Rankin, 1991). Finally, McLanahan et al. (2013) noted that research examining the effects of father absence into adulthood is limited. By using a longitudinal data set, the current study seeks to assess the long-term consequences of paternal absence on criminal behavior and arrest. Specifically, this study examines if the age of the child when the father departs will have varying effects of delinquency and criminal behavior at different time points across the life course.

Methods

Data

The current study uses data from the National Longitudinal Study of Adolescent to Adult Health (Add Health; Harris, 2009; Harris et al., 2009). The Add Health is a five-wave longitudinal study. Add Health uses a nationally representative sample of youth in grades 7 through 12 during the 1994–1995 academic year. Sampling began with 80 high schools selected from a sampling frame of 26,666. After the high schools were chosen, feeder schools were selected, resulting in 145 middle, junior high, and high schools participating in the study. From the participating schools, 90,118 students completed an in-school survey, which focused on demographic information, school, peers, and general health. From this sample, a subset of students was selected to complete the in-home surveys.

During selection, Black students with college-educated parents, Cuban and Puerto Rican students, Chinese students, and physically disabled students were oversampled. The resulting sample consisted of 20,745 students and 17,670 parents. Wave 1 data was collected through completion of 45-min student and parent interviews. Respondents were asked questions pertaining to demographic information, peers, familial structure, antisocial behaviors, risk and protective factors, health, and education. One year later, Wave 2 in-home interviews were conducted. For this follow-up, the Wave 1 sample was retained, with the exception of the sample of physically disabled students and those who were in grade 12 the year prior. The Wave 2 sample included 14,738 students in grades 8 through 12. Wave 3 follow-up took place in 2001–2002. At the time of follow-up, respondents were between the ages of 18 and 26. The follow-up interview was completed by 15,197 respondents and 1,507 of their romantic partners. Respondents were asked about binge-drinking attitudes, familial and romantic relationships, peer contact, and antisocial behaviors. Wave 4 follow-up occurred in 2008, when cohort members were between 24 and 32 years old. 15,701 respondents participated in a 90-min computer-based survey and 30-min biomarker collection. Data collection for Wave 5 was completed in 2018. The current study will use data from Waves 1 through 4. An examination of missingness revealed that most of the missings were on one or more of the dependent variables (between 25–30%). Furthermore, there were no systematic missing responses (i.e., the missing values were randomly distributed). Despite dropping these cases, a robust sample size remained. Because of this, only those respondents who had no missings at any wave were included in the final sample (i.e., listwise deletion was used). This resulted in a final sample of over 5,000 individuals, which was more than sufficient for statistical power (see Barnes et al., 2020).

Measures

Dependent Variables

Delinquency Wave 1 Following prior studies using the Add Health data (Barnes et al., 2011; TenEyck & Barnes, 2015), 17-items taken from the Wave 1 in-home interviews were included in the measure of Wave 1 delinquency. Respondents were asked if—during the past 12 months—they had painted graffiti, deliberately damaged property, lied to their parents about their location or who they were with, stolen from a store, gotten into a serious fight, hurt someone badly enough they needed medical attention, run away from home, stolen a car, stolen something worth more than 50 dollars, broken into a house or building, used or threatened someone with a weapon to get something from them, sold drugs, stolen something worth less than 50 dollars, engaged in a group fight, acted loud or unruly in a public space, carried a weapon in school, and used a weapon in a fight. All but two items were coded such that 0 = *never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, 3 = *five or more times*. The items concerning carrying a weapon in school and using a weapon in a fight were coded such that 0 = *no*, 1 = *yes*. Scores for each item were summed together to create the Wave 1 delinquency scale, with higher scores representing greater delinquent involvement ($\alpha = 0.86$).

Delinquency Wave 2 During Wave 2 in-home interviews, respondents were asked the same questions asked in Wave 1 pertaining to delinquent involvement. Respondents were asked if they had painted graffiti, deliberately damaged property, lied to their parents about their location or who they were with, stolen from a store, gotten into a serious fight, hurt someone badly enough they needed medical attention, run away from home, stolen a car, stolen something worth more than 50 dollars, broken into a house or building, used or threatened someone with a weapon to get something from them, sold drugs, stolen something worth less than 50 dollars, engaged in a group fight, acted loud or unruly in a public space, carried a weapon in school, and used a weapon in a fight. All but two items were coded such that 0 = *never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, 3 = *five or more times*. The items concerning carrying a weapon in school and using a weapon in a fight were coded dichotomously such that 0 = *no* and 1 = *yes* ($\alpha = 0.83$). This exact scale has been utilized in prior studies examining the Add Health data (TenEyck & Barnes, 2018).

Criminal Behavior Wave 3 During Wave 3 in-home interviews, respondents were once again asked questions concerning criminal involvement. Many questions are similar to those asked in the previous waves, but due to the age of respondents, some questions were different. To create the Wave 3 scale, 12 items referencing the respondent's criminal involvement were used. Similar to Waves 1 and 2, respondents were asked if they deliberately damaged property; stole anything worth less than 50 dollars; stole anything worth more than 50 dollars; used or threatened someone with a weapon; sold drugs; went into a house or building to steal something; fought;

bought, sold, or held stolen property; used a weapon in a fight; carried a weapon; had deliberately written a bad check; and if they used someone's credit card without their permission in the last 12 months. All items were coded such that 0 = *never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, 3 = *five or more times*. Scores for each item were summed together to create the Wave 3 scale, with higher scores representing greater involvement in criminal behavior (α = 0.76). Scholars have previously included these same variables in the measure of criminal behavior at Wave 3 (Beaver, 2008).

Criminal Behavior Wave 4 During Wave 4 in-home interviews, respondents were asked how many times they had engaged in criminal behaviors in the past 12 months. The Wave 4 scale consists of 12 items concerning criminal involvement including: deliberately damaged property, stole something worth less than 50 dollars, stole something worth more than 50 dollars, went into a house or building to steal something, used or threatened someone with a weapon, sold drugs, got into physical fights, took part in a physical fight where a group fought another group, hurt someone bad enough s/he needed care from a doctor, used another person's credit card without their permission, or deliberately wrote a bad check. All items were coded such that 0 = *never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, 3 = *five or more times*. Scores for each item were summed together to create the Wave 4 scale, with higher scores representing greater involvement in criminal behavior (α = 0.75). This exact scale has been utilized in previous research using the Add Health data (TenEyck & Barnes, 2019; Walters & DeLisi, 2013).

Arrest Wave 4 Following the lead of prior Add Health scholars (Pratt et al., 2016), a measure of arrest was taken from the Wave 4 interviews. Specifically, respondents were asked if they had ever been arrested. The item was coded dichotomously such that 0 = *no* and 1 = *yes*.

Key Independent Variables

Biological Father Absence During Wave 1 in-home interviews, respondents were asked how old they were when their father last lived with them. No respondents reported being over 18 years old when they last lived with their biological father. Following prior literature (Markowitz & Ryan, 2016), responses were coded into a series of dummy variables capturing the following categories: *father always present*, *father always absent* (i.e., the father left before birth), *father left from birth to age 5*, *father left from ages 6 to 13, father left from ages 14 to 18*. The *father always present* group will serve as the reference group for the analyses.

Covariates

Low Self-Control Prior scholars have utilized a 23-item, multi-rater indicator of low self-control during Wave 1 interviews (Beaver et al., 2009; Boisvert et al., 2013; Boutwell et al., 2013; Nedelec & Beaver, 2014). Respondents were asked if they argued with anyone, worked hard for what they got, got sad, criticized others, went

out of their way to avoid dealing with difficult problems in their life, tried to solve problems by getting many facts, attempted to find solutions by thinking of many different ways to approach the problem, used a systematic method for judging and comparing alternatives, tried to analyze what went right and wrong when carrying out a solution to a problem, felt like they were doing everything just about right, felt socially accepted, whether difficult problems made them upset, if they went with their "gut feeling" without thinking too much about the consequences, got along with their teachers, paid attention in school, got their homework done, got along with other students, and if they had trouble keeping their mind on what they were doing. The respondent's caretakers were asked if the respondent had a temper, how the respondent's life was going, how well they got along with the respondent, and if they could really trust the respondent. Items were coded such that higher values indicated lower self-control ($\alpha = 0.75$).

Low Intelligence (IQ) During the Wave 1 in-home interview, the respondents were administered the Add Health Picture Vocabulary Test (AHPVT). This test was given on a computer and is an abbreviated version of the well-known Revised Peabody Picture Vocabulary Test. The test consists of 87 items and captures variation in verbal ability and receptive vocabulary, which is accomplished by the interviewer reading the word aloud and the participant selecting an illustration (four black-and-white illustrations were arranged in multiple-choice format) that best fits the word's meaning. The AHPVT raw scores were standardized by age by the Add Health researchers. The AHPVT has previously been used as a measure of verbal intelligence (Beaver et al., 2016; Rowe et al., 1999; Schwartz & Beaver, 2013). The IQ variable was reverse coded so that higher scores represented lower IQ scores.

Low Birth Weight Following other scholars examining the long-term impacts of father separation (Young et al., 2020), low birth weight was included in the analysis. The respondent's birth weight was taken from one question during the Wave 1 parental interview. The question asked the respondent's parent to indicate the respondent's birth weight in pounds. The item was coded so that 0 = *greater than or equal to 5.8 pounds*, 1 = *less than 5.8 pounds*.

Victimization Following prior studies using the Add Health data (see, e.g., Beaver, 2011), victimization was measured using a 5-item scale from Wave 1. Respondents were asked if, in the last 12 months, they had: seen someone be shot or stabbed; had a knife or gun pulled on them; been shot; been cut or stabbed; or been jumped. Items were coded such that 0 = *never*, 1 = *once*, 2 = *more than once.* These items were summed together, with higher scores representing greater victimization ($\alpha = 0.73$).

Depression Depression was measured using 18 items taken from the CES-D depression scale (see Radloff, 1977) in Wave 1. Respondents were asked how often in the past week: they were bothered by things that usually did not bother them, they had a poor appetite, they could not shake off the blues, felt they were as good as other people, felt depressed, felt they were too tired to do things, felt hopeful about the

future, thought their life had been a failure, felt fearful, were happy, talked less than usual, felt lonely, people were unfriendly to them, they enjoyed life, felt sad, felt people disliked them, it was hard to get started doing things, and felt that life was not worth living. These items were summed together, with higher scores indicating greater depression ($\alpha = 0.87$). This exact scale has been used in previous research using the Add Health (Beaver, 2011).

Low Self-Esteem In line with prior research (Merten & Williams, 2014; Oshri et al., 2017), a modified Rosenberg (1965) self-esteem scale was used to measure low self-esteem. During Wave 1, respondents were asked whether they had a lot of good qualities, if they like themselves just the way they are, if they had a lot to be proud of, and if they felt loved and wanted. Items were coded such that 1 = *strongly agree*, 2 = *agree*, 3 = *neither agree nor disagree*, 4 = *disagree*, 5 = *strongly disagree.* Items were summed to create the scale, with higher values indicating lower self-esteem ($\alpha = 0.80$).

Low Social Support Taken from the Wave 1 in-home interviews, 8 items were used to measure social support. Respondents were asked how much they felt adults, teachers, parents, and friends cared about them. They were also asked if people in their family understood them, if they had fun with their family, they want to leave home, and how much their family paid attention to them. Items were coded such that 5 = *not at all*, 4 = *very little*, 3 = *somewhat*, 2 = *quite a bit*, 1 = *very much*. Items were summed to create the scale, with higher values indicating lower social support ($\alpha = 0.79$). Other scholars using the Add Health data have included the same scale when examining delinquent involvement (Beaver, 2011; Daigle et al., 2010).

Delinquent Peers Three items were used to create the delinquent peer scale. During Wave 1, respondents were asked how many of their three best friends smoked one cigarette a day, drank alcohol at least once a month, and used marijuana at least once a month. Variables were coded such that 0 = *no friends*, 1 = *1 friend*, 2 = *2 friends*, 3 = *3 friends* ($\alpha = 0.76$). This scale is identical to one used by previous Add Health researchers (Beaver, 2011; Bellair et al., 2003).

Time Spent with Peers During Wave 1, respondents were asked how often they hung out with friends during the last week. Responses were coded such that 0 = *never*, 1 = *1 or 2 times*, 2 = *3 or 4 times*, 3 = *five or more times*. This measure has been used several times in prior studies (Anderson & Hughes, 2009; Augustyn & McGloin, 2013; Haynie & Osgood, 2005; Meldrum & Barnes, 2017; Thomas & McGloin, 2013).

Neighborhood Disorder Neighborhood disorder was created by summing two variables measured via the parent survey taken during Wave 1. Parents were asked two questions about the extent of problems in the neighborhood: "In this neighborhood, how big a problem is litter or trash on the streets and sidewalks?" and "In this neighborhood, how big a problem are drug dealers and drug users?" Both variables were

coded so that 0 = *no problem at all*, 1 = *a small problem*, 2 = *a big problem*. This exact measure has been used previously (Young et al., 2020).

Low Maternal Attachment In line with prior scholars using the Add Health data (Beaver, 2008; Beaver et al., 2007; Haynie, 2001; Haynie & Piquero, 2006; Schreck et al., 2004), two items from Wave 1 were used to measure maternal attachment. Respondents were asked how close they felt to their mother and how much they thought their mother cared about them. Items were coded such that 1 = *not at all*, 2 = *very little*, 3 = *somewhat*, 4 = *quite a bit*, 5 = *very much*.

Maternal Disengagement Maternal disengagement was measured via 5 items from the Wave 1 interview capturing the level of warmth expressed by the mother, the degree to which the mother talked to the participant when they were in the wrong, the level of encouragement offered by the mother, the participant's level of satisfaction with communication between them and their mother, and the participant's level of satisfaction with their relationship with their mother. To create the scale, responses were summed so that higher values reflected more maternal disengagement ($\alpha = 0.84$). The same measure has been used previously by researchers using the Add Health data (TenEyck & Barnes, 2018).

Low Biological Father Attachment Following the lead of prior researchers using the Add Health data to look at the impact of biological father separation and delinquency/criminal behavior (Porter and King, 2015), a measure of biological father attachment was included. The scale was created by summing four variables asking if respondents: 1) knew anything about their biological father, 2) stayed overnight with their biological father in the last 12 months, 3) communicated with their biological father in the last 12 months, and 4) how close they felt to their biological father. All items were coded so that higher scores indicated *lower* attachment ($\alpha = 0.67$).

Biological Father Death In line with previous research (Young et al., 2020), a measure of biological paternal death was included. During Wave 1, respondents were asked if their biological father was still living. The item was coded so that 0 = *yes* and 1 = *no*.

Parental Permissiveness Parental permissiveness was measured using 7 items from Wave 1. Respondents were asked whether or not they were allowed to make their own decisions concerning: their bedtime; their curfew; their friends; their clothes; their diet; what they watched on television; and how much television they watched. All items were coded dichotomously (0 = *no*, 1 = *yes*). Responses were summed together so that higher values indicated more parental permissiveness ($\alpha = 0.64$). This exact scale has been used previously in Add Health research (Beaver, 2008; Beaver et al., 2007).

Parent Alcoholism Parental alcoholism captured whether one or both of the respondent's biological parents was an alcoholic (0 = *no parent*, 1 = *one parent*,

2 = *two parents*). This measure was included in previous research utilizing the Add Health data and examining father absence (Young et al., 2020).

Low Socioeconomic Status (SES) Low SES was measured during Wave 1 in-home interviews. Respondents were asked if their mother received welfare. Reponses were coded dichotomously such that 0 = *did not receive welfare* and 1 = *received welfare*. This exact same measure has been used in prior research (Barnes & Beaver, 2010; Miller & Barnes, 2015; TenEyck et al., 2019).

Low Maternal Education Low maternal education was measured using one variable taken from the wave 1 in-home parental questionnaire. The item asked the respondent's mother "How far did you go in school?" The item was coded so that higher values indicated lower maternal education. This exact measure has been used before (TenEyck, 2017), and others examining similar research questions have included measures of parental education (Young et al., 2020).

Age Age was measured during Wave 1. Responses ranged from 11 to 21.

Race Race was measured at Wave 1 and was coded as a series of dummy variables where 1 indicated the respondent was either *Black*, *Hispanic*, *Other*, or *White* (0 = *no* and 1 = *yes*).

Sex Respondent's biological sex was obtained during Wave 1 and coded such that 0 = *female* and 1 = *male*. Descriptive statistics for all variables used in the current study can be found in Table 1.

Analytic Plan

The analysis will unfold in a series of interrelated steps. In all, five different models will be analyzed. The models will examine the effects of absent father timing on delinquency at Wave 1 (i.e., model 1), Wave 2 (i.e., model 2), Wave 3 (i.e., model 3), Wave 4 (i.e., model 4), and a lifetime measure of arrest taken at Wave 4 (i.e., model 5).

Negative binomial regression and logistic regression will be used to estimate the impact, if any, of father's absence at four different time points during youths' development on various measures of delinquency and arrest (i.e., measured at different waves), adjusting for a variety of covariates. Since the delinquency variables (i.e., dependent variables) are skewed count data, negative binomial regression accounts for overdispersion (Long, 1997). While Poisson regression may also be used to analyze count data, it was not utilized as its strict assumption that the conditional variance of the dependent variable has to be smaller than the conditional mean is often violated (see Long, 1997). For this reason, negative binomial regression will be utilized. Incident risk ratios (IRR) will be used to interpret the magnitude of the effect. Incident risk ratios can be calculated by converting the coefficient estimates from

Table 1 Descriptive Statistics ($n = 5{,}533$)

	Mean	SD	Min	Max	α
Dependent Variables					
Delinquency W1	4.26	5.26	0	47	0.86
Delinquency W2	3.36	4.35	0	47	0.83
Criminal Behavior W3	0.84	1.85	0	24	0.76
Criminal Behavior W4	0.42	1.30	0	20	0.75
Arrest W4	0.27	0.43	0	1	—
Independent Variables					
Father Always Present	0.69	0.47	0	1	—
Father Always Absent	0.08	0.29	0	1	—
Father Left Early	0.08	0.28	0	1	—
Father Left Mid	0.11	0.32	0	1	—
Father Left Late	0.03	0.18	0	1	—
Covariates					
Low Self-Control	29.33	7.77	3	71	0.75
Low Verbal IQ	21.79	9.95	1	87	—
Low Birth Weight	0.94	0.27	0	1	—
Victimization	0.81	1.48	0	12	0.73
Depression	9.50	6.94	0	51	0.87
Low Self-Esteem	3.05	2.40	0	16	0.80
Low Social Support	8.66	4.44	1	27	0.79
Delinquent Peers	2.26	2.57	0	9	0.76
Time Spent with Peers	2.03	0.97	0	3	—
Neighborhood Disorder	0.97	1.04	0	4	—
Low Maternal Attachment	1.55	1.01	1	9	—
Low Paternal Attachment	0.26	0.66	0	3	0.67
Biological Father Death	0.02	0.17	0	1	—
Maternal Disengagement	8.79	3.37	5	25	0.84
Low SES	0.08	0.27	0	1	—
Low Maternal Education	3.82	1.66	1	8	—
Parent Permissiveness	5.00	1.51	0	7	0.64
Parental Alcoholism	0.17	0.39	0	2	—
Control Variables					
Age	14.94	1.55	11	20	—
Black	0.12	0.39	0	1	—
Hispanic	0.10	0.35	0	1	—
Other	0.05	0.26	0	1	—
White	0.81	0.45	0	1	—
Male	0.47	0.50	0	1	—

Note: SE = Standard Deviation

the negative binomial model and exponentiating them: $IRR = e^{\beta tk}$, where β_{tk} represents the estimated relationship between covariate k and Y at time t. This allows for it to be interpreted as a percentage change in the *rate* of delinquency as a function of a one-unit change in the independent variable. An *IRR* of 1.00 indicates no association, whereas an *IRR* below 1.00 indicates negative association, and an *IRR* above 1.00 indicates positive association. Logistic regression will be utilized to examine the effects of absent father timing on arrest since arrest is a binary measure (i.e., the respondent either had been arrested by Wave 4 or they had not been arrested). Furthermore, odds ratio (*OR*) allows for the examination of the outcome likelihood, and thus, will be used to interpret the magnitude of the effect. Similar to *IRR*, an *OR* of 1.00 indicates no association, an *OR* below 1.00 indicates negative association, and an *OR* above 1.00 indicates a positive association. To account for the oversampling in Wave 1, survey weights will be used in all analyses.

Results

The impact of father absence on criminal behavior and arrest throughout the life course, adjusting for theoretically informed covariates, is presented in Table 2. Table 2 can be read from top to bottom, moving from left to right. The first column lists the independent variables of biological father absence and all covariates—all of which are taken from Wave 1. Of note, the variable of *father always present* is left out as the reference category. The second, third, fourth, and fifth columns report the relationship between the independent variables and Wave 1 delinquency, Wave 2 delinquency, Wave 3 criminal behavior, and Wave 4 criminal behavior, respectively. The final column reports the relationships between the independent variables and arrest.

Recall that during Wave 1 of data collection, respondents were in grades 7 through 12. Results from Model 1 indicate father absence is not significantly related to delinquency in Wave 1, after the introduction of the aforementioned covariates. Several covariates, however, are significantly related to Wave 1 delinquency. For example, a one-unit increase in low self-control is associated with a 4 percent increase in the rate of delinquency ($IRR = 1.04$, $p < 0.05$), while a one-unit increase in prior victimization is related to a 24 percent increase in the rate of delinquency ($IRR = 1.24$, $p < 0.05$). Low self-esteem is negative and significantly related to adolescent delinquency, with each one-unit increase in low self-esteem reducing the rate of delinquency by 4 percent ($IRR = 0.96$, $p < 0.05$). Additionally, low social support ($IRR = 1.04$, $p < 0.05$), delinquent peers ($IRR = 1.10$, $p < 0.05$), and time spent with peers ($IRR = 1.12$, $p < 0.05$) are all related to an increase in the rate of Wave 1 delinquency. Examining demographic characteristics, while age ($IRR = 0.95$, $p < 0.05$) is related to a decrease in the rate of delinquency, being Hispanic ($IRR = 1.30$, $p < 0.05$) or male ($IRR = 1.17$, $p < 0.05$) increases the rate of delinquency at Wave 1.

Model 2 reports the effects of father absence on Wave 2 delinquency, while adjusting for various covariates. Similar to results shown in model 1, father absence is not significantly related to Wave 2 delinquency. Once again, several covariates, such as low self-control ($IRR = 1.03$, $p < 0.05$) and victimization ($IRR = 1.17$,

Table 2 The Impact of Father Absence on Criminal Behavior and Arrest ($n = 5{,}533$)

	Delinquency Wave 1		Delinquency Wave 2		Criminal Behavior Wave 3		Criminal Behavior Wave 4		Arrest Wave 4	
	IRR	SE	IRR	SE	IRR	SE	IRR	SE	OR	SE
Father Always Absent	0.88	0.06	0.93	0.09	1.09	0.19	1.55*	0.31	1.06	0.18
Father Left Early	1.07	0.09	1.16	0.09	1.46*	0.25	1.32	0.3	1.40*	0.23
Father Left Mid	0.98	0.06	0.97	0.08	1.07	0.16	1.14	0.23	1.26	0.19
Father Left Late	0.89	0.11	0.87	0.12	1.13	0.28	1.02	0.31	1.82*	0.36
Low Self-Control	1.04*	0.01	1.03*	0.01	1.01	0.01	1.03*	0.01	1.03*	0.01
Low I.Q	1.00	0.01	1.00	0.01	0.99	0.01	0.99	0.07	1.02*	0.01
Low Birth Weight	1.00	0.09	1.10	0.12	0.65	0.14	0.92	0.23	1.01	0.22
Victimization	1.24*	0.02	1.17*	0.02	1.10*	0.03	1.12*	0.04	1.17*	0.04
Depression	1.01	0.01	1.00	0.01	0.99	0.01	1.01	0.01	0.98*	0.01
Low Self-Esteem	0.96*	0.01	0.98*	0.01	0.99	0.02	0.94	0.03	1.02	0.02
Low Social Support	1.04*	0.01	1.02*	0.01	1.01	0.02	1.04	0.02	1.02	0.01
Delinquent Peers	1.10*	0.01	1.07*	0.01	1.04*	0.03	1.07*	0.03	1.12*	0.02
Time Spent With Peers	1.12*	0.02	1.10*	0.03	1.07	0.04	0.97	0.06	1.25*	0.06
Neighborhood Disorder	0.99	0.02	0.99	0.02	0.96	0.04	1.04	0.06	1.02	0.05
Low Maternal Attachment	1.01	0.02	0.99	0.03	1.11*	0.05	0.97	0.05	1.09	0.07
Low Paternal Attachment	1.02	0.03	1.03	0.04	0.88	0.06	1.01	0.09	1.06	0.08
Paternal Death	0.91	0.09	1.02	0.13	0.75	0.15	0.78	0.23	0.55*	0.16
Maternal Disengagement	1.01	0.01	1.01	0.01	1.02	0.01	1.03	0.03	0.96*	0.02
Low SES	0.92	0.06	0.98	0.09	1.02	0.13	0.93	0.17	1.21	0.21
Low Maternal Education	0.98	0.01	0.97	0.01	0.92*	0.03	1.01	0.05	1.05	0.03
Parental Permissiveness	1.01	0.01	1.03*	0.01	1.08*	0.03	1.09*	0.04	1.02	0.03
Parental Alcoholism	0.96	0.04	1.00	0.06	1.08	0.11	0.90	0.12	1.19	0.14
Age	0.95*	0.01	0.89*	0.01	0.76*	0.02	0.79*	0.03	0.91*	0.03
Black	1.03	0.1	0.88	0.09	1.53*	0.22	1.20	0.32	1.40	0.35
Hispanic	1.30*	0.08	1.31*	0.11	1.13	0.18	1.10	0.22	0.79	0.13
Other	0.94	0.1	1.09	0.13	1.33	0.33	1.12	0.39	1.04	0.31
White	0.88	0.08	0.92	0.09	1.04	0.14	0.85	0.2	0.94	0.2
Male	1.17*	0.04	1.14*	0.06	3.04*	0.28	2.77*	0.28	3.49*	0.41

*$p < .05$; Note: IRR = Incidence Risk Ratio; OR = Odds Ratio; SE = Linearized Standard Error

$p < 0.05$) are significantly related to delinquency. Having low self-esteem decreases the rate of delinquency at Wave 2 ($IRR = 0.98$, $p < 0.05$), while low social support is related to an increase in the rate of Wave 2 delinquency ($IRR = 1.02$, $p < 0.05$). Additionally, both having delinquent peers ($IRR = 1.07$, $p < 0.05$) and spending time with peers ($IRR = 1.10$, $p < 0.05$), whether delinquent or not, appears to increase the rate of delinquency in adolescence. Parental permissiveness is also associated with a 3 percent increase in the rate of adolescent delinquency ($IRR = 1.03$, $p < 0.05$). Once again, similar to Wave 1, age ($IRR = 0.89$, $p < 0.05$) is related to a decrease

in delinquency, while being Hispanic ($IRR = 1.31$, $p < 0.05$) or male ($IRR = 1.14$, $p < 0.05$) is related to an increase in Wave 2 delinquency.

The third model reveals that departure of biological father between birth and age 5 (i.e., father left early) is significantly related to Wave 3 criminal behavior. Specifically, departure of the father at this time appears to be associated with a 46 percent increase in criminal behavior in early adulthood ($IRR = 1.46$, $p < 0.05$). Victimization ($IRR = 1.10$, $p < 0.05$), delinquent peers ($IRR = 1.04$, $p < 0.05$), and low maternal attachment ($IRR = 1.11$, $p < 0.05$) are related to a 10 percent, 4 percent, and 11 percent increase, respectively, in criminal behavior at Wave 3. Low maternal education is negative and significantly associated with criminal behavior, suggesting that a one-unit increase in low maternal education decreases the rate of criminal behavior by 8 percent ($IRR = 0.92$, $p < 0.05$). Parental permissiveness in adolescence appears to be related to an increase in criminal behavior in early adulthood ($IRR = 1.08$, $p < 0.05$). Again, age is related to a decrease in criminal behavior, with each additional year decreasing the rate of criminal behavior by 24 percent ($IRR = 0.76$, $p < 0.05$). In early adulthood, Black respondents experience a 53 percent increase in the rate of criminal behavior ($IRR = 1.53$, $p < 0.05$). Additionally, being male is significantly related to criminal behavior, with males experiencing a 204 percent ($IRR = 3.04$, $p < 0.05$) increase in the rate of criminal behavior during early adulthood.

As can be seen in Model 4, never living with the biological father at any point before the age of 18 (i.e., father always absent) is positive and significantly related to criminal behavior in later adulthood (i.e., Wave 4). Biological father absence prior to birth is associated with a 55 percent increase in criminal behavior during later adulthood ($IRR = 1.55$, $p < 0.05$). Similar to prior waves, low self-control ($IRR = 1.03$, $p < 0.05$), victimization ($IRR = 1.12$, $p < 0.05$), and delinquent peers ($IRR = 1.07$, $p < 0.05$) remain positive and significantly related to criminal behavior. In addition, parental permissiveness in adolescence is related to a 9 percent increase in criminal behavior in later adulthood ($IRR = 1.09$, $p < 0.05$). There appears to be no significant effect of race or ethnicity during Wave 4, but age and male remain statistically significant, with age decreasing criminal behavior ($IRR = 0.79$, $p < 0.05$) and male increasing criminal behavior ($IRR = 2.77$, $p < 0.05$).

Model 5 reports the effects of father absence on arrest, while adjusting for various covariates. As can be seen, father absence between birth and age 5, as well as between ages 14 and 18, is significant and positive in relation to arrest. Father absence between birth and age 5 is associated with a 40 percent increase in the likelihood of being arrested ($OR = 1.40$, $p < 0.05$), while father absence between age 14 and age 18 is related to an 82 percent increase in the likelihood of being arrested ($OR = 1.82$, $p < 0.05$). Low self-control ($OR = 1.03$, $p < 0.05$), low IQ ($OR = 1.02$, $p < 0.05$), and victimization ($OR = 1.17$, $p < 0.05$) are positive and significantly related to arrest. Depression ($OR = 0.98$, $p < 0.05$) decreases the likelihood of ever being arrested, while having delinquent peers ($OR = 1.12$, $p < 0.05$) and time spent with peers ($OR = 1.25$, $p < 0.05$) increase the likelihood of reporting ever being arrested. Both paternal death ($OR = 0.55$, $p < 0.05$) and maternal disengagement ($OR = 0.96$, $p < 0.05$) appear to decrease the likelihood of ever being arrested by 45 percent and 4 percent, respectively. Finally, similar to criminal behavior in Wave 4,

the only demographic characteristics significantly related to ever being arrested are age ($OR = 0.91$, $p < 0.05$) and being male ($OR = 3.49$, $p < 0.05$).

Sensitivity Analyses

To examine whether there were any significant differences between the estimated coefficients, a coefficient test was applied to all statistically significant key independent variables. The purpose was to determine if there were any differences among the groups representing when father's absence occurred (i.e., early, middle, late). Recall from Table 2 that Wave 3 and 4 criminal behavior and arrest were the only models to have significant coefficients for timing of father's absence. A series of coefficient tests indicated that there were no statistically significant differences among the coefficients measuring timing of father's absence. In other words, the coefficient tests indicate that there is no difference in the measures for timing of father's absence.

Although prior literature was utilized to determine the age cutoffs for when the biological father leaves, one could argue that the age cutoffs are somewhat arbitrary. For this reason, a series of sensitivity tests were analyzed where the age cutoffs will be slightly different. Recall that the original age groups ranged from 0–5 years old for leaving early (9.31% of the entire sample), 6–13 years old for middle childhood through early adolescence (11.82%), and 14–18 years old for leaving in late adolescence (5.36%). Specifically, three sensitivity tests were performed. First, all models were reanalyzed with the categories altered so that they started a year earlier, for instance, early was defined as ages 0–4 (now 7.30% of the entire sample), middle was 5–12 (12.12%), and late was ages 13–18 (7.00%). Second, all models were reanalyzed with the age groups changed to a year later, such that early was 0–6 (now 10.70% of the entire sample) years old, 7–14 (11.91%) years old for middle, and 15–18 (3.88%) years old for late. Third, a completely new age spread was analyzed in which the groups ranged from 0–3 (5.91% of the entire sample) for early, 4–10 for middle (10.50%), and 11–18 for late (10.01%). Results from these analyses remained relatively unchanged from those reported above. Importantly, the overall findings remain the same. Mainly that father absence was related to criminal behavior in adulthood (i.e., Wave 4) and the lifetime measure of arrest. To be sure, the results were not "sensitive" to changes in the ages used to classify the groups.

Additionally, it could be that although the biological father is absent, the presence of another male fulfilling the role of a father figure would negate the effects of biological father absence. To further explore this, the models were reanalyzed controlling for father figure. During Wave 1, youth were asked to provide a roster of individuals that made up their household and to best describe their relationship with each individual. To construct the variable "father figure," a summated measure was created from all non-biological male figure responses—including stepfather, adoptive father, step/adoptive father, and foster father. All five models were reanalyzed with father figure added to each model. Two key findings emerged: 1) father figure was not significant in any model and 2) the results from these analyses remained relatively unchanged from those above (i.e., the significance of key variables remained unchanged after accounting for the presence of a non-biological

father figure). Additionally, for respondents reporting their biological father leaving the same year as they completed the Wave 1 survey, there may have been temporal issues. To address this concern, all cases in which a respondent reported their father leaving at the same age the respondents were when they were at Wave 1 *and* reported at least one delinquent act in the same year were to be dropped. Importantly, though, there were no respondents who met the criteria. Since none of these individuals reported delinquency during that year, there should be no temporal issues in the results presented.

Lastly, recall that the current analysis uses father absence that was reported in Wave 1. To examine whether father absence reported after Wave 1 impacted the reported findings, all individuals who reported a living status change for their biological father in Wave 2 ($n=691$) were dropped from the sample. Once conducting the complete analysis without these individuals, the results remained unchanged. This indicated that those who reported father absence later on (i.e., Wave 2), did not impact the findings. To further examine this, a new variable was created which captured all individuals who reported their biological father leaving after the first wave of data collection. The models were then analyzed to see if this variable was related to delinquency Wave 2, criminal behavior Wave 3, criminal behavior Wave 4, and lifetime arrest (captured at Wave 4)—Wave 1 could not be analyzed due to temporal ordering—controlling for all the Wave 1 predictors included in the original analysis. Results revealed that biological fathers leaving between Waves 1 and 2 was not significantly related to Wave 2 delinquency, Wave 3 criminal behavior, Wave 4 criminal behavior, and arrest. Again, the key findings remained unchanged indicating that those who reported their biological father leaving after Wave 1 did not impact the results.

Discussion

Much research has focused specifically on youth in father absent homes and found that biological father absence negatively impacts youth behavioral outcomes (McLanahan et al., 2013; Rebellon, 2002). Despite the large amount of literature on the subject, there remains inconclusive evidence on the actual effects of father absence (Austin, 1978; Harper & McLanahan, 2004; Kim & Glassgow, 2018; McLanahan et al., 2013; Mott et al., 1997). In addition, little research has examined the influence of the timing of father absence as a youth and its impact on future behavioral outcomes. Those who have examined timing of father's absence have reported mixed results concerning when paternal departure is most impactful—suggesting that more research is needed (Markowitz & Ryan, 2016; Shenk & Scelza, 2012; Young et al., 2020).

The current study sought to examine whether biological father absence impacted the rate of delinquency, criminal behavior, and the likelihood of arrest across the life course generally, and if the effect of biological father absence on criminal behavior would remain constant across the life course. Results revealed that father absence was related to an increase in criminal behavior during early adulthood (i.e., Wave 3), later adulthood (i.e., Wave 4), and a lifetime measure of arrest—but not during

adolescence (i.e., Waves 1 and 2). Such findings highlight the necessity to examine criminal behavior across the life course, as conducting the same analysis without analyzing adult outcomes would have suggested that biological father absence is of little to no importance. The results also demonstrate the importance of looking at arrest in addition to general criminal behavior.

Findings from the current study demonstrate the importance of looking at longitudinal data, as no effect would have been seen if cross-sectional data had been used (Rutter, 1988). Notably, father absence was related to criminal behavior in adulthood but not in adolescence. One explanation for this lies in the concept of cumulative disadvantage—that is, the coalescence of disadvantages across the life course result in larger effects in adulthood (Sampson & Laub, 1997). In other words, father absence has small effects in childhood that result in the larger observed effects in adulthood. For example, the father's absence may lead to a lower household income which forces the youth to work in adolescence rather than focusing on school or causes them to have insufficient funds to continue their education. Thus, the father's absence may be a negative turning point or transition which alters their life trajectory, affecting them later in life. Findings indicate that father absence at any point may act as this turning point, as no time period was more impactful than the other.

In terms of the effect of timing of biological father absence, there was no clear pattern of the age at which the individual was when their biological father left on delinquency, criminal behavior, or arrest. Specifically, there was no relationship between father leaving at any age on delinquency at Waves 1 and 2. Having a biological father that left before birth was related to an increase in criminal behavior in later adulthood, whereas having a father that left earlier in life was related to an increase in criminal behavior in early adulthood as well as arrest. Biological father absence later in adolescence, however, was only associated with a lifetime measure of arrest. There are a few reasons why the time at which the biological father left did not have a clear effect—or pattern. This may be due in part to the idea that absence in general may decrease control. Recall that it is presumed that intact family structures hold an increased ability to enact and maintain control over youth behavior (Gottfredson & Hirschi, 1990; Hirschi, 1969; Nye, 1958; Reiss, 1951). Along this line of thinking, it could then be posited that father absence at any point in time would decrease the likelihood of direct and indirect control being established. In other words, regardless of when the absence occurs, parental control would either never be established or would fail to be maintained, thus increasing the likelihood of individuals engaging in criminal behaviors in adulthood.

Although this study adds to the current literature concerning father absence, there are a few limitations that must be acknowledged. First, the current study does not control for genetic influences. Research indicates that genetics account for around 50 percent of the variance of all traits (Polderman et al., 2015). By not accounting for genetic factors, a complete picture of the mechanisms influencing the observed outcome fails to be seen. Second, the current study assesses the impact of father absence, in general, on delinquency, criminal behavior, and arrest but does not distinguish between reasons for the absence beyond controlling for paternal death. Prior literature has examined varying absences (e.g., divorce or incarceration) and have often found differing effects based on absence type (Harper & McLanahan,

2004; Juby & Farrington, 2001; Rebellon, 2002; Young et al., 2020). An examination of varying absence types may yield results different than those found here. It is also important to note that the current study uses a measure of timing that relies on respondent memory recall, which may be inaccurate. While it is possible that error may be present in the accuracy of the recollection, there is evidence to suggest that youth have the ability to fairly accurately recall early experiences (Fivush & Schwarzmueller, 1998; Fivush et al., 1987; Peterson et al., 2011; Reuben et al., 2016). Further, evidence has shown that distinct life events and experiences—like a biological father leaving—are able to be more readily and accurately recalled (Fivush & Schwarzmueller, 1998; Hudson et al., 1992). Lastly, guided by life-course theories, dynamic variables were used as controls in the current study. While the current study was unable to determine the exact processes at work, experiencing victimization and having delinquent peers in adolescence was related to a significant increase in delinquency, criminal behavior, and arrest throughout the life course—signifying the importance of adolescent dynamic factors in the etiology of adult criminal behavior and arrest. Future studies should seek to further unpack the relationship between dynamic variables and behavior later on in the life course.

Despite these limitations, findings from the current study highlight the importance of examining behavior across the life course. An adolescent-limited view fails to reveal the long-term effects of family disruption and may diminish the prioritization of family preservation programming (Cullen, 2011). Results suggest that programs aimed at reducing delinquency and criminal behavior take into account the long-term impact of biological father absence. To be sure, the current study found no link between having an absent father at any time point in adolescence, but it was related to criminal behavior and arrest in adulthood. These findings indicate that having an absent biological father may alter one's life-course trajectory in such a way that leads them down a delinquent path. Criminal behavior is not limited to adolescence, and as this study shows, neither are the effects of father absence.

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