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INVESTIGATING THE LONGITUDINAL RELATION BETWEEN OFFENDING FREQUENCY AND OFFENDING VARIETY

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Abstract

Researchers interested in longitudinal patterns of criminal offending have paid close attention to several dimensions of criminal careers. Although it might be expected that several dimensions are strongly linked to one another, research has not explored their joint distribution. The study uses trajectory-based methodology to examine the joint relation between offending variety and offending frequency in a large sample of serious offenders from adolescence to early adulthood and also tests how several risk factors relate to the joint covariation between variety and frequency. Results indicate strong concordance between low and high rate variety and frequency trajectories but a more modest concordance among moderate rate variety and frequency trajectories. Criminal history, individual, parent, and peer characteristics predict differences in concordance between variety and frequency trajectories. Theoretical implications and directions for further research are outlined.

Keywords

offending; frequency; variety; life-course; trajectories

Descriptions of criminal offending patterns are a cornerstone of the history of criminology (Shaw, 1930; Tracy, Wolfgang, & Figlio, 1990; Wolfgang, Figlio, & Sellin, 1972). Both qualitative and quantitative research on the longitudinal patterning of criminal careers has led to the identification of important characteristics of crime and criminals (Braithwaite, 1989; Laub & Sampson, 2003) that has served as the backbone of many criminological (Gottfredson & Hirschi, 1990) and developmental/life-course (DLC; Farrington, 2003; Moffitt, 1993) theories. Based on the literature (Farrington, 2003), there are 10 widely accepted tenets about the development of offending: (a) The age of onset of offending is typically between ages 8 and 14; (b) the prevalence of offending peaks between ages 15 and 19; (c) an early age of onset predicts a long criminal career characterized by a high frequency of offenses; (d) there is marked continuity in offending and antisocial behavior from childhood to adolescence to adulthood; (e) a small number of offenders have an early onset of offending, a high offending frequency, and a long criminal career; (f) offending is more versatile than specialized; (g) the types of offenses individuals commit are elements of a larger syndrome of antisocial behavior; (h) as people enter adulthood, they transition from group offending to solo offending; (i) prior to age 20, offending appears to be due to emotional (e.g., excitement, enjoyment, and boredom) and utilitarian reasons, whereas after age 20, utilitarian motives become increasingly dominant;

and (j) offending follows a general progression, beginning with relatively minor offenses, increasing in relative seriousness of offending and, after age 20, decreasing diversification of offending and increasing specialization of offending.

As a way of organizing and unifying these conclusions surrounding the various dimensions of criminal offending over the life course, the criminal career framework has emerged as an important descriptive tool (Blumstein, Cohen, Roth, & Visser, 1986). Although this framework pays close attention to a number of characteristics of offending, such as participation, frequency, offense switching, escalation, seriousness, duration, co-offending, and desistance, only some of these dimensions have been the focus of sustained research (Piquero, Farrington, & Blumstein, 2003). For example, much research has focused on the frequency of offending throughout criminal careers as well as the nature and type of involvement in certain types of crime (and how involvement switches across those types) over the life course. Indeed, the seminal Rand Second Inmate Survey (Chaiken & Chaiken, 1982; Spelman, 1994), an offender-based recall study of the criminal careers of more than 2,000 inmates in Michigan, Texas, and California, found that frequency and variety were strongly related, as high-rate (high-frequency) offenders switched offenses often (engaged in a variety of crime types) over a 3-year recall period. Yet, little research has been under-taken with respect to how frequency and variety are specifically linked (covary), nor has research attempted to understand the determinants of the joint distribution of these two criminal career dimensions.

The empirical study of offense frequency and offense variety bears directly on central theoretical matters related to offending. Although criminal career researchers do not posit that frequency and variety have complete concordance, other theoretical models do make such a claim. DLC criminologists, for example, would predict that frequency and variety are closely related (Le Blanc & Loeber, 1998; Loeber & Le Blanc, 1990). Moffitt's (1994) developmental taxonomy, and in particular the hypothesis concerning life-course-persistent offenders, offers a strong statement with regard to how seven specific dimensions of offending should be positively related, including "frequency or rate of offending" and "variety of heterotypic activities in the antisocial spectrum." For Moffitt (1994), then, life-course-persistent offending is marked by both a higher frequency of offenses and participation in a wide variety of offense types.

Although often pitted against life-course theories, Gottfredson and Hirschi's (1990) general theory of crime also shares a similar prediction with respect to the relation between offense frequency and variety. Specifically, because these theorists argue that all offending dimensions are inextricably linked, they anticipate no differences across the patterning of dimensions. Furthermore, because the different criminal career dimensions have a common etiological cause (low self-control) within the framework of the general theory of crime, offenders who engage in many offenses will also engage in a variety of criminal acts (Hirschi & Gottfredson, 1995). In short, on these two dimensions of the criminal career framework, both DLC theory and Gottfredson and Hirschi's general theory, which typically make vastly different predictions about the causes of offending, coalesce on the same hypothesis concerning the strong, positive relationship between offense frequency and offense variety.

Although theoretically, variety and frequency should be highly correlated, virtually no research has examined this prediction empirically. In the only study to directly examine the joint relationship between offense frequency and offense switching, Brame and colleagues (Brame, Paternoster, & Bushway, 2004) used data from the 1945 Philadelphia Birth Cohort to test the hypothesis that high-frequency offenders are more inclined to switch between violent and nonviolent offending than low-frequency offenders. Specifically, they tested two models; the first model anticipated that high- and low-rate offenders would demonstrate variation in their proclivity for versatile offending, whereas the second model predicted that high- and low-rate

offenders would have similar offense-switching (offending variety) tendencies. They found that the probability of offense switching and offending frequency were independent of each other; that is, “high-rate offenders [we]re no more likely to switch offense types than low-rate offenders” (p. 209) or “high-rate offenders d[id] not exhibit a greater tendency toward versatile offending” (p. 211). That is, frequency and variety showed little concordance.

Although Brame and colleagues (2004) made an important contribution, several limitations preclude making any definitive statements with respect to the patterning of frequency and variety. First, their data consisted of a birth cohort, which, although important with respect to generalizability, may limit the necessary amount and type of offending needed to fully assess the joint covariation between frequency and variety. Second, their analysis did not focus on the variety of offending per se, instead looking at offense switching across two broad categories: violent and nonviolent crime. Third, the analysis did not examine the correlates of frequency and variety, thus they could not examine how key risk factors related to the joint relationship between the two criminal career dimensions. Given that the relation between variety and frequency is a tenet of many theoretical frameworks, research is needed exploring their covariation.

In addition to the limited knowledge about the correlation between variety and frequency of offending over time, it is also unclear if variables that predict offending in one dimension can similarly distinguish among offending in the other dimension. That is, many studies have identified robust predictors of variety and frequency, but it is unclear how useful these predictors are in delineating among joint trajectories of variety and frequency. Indeed, in the criminological literature, a number of characteristics are robust predictors of offending: offending history (Loeber, 1982), resistance to peer influence (Brown, Clasen, & Eicher, 1986), substance use and abuse (Grisso, 2004; O'Donnell, Hawkins, & Abbot, 1995), peer deviance (Elliott & Menard, 1996; Lipsey & Derzon, 1998), and poor parenting (Chung & Steinberg, 2006; Steinberg, Blatt-Eisengart, & Cauffman, 2006). It remains unclear, however, if and how well these factors will delineate among joint variety and frequency trajectories. To the extent that variety and frequency covary, it is important to evaluate if these predictors can explain variation in concordance between variety and frequency.

This study seeks to overcome the limitations of past research by (a) studying patterns of frequency and variety; (b) examining how these two criminal career dimensions relate to one another over time in a sample of serious youthful offenders, a policy-relevant sample that ensures greater diversity in offending and also provides clearer policy implications on persistence or desistance from offending and its correlates (Laub & Sampson, 2001); and (c) assessing how key risk factors relate to the joint relationship of frequency and variety.

METHOD

PARTICIPANTS

Participants were males enrolled in the Research on Pathways to Desistance study (Mulvey et al., 2004), a prospective study of serious juvenile offenders in Phoenix, Arizona (Maricopa County; $N = 654$), and Philadelphia, Pennsylvania (Philadelphia County; $N = 700$) (see Schubert et al., 2004, for complete details of study methodology). Adolescents were eligible for study participation if they were between 14 and 17 years of age at the time of a felony or similarly serious nonfelony offense (e.g., a misdemeanor weapons offense, misdemeanor sexual assault) of which they were convicted. Because a large proportion of offenses committed by adolescents are drug offenses, at each site only 15% of the enrolled cases could be due to a drug offense. Second, all youth whose cases were being considered for trial in the adult system were eligible for enrollment (even if the offense was a drug offense). At the outset of the study, 3,807 individuals were eligible for enrollment; however, we did not attempt to contact some

of these youth because (a) there was not an available interviewer or (b) we were approaching the predetermined cap of 15% drug offenders (for further details, see Schubert et al., 2004). The research staff attempted to contact 2,008 adolescents, and of those contacted, 67% agreed to participate in the study ($N = 1,354$). It is important to note that compared with nonenrolled youths, enrolled participants had more prior petitions (i.e., arrests leading to formal charges) (2.1 vs. 1.5 for nonparticipants), were somewhat younger at first petition (13.9 vs. 14.2 years for nonparticipants), were somewhat younger at adjudication (15.9 vs. 16.1 years for nonparticipants), and were somewhat more likely to be non-Hispanic Caucasian (25% vs. 20% for nonparticipants) compared with youth who declined to participate. Although statistically significant, these differences are modest in magnitude.

The baseline interview was conducted an average of 36.9 days ($SD = 20.6$) after participants' adjudication (for those in the juvenile system) or their decertification (i.e., waiver) hearing in Philadelphia or an adult arraignment in Phoenix (if in the adult system). These analyses are limited to males because there was an insufficient number of females to analyze. The analytic sample was further reduced to include only males who had completed at least 50% of the interviews over the 5-year study period. The final analytic sample consisted of 1,105 males (50% from Phoenix, 50% from Philadelphia). At the time of the baseline interview, these participants were on average 16.5 years of age ($SD = 1.11$) and predominantly lower socioeconomic status (SES), with fewer than 4.5% of the participants' parents holding a 4-year college degree, and 40% of participants' parents having less than a high school education. Forty-one percent of the participants were African American, 35% Hispanic American, 20% non-Hispanic Caucasian, and 4% other ethnicities.

PROCEDURES

Juvenile courts in each locale were reviewed to identify the names of eligible adolescents (based on age and adjudicated charge). Interviewers then attempted to contact each eligible juvenile and a parent or guardian to ascertain the juvenile's interest in participation and obtain parental consent. Interviews were conducted in a facility (if the juvenile was confined), the juvenile's home, or a mutually agreed-on location in the community.

The baseline interview was administered over 2 days in two 2-hour sessions. Interviewers and participants sat side-by-side facing a computer, and questions were read aloud to avoid comprehension problems or variation in reading ability. When interviews were conducted in participants' homes or in community settings, attempts were made to conduct them out of the earshot of other individuals. Honest reporting was encouraged, and confidentiality was reinforced by informing participants of the requirement for confidentiality placed on the study by the U.S. Department of Justice, which prohibited the disclosure of any personally identifiable information to anyone outside the research staff. (Youth were informed that the only exceptions to confidentiality were if the participant expressed plans to hurt himself or someone else, described a specific plan to commit a crime in the future, disclosed that someone is in jail for a crime the participant committed, or if child abuse is suspected.) All recruitment and assessment procedures were approved by the Institutional Review Boards of the participating universities, and youth were paid \$50 for their participation in the baseline interview (when allowed by facility rules).

The follow-up interviews were each completed in one 2-hour session, and participant compensation increased at each time point (up to \$150 per interview). Subjects were reinterviewed every 6 months following the baseline interview for 3 years. After the 36-month post-baseline follow-up interview, participants were interviewed every year (48-month follow-up). Attrition for the analytic sample was low: 841 individuals completed eight interviews, 162 youth completed seven interviews, 67 youth completed six interviews, 32 youth completed five interviews, and 3 youth completed four interviews. (Remember that individuals were

excluded from analyses if they completed fewer than four interviews.) To create uniform time measurement, data from the 6- to 36-month follow-up interviews were combined into year-long intervals (e.g., 6 month and 12 month, 18 month and 24 month, and 30 month and 36 month; individuals had to provide data at both time points). With the addition of the 48-month data, these analyses cover a total of five time points, each interview 1 year apart for a total of 5 years.

MEASURES

To examine patterns of offending over time, we used measures of offending frequency and offending variety. Because incarceration can affect the opportunity to engage in antisocial behavior, we used a measure of the amount of time the adolescent spent in the community, as opposed to being incarcerated or in some other secured facility, as a covariate in the analyses (Piquero et al., 2001). Subsequent to identifying patterns of antisocial behavior over time, we predicted patterns of antisocial behavior with measures of criminal history, individual characteristics, peer characteristics, and family characteristics (see Loeber & Farrington, 1998).

Antisocial behavior—The Self-Report of Offending (SRO; Huizinga, Esbensen, & Weiher, 1991) was used to measure involvement in both antisocial and illegal activities. Participants reported if they had been involved in any of 22 aggressive or income-generating crimes (e.g., “Taken something from another person by force, using a weapon”; “Used checks or credit cards illegally”). At the baseline and 48-month interviews, these 22 items were asked at each time point with the qualifying phrase, “In the past 12 months, have you ... ?” At the 6-month through 36-month follow-up interviews, these questions were asked with the qualifying phrase, “In the past 6 months, have you ... ?” (these responses were summed across time points to create measures of year-long antisocial activity). Subsequent to this question at all time points, participants were asked to report how many times in the recall period they had engaged in each criminal act.

Two different but related (Hindelang, Hirschi, & Weis, 1981) ways of assessing criminal activity were calculated: variety scores and frequency scores. Variety scores are based on a count of 22 different types of crimes that an individual endorses, and the number of different types of crime an individual reported at each recall period is calculated. Offending variety scores are a common method of examining offending and have several desirable features (Moffitt, Caspi, Rutter, & Silva, 2001): (a) They capture involvement in multiple forms of crime so that trivial forms of behavior do not overweight the measure; (b) they have better distributional properties for analyses than frequency scores (less skewness); (c) they predict future delinquency; (d) they show the extent of involvement in different types of crimes, which has been found to be a highly reliable predictor of future antisocial outcomes; (e) they are more accurate and reliable than frequency measures, especially with respect to recall errors made by frequent and aggressive offenders; and (f) they are the preferred measure according to the classic study (Hindelang et al., 1981) on delinquency assessment. Frequency scores were also calculated by summing the number of different times an individual committed a crime (regardless of type of criminal activity). Given the large range of frequency scores at each time point, within each age group, frequency scores were trimmed to the 90th percentile (Nagin & Smith, 1990). Because frequency scores still had a large range (more than 300), each score was divided by 10. Thus, each unit of offending frequency represents 10 offenses.

Exposure time—Because incarceration can limit opportunity to engage in antisocial acts and failure to account for this can affect the derived solution when examining offending (Piquero et al., 2001), all analyses controlled for exposure time, the proportion of time in a year an individual was in the community (i.e., not in a detox/drug-treatment program,

psychiatric hospital, residential treatment program, or secure institution). This information was not available at the baseline interview, so all values were set to 1 (Nagin, 2005).

Predictors of Trajectory Group Membership

Criminal history—Two measures of prior criminal history were used to predict trajectory group membership: age at first arrest and number of official petitions to court prior to the baseline interview. Reviews of official court records were used to calculate the age at a participant's first arrest. If the juvenile's first offense was the one that made him eligible for study enrollment, age at the baseline interview was used for age of first court referral. Official court data were also used to determine the number of petitions sent to court of each youth prior to being enrolled in the study.

Individual characteristics—Two domains of individual characteristics were of interest in this study: resistance to peer influence and alcohol or drug dependency, all of which were used to predict differences among joint trajectory groups.

Resistance to peer influence (Steinberg & Monahan, 2007) was used to assess an individual's ability to interact with peers autonomously. Using a procedure developed by Harter (1985), participants are read two conflicting scenarios (e.g., "Some people go along with their friends just to keep their friends happy," but "Other people refuse to go along with what their friends want to do, even though they know it will make their friends unhappy") and are asked to select (a) which statement is more like them and (b) the strength of that statement (*sort of true* or *really true*). Ten scenarios are presented, each examining different dimensions of possible influence (e.g., going along with friends, fitting in with friends, and knowingly doing something wrong). Higher scores indicate less susceptibility to peer influence. Examination of the scale's internal consistency at the baseline interview was conducted, using both Cronbach's alpha and confirmatory factor analysis. Analyses indicated adequate internal consistency (alpha = .73) and adequate fit of the scale to the data: normed fit index (NFI), .92; nonnormed fit index (NNFI), .92; comparative fit index (CFI), .94; and root mean square error of approximation (RMSEA), .04.

Substance use and abuse is assessed by the Substance Use/Abuse Inventory (a modified version of a substance abuse measure used by Chassin, Rogosch, & Barrera, 1991). This 10-item measure assesses the individual's use of alcohol and illegal drug dependency in his lifetime (e.g., "Have you ever wanted a drink or drugs so badly that you could not think about anything else?"). If endorsed, participants are next asked if these problems were the product of alcohol, drugs, or both. Two scores are created: lifetime alcohol dependence and lifetime drug dependence. A count of the number of items endorsed is used as a measure of substance dependency, higher numbers indicating greater alcohol or drug dependence.

Peer group characteristics—The Peer Delinquent Behavior items are a subset of those used by the Rochester Youth Study that assess the degree of antisocial activity among an individual's peers (Thornberry, Lizotte, Krohn, Farnworth, & Jang, 1994). There are two dimensions to this scale: antisocial peer behavior (e.g., "How many of your friends have sold drugs?") and antisocial peer influence (e.g., "How many of your friends have suggested that you should sell drugs?"). The scale contains 19 items to which participants respond on a 5-point Likert-type scale ranging from *none of them* to *all of them*. The peer antisocial behavior subscale (12 items; alpha = .92; NFI = .93; NNFI = .92; CFI = .94; RMSEA = .09) and peer antisocial influence subscale (7 items; alpha = .89; NFI = .95; NNFI = .93; CFI = .96; RMSEA = .07) showed good reliability and validity.

Family characteristics—The Parental Monitoring inventory (Steinberg, Dornbusch, & Darling, 1992) was adapted for this study to examine parenting practices related to supervision of the adolescent. Preliminary questions establish the presence of a single individual (X) who was primarily responsible for the youth; questions are asked pertaining to this individual. The scale is composed of nine items. Five items assess parental knowledge (e.g., “How much does X know about how you spend your free time?”) and are answered on a 4-point Likert-type scale ranging from *doesn't know at all* to *knows everything* (these questions are asked whether or not a youth lives with the person identified as his primary caretaker). Parental monitoring is assessed by four additional items (e.g., “How often do you have a set time to be home on weekend nights?”). These are answered on a 4-point Likert-type scale that ranges from *never* to *always* (these questions are only asked of youth residing with a caregiver). Higher scores indicate greater parental knowledge and monitoring. A two-factor confirmatory factor analysis (CFA) model was fit to the data to assess both parental monitoring and parental knowledge. Results found good fit for the model (NFI = .94; NNFI = .92; CFI = .95; RMSEA = .08).

ANALYSIS

To examine the concordance of variety and frequency, this study used semi-parametric group-based modeling (SPGM), which provides a number of advantages over other modeling strategies. First, SPGM identifies groups that follow similar patterns over time and maps well onto life-course theories of antisocial behavior, which posit that youth show different ages of onset and offset of offending. Second, mixture modeling capitalizes on individual variance and thus allows for an examination of how groups of individuals differ; other analytic techniques, such as growth curve modeling, identify average patterns, making it more difficult to detect effects at the high and low ends of the spectrum. Finally, many developmental theories of criminal behavior specifically posit that different factors contribute to offending, based on the overall pattern of offending (e.g., peer group mechanisms are hypothesized to be particularly important for adolescent-onset offending) and mixture modeling specifically allows for the effect of covariates to vary across groups (e.g., peers can predict offending in one group, but not in another). Thus, mixture modeling allows for a theoretically relevant and practical test of the concordance between variety and frequency, as well as prediction of concordance rates across the two domains.

SPGM was used to identify subgroups of individuals who followed similar patterns of behavior over time and to estimate the probability of joint trajectory membership (Nagin, 2005; Nagin & Land, 1993; Piquero, 2008). Because analyses were based on count data, zero-inflated Poisson modeling was used to account for the clustering at zero (Lambert, 1992). Specifically, because we were interested in identifying joint trajectories of variety and frequency, we used a joint estimation procedure that estimates each group's trajectories in combination (Brame, Mulvey, & Piquero, 2001). In addition to the two trajectories (variety and frequency), an estimate of the proportion of the population that follows each pair of trajectories is produced. Furthermore, we also estimated the probability that each individual belongs to each of the groups. This probability was calculated on the basis of data and the maximum likelihood parameter estimates associated with the mixture (posterior probability of group membership) and was used to assign individuals membership to the most likely group.

Analyses tested for up to seven latent trajectory classes for both variety and frequency, and the Bayesian Information Criterion (BIC) was used to compare the fit of different models (Jones, Nagin, & Roeder, 2001). Because group-based trajectory modeling is a data-driven technique, it was important to identify a priori factors to help determine model selection. Three criteria were used to determine the best latent class solution: the lowest BIC value relative to other models tested, a conceptually clear model, and adequate group membership per trajectory (at

least 5% of the sample). The number of classes was decided on and then the form of the polynomial used to capture the shape of each trajectory was selected, with the highest significant polynomial trend included in analyses. First, we identified the best group-trajectory solution for variety of offending; second, we identified the best group-trajectory model for frequency of offending. Finally, we estimated both variety and frequency trajectories simultaneously and examined whether covariates differentially predicted dual trajectory membership.

After identifying joint trajectories of variety and frequency, subsequent binary and multinomial logistic regression analyses examined how prior criminal activity, individual characteristics, peer characteristics, and parenting characteristics related to membership in joint trajectory groups. First, we compared individuals with low rates of offending with those with high rates of offending. Second, we tested if the covariates predicted differences among youth who followed similar variety offending trajectories (e.g., moderate variety) but different frequency trajectories (e.g., moderate frequency vs. early-peak frequency). Thus, characteristics of a youth (criminal history and individual characteristics) and his social groups (parents and peers) at baseline were used to predict disparity in joint trajectory concordance.

RESULTS

CORRELATIONS BETWEEN OFFENDING FREQUENCY AND OFFENDING VARIETY

We begin by presenting age-based bivariate correlations between offending frequency and offending variety (see Table 1). Two specific results from these correlations are noteworthy. First, as expected, the correlations between variety and frequency within age are strong, but not perfect, and along the diagonal range from .62 to .73. Second, also as expected, as one moves away in age from the diagonal, the correlations become weaker. For example, the correlation between frequency and variety at the same age, say 15, are always stronger than the correlations between one of these criminal career dimensions at age 15 and the other at age 18. Of course, these bivariate correlations do not tell us about how the two dimensions are interrelated (whether individuals scoring high on one dimension are also scoring high on the other dimension), an issue that is addressed in further analyses.

SINGLE TRAJECTORY ANALYSES

Variety of offending—Although the BIC values indicated that a six-group solution provided the best fit to variety scores, a five-group solution was selected because the six-group solution did not add substantially to the understanding of different group patterns (see Table 2). The additional subgroup identified in the six-group solution did not indicate a trajectory that was distinct in shape or in level of offending variety compared with those appearing in a five-group solution. Furthermore, in the six-group solution, one group consisted of less than 5% of the sample. Thus, the five-group solution was the best in terms of fit, conceptual meaning, and group distribution.

Figure 1 shows the final five-group variety trajectory solution with 95% confidence intervals around each trajectory. Group 1 (the low trajectory) consisted of 37.3% of the sample and included individuals who committed few different offense types over 5 years. Group 2 (the moderate trajectory) consisted of individuals who engaged in a moderate offending variety across time (18.7% of the sample). Group 3, 14.6% of the sample, consisted of individuals whose offending variety increased throughout adolescence, peaked around 17, and declined thereafter (i.e., adolescence-peak trajectory). Group 4 (the desisting trajectory) consisted of individuals who were involved in a large variety of offenses at younger ages and rapidly decreased the variety of offenses as they aged (23.7%). Finally, Group 5 (the persisting group)

consisted of youth who consistently engaged in a high variety of offenses over time (5.7% of the sample).

Frequency of offending—Next, we identified trajectories of offending frequency over time (see Table 2 for model selection; see Figure 2 for trajectories with a 95% confidence interval around each trajectory). Although mixtures of up to seven latent classes were considered, a six-group solution was selected because (a) the BIC indicated that this model best fit the data, (b) it identified a distinct trajectory from the five-group solution, and (c) each group contained an adequate proportion of the sample. Figure 2 shows the final six-group solution. Group 1, the low group, consisted of 54.5% of the sample; these youth engaged in a low frequency of offending across all ages. Group 2 (decreasing group; 12.4% of the sample) engaged in moderately frequent offending at younger ages, declining as they transitioned into late adolescence and adulthood. Group 3 was made up of 7% of the sample. These individuals engaged in a low offending frequency when younger, gradually increasing throughout adolescence and early adulthood (increasing group). Group 4 consisted of 7.1% of the sample, with individuals evincing a moderate offense frequency across all ages (moderate trajectory). Group 5 increased rapidly in offending frequency throughout adolescence, peaking around age 18 and declining rapidly thereafter (early-peak; 10.3% of the sample). Finally, Group 6 (late-peak group) consisted of individuals whose offending frequency peaked in late adolescence (8.6% of the sample), declining thereafter.

JOINT TRAJECTORY ANALYSES

Thus far, we have presented single trajectory analyses based on variety and frequency. In this section, we investigate this concordance using joint or dual trajectory analysis, a technique that affords one approach to studying this question. Using the solutions derived from single trajectory analyses (the five-group variety trajectories and the six-group frequency trajectories), both trajectories were estimated simultaneously to examine how trajectories of offending variety are linked with trajectories of offending frequency (see Table 3 for group distribution).

Results provide the probability of group membership in each trajectory of one solution (either variety or frequency trajectories) based on membership assigned in the other. We first examined the probability of membership in each of the frequency trajectories given membership in each of the variety trajectories (see Table 4 and Figure 3 and Figure 4). Individuals in the low variety trajectory had the greatest probability of belonging to the low frequency group. Youth in the moderate variety group were most likely to belong to the increasing frequency trajectory, followed by the late-peak, decreasing, and low frequency groups. Individuals in the adolescence-peak variety trajectory group were most likely to belong to the late-peak frequency trajectory, followed by the moderate and early-peak frequency trajectory groups. Individuals in the desisting variety trajectory were most likely to belong to the decreasing frequency trajectory; these youth were second most likely to belong to the moderate frequency trajectory. Finally, individuals in the persisting variety group were most likely to belong to the moderate frequency trajectory.

We also examined the probability of variety score group membership conditional on frequency trajectory group membership (see Table 5). Results indicate that youth in the low frequency trajectory are most likely to fall in the low variety trajectory. Individuals on a decreasing frequency trajectory are most likely to belong to the desisting variety trajectory. Individuals who belonged to the increasing frequency trajectory were most likely to belong to the moderate variety trajectory. In the moderate frequency trajectory, individuals were most likely to belong to the desisting variety trajectory, followed by the persisting variety trajectory and the moderate variety trajectories. Individuals in the early-peak frequency trajectory had the greatest

probability of simultaneously belonging to the adolescence-peak variety trajectory. Finally, youth in the late-peak variety trajectory were most likely to fall into the desisting and the moderate variety trajectories.

It is notable that these patterns reflect the combination of frequency and variety and closely reflect the data distribution at a single time point. At any given age, there are a number of youth reporting high variety and high frequency, as well as youth reporting high levels in one dimension of offending but not the other. For example, a youth might report one variety offense, drug dealing, but a high frequency, over 1,000 in a recall period. Similarly, youths might report a large variety of offenses (e.g., beating a person up, a gang fight, hurting somebody so badly he or she needed a doctor, taking something by force using a weapon), yet each of these offenses may reflect a single event.

SUMMARY OF JOINT TRAJECTORY CONCORDANCE

The joint trajectory analysis suggests that at the tails of the continuum (low and high groups), there is a rather strong concordance between frequency and variety. Individuals in the low-rate variety trajectory group were highly likely to also be members of the low-rate frequency trajectory group. Although not as highly likely, a similar, strong concordance emerged with respect to the high-rate variety trajectory group and the high-rate frequency trajectory group. In short, among the low- and high-rate offenders, there appears to be a good concordance between variety and frequency, whereas for individuals whose offending is moderate, there is much more variation between variety and frequency. Importantly, statistical techniques that average the concordance across all individuals (e.g., bivariate correlations reported previously) obscure that the concordance among variety and frequency is a product of how much an individual offends.

PREDICTING JOINT TRAJECTORY GROUP MEMBERSHIP

Finally, we examined whether criminal history (number of prior petitions and age at first petition), individual characteristics (resistance to peer influence, alcohol abuse, and drug abuse), peer characteristics (antisocial peer behavior and antisocial peer influence), and parenting (parental knowledge and parental monitoring) distinguished among joint trajectory concordance. Logistic regression (binary and multinomial) was used to compare individuals' different joint trajectories. Youth were only examined if an adequate number of individuals were assigned joint trajectory membership ($n > 20$). In all analyses, the most severe offenders, those with the most chronic offending frequency trajectory, were used as the reference group.

First, we compared individuals in the low/low joint trajectories (the lowest joint trajectory offenders) with youth in the persisting/moderate joint trajectory (the most chronic joint offending trajectories). Because both joint trajectories had high concordance rates, these binary logistic regressions identified differences between the most and least chronic offenders. Second, binary logistic regressions were used to examine how criminal history and individual, peer, and parenting characteristics related to differences between individuals who followed the desisting/early-peak trajectory and youth who followed the desisting/declining joint trajectory. Third, multinomial logistic regression was used to compare individuals who followed the moderate/early-peak and moderate/late-peak joint trajectories with youth who were assigned membership in the moderate/increasing joint trajectory. Finally, using the previously mentioned covariates, multinomial logistic regression was used to predict membership in the adolescence-peak/early-peak trajectory and adolescence-peak/late-peak joint trajectory groups compared with youth who followed the adolescence-peak/moderate joint trajectory. Again, in each analysis, the most serious offending trajectory, the moderate/increasing joint trajectory and the adolescence-peak/moderate joint trajectory, respectively, was used as the reference group.

Compared with youth in the persisting/moderate trajectories, individuals in the low/low joint trajectory associated less with antisocial peers both in terms of antisocial behavior and antisocial influence at the baseline interview (see Table 6). There was also a trend toward the parents of youth in the low/low joint trajectory group having greater knowledge of their child's activities than parents of youth in the persisting/moderate joint trajectory. Criminal history, individual resistance to peer pressure, substance abuse, and parental monitoring did not distinguish between individuals in the persisting/moderate and low/low joint trajectory groups.

Next, we used binary logistic regression to examine differences between youth who followed the desisting/early-peak joint trajectory and youth who followed the desisting/declining joint trajectory (see Table 6). Individuals with greater resistance to peer influence tended to follow the desisting/early-peak joint trajectory compared with desisting/declining youth. Although individuals in the desisting/early-peak trajectory were less likely to abuse alcohol, they were more likely to abuse drugs. No other covariates predicted disparity in membership in the two joint trajectories.

The next set of analyses used multinomial logistic regression to examine differences between youth who were assigned to the moderate/decreasing and moderate/late-peak joint trajectories and youth assigned to the moderate/increasing joint trajectory (see Table 7). Foremost, older youth at first petition and those with less parental monitoring were most likely to belong to the moderate/decreasing joint trajectory. No other variables predicted differences in membership between the two groups. Second, having fewer prior petitions predicted membership in the moderate/late-peak joint trajectory compared with the moderate/increasing offending trajectory. Moreover, these youth were younger at the first petition to court, had peers with less antisocial influence, and reported greater parental monitoring than youth in the moderate/increasing joint trajectory. No other covariates predicted membership in the two groups.

Finally, multinomial logistic regression was used to assess if criminal history, resistance to peer influence, substance abuse history, antisocial peer behavior and influence, and parental knowledge and monitoring predicted different concordance rates between adolescence-peak variety scores and early-peak, late-peak, and moderate frequency trajectory groups (see Table 8). Individuals with lower resistance to peer influence and youth who report high parental monitoring were more likely to belong to the adolescence-peak/moderate joint trajectory. There was also a trend toward individuals with less drug dependency predicting membership in the adolescence-peak/early-peak trajectory compared with the adolescence-peak/moderate joint trajectory. No other covariates predicted differences in joint trajectory membership. Finally, younger youth at first petition without a history of drug dependence were more likely to belong to the adolescence/late-peak joint trajectory compared with the adolescence-peak/moderate joint trajectory group. No other covariates predicted differences between the two groups.

SUMMARY OF PREDICTING JOINT TRAJECTORY MEMBERSHIP

Results of the logistic regressions indicate that criminal history, individual characteristics, peer characteristics, and family characteristics predict joint trajectory membership, although the pattern of findings varies based on the joint trajectories being compared. Specifically, youth in the low/low trajectory are primarily distinguished from individuals in the persisting/moderate trajectory by interpersonal factors, having fewer antisocial peers and greater parental monitoring. Among individuals in the desisting variety trajectory, membership in the declining or early-peak frequency trajectory is best predicted by individual characteristics, specifically resistance to peer influence and substance dependency. It is interesting that, among youth who follow the moderate variety trajectory, individuals who are significantly older at first petition are more likely to peak in offending early in adolescence and decline thereafter than they are to engage in consistent and moderate levels of offense frequency across time. Perhaps it is the case that with time, individuals transition from a great variety of offenses into a more select

repertoire of offenses (Piquero, Paternoster, Mazerolle, Brame, & Dean, 1999), including those for which they may accumulate the sort of knowledge to commit with relative impunity (Spelman, 1994). Furthermore, individuals in the moderate/late-peak trajectory are distinguished by both prior criminal (fewer prior petitions and being younger at first petition) and social characteristics (fewer peers with antisocial influence and less parental monitoring). Finally, among youth assigned to the adolescence-peak variety trajectory, those with lower resistance to peer influence and greater parental monitoring peak in offense frequency in early adolescence and decline thereafter—a finding consistent with Moffitt's prediction with respect to the role of peers in adolescent offending. Those youth who follow the late-peak frequency trajectory tend to be younger at first petition and less dependent on drugs than those in the adolescence-peak variety trajectory who offend at a consistent frequency across time (moderate frequency trajectory).

DISCUSSION

Although concordance between offending variety and offending frequency is a keystone of life-course theory, extant research had not yet examined their joint covariation within individuals generally, and among serious youthful offenders in particular, a specific policy-relevant group for which little is known concerning persistence/desistance with regard to criminal activity and its correlates (Laub & Sampson, 2001). This study addressed these issues, and several notable findings emerged.

First, bivariate correlations indicated a strong but not perfect within-age relationship between frequency and variety. Correlations were strongest concurrently (e.g., variety and frequency at age 15) but became weaker as age ranges were not concurrent (e.g., variety at 15 and frequency at 20). Second, single trajectory analyses indicated a five-group solution for variety and a six-group solution for frequency. Variety trajectories indicated evidence of a persisting group, a moderate group, and other lower variety groups, whereas frequency trajectories indicated an early- and late-peak group, as well as an increasing group. Third, joint trajectory analyses provided evidence for a strong relationship of frequency and variety at the tails, that is, among the low- and high-rate groups. For example, individuals in the low variety trajectory had the greatest probability of belonging to the low frequency group, whereas youth in the moderate variety group were most likely to belong to the increasing frequency trajectory. Similarly, individuals in the desisting variety trajectory were most likely to belong to the decreasing frequency trajectory, whereas individuals in the persisting variety group were most likely to belong to the moderate frequency trajectory.

Finally, when the predictors of joint trajectory group membership were examined, we found that (a) compared with individuals in the persisting/moderate trajectories, those in the low/low joint trajectory associated less with antisocial peers and their parents had a greater knowledge of their own activities; (b) compared with youth in the moderate/increasing trajectories, those in the moderate/decreasing joint trajectory were significantly older at the first petition and had lower parental monitoring; and (c) compared with individuals in the adolescence-peak/moderate joint trajectory, those in the adolescence-peak/early-peak joint trajectory had lower resistance to peer influence and reported that parents had greater knowledge of their activities. There was some evidence, then, that certain risk factors distinguished between joint trajectories of frequency and variety and that the between-trajectory differences are consistent with expectations concerning the relationship between higher risk and worse offending—regardless of whether offending is measured via frequency or variety.

We should note that the peer measures were among the strongest discriminators between trajectory groups. Consistent with research indicating that affiliation with deviant peers strongly relates to criminal activity (Elliott & Menard, 1996; Lipsey & Derzon, 1998), youth

in the persisting/moderate joint offending trajectory reported greater antisocial peer behavior and antisocial peer influence compared with youth in the low/low dual trajectory. Although peer characteristics distinguished among these youth, in general, peer deviance does not differentiate among youth following other dual trajectories (with the exception of youth following the moderate/late-peak joint trajectory). In contrast, youth in the desisting, adolescence-peak, and moderate variety trajectories are distinguished in their offending frequency by age of onset, drug history, and parental monitoring and knowledge. Individuals who are younger at first petition are more likely to follow a late-peak frequency trajectory, whereas those who are older at first petition tend to follow the decreasing frequency trajectory. Given that youth typically desist from antisocial behavior as they transition into adulthood, it is not surprising that individuals who start offending later would desist quicker, in particular given that the transition to adulthood is marked by ecological changes known to affect propensity to engage in offending (such as employment and marriage; Laub & Sampson, 2003). Indeed, given that parental monitoring is also associated with decreasing offense frequency, frequency may be determined by a combination of social and psychological factors that limit opportunity and reasons to engage in frequent offending.

In contrast to mechanisms that may serve to prevent youth involvement in antisocial behavior (e.g., parental control), substance use and abuse may be linked to substantively different patterns of involvement in antisocial behavior. To the extent that aggression at younger ages is linked to increased substance use, and in turn greater antisocial behavior (O'Donnell, Hawkins, & Abbot, 1995), it is not surprising that within variety trajectories, youth reporting greater substance dependency tend to follow more chronic offending frequency trajectories. Thus, although peer characteristics may determine involvement in offending at the high and low ends of the spectrum, among more modestly offending youth, peers may be less important than psychological and parenting variables, which may be more influential in determining concordance between variety and frequency. In sum, the findings emerging from this study are largely consistent with expectations concerning the strong relationship between the criminal career dimensions of frequency and variety derived from both Gottfredson and Hirschi's general theory of crime and Moffitt's developmental taxonomy, in particular with respect to crime patterning of the more high-rate or life-course-persistent-type offenders. We found consistent evidence at the low and high ends of the trajectory continuum that frequency and variety were largely interrelated such that those individuals who engaged in a great variety of offenses were also engaging in a great number of offenses. We believe that the joint trajectory analyses provide a unique lens within which to examine the within-individual linkage concerning these two criminal career dimensions.

At the same time, although our effort provided one of the first investigations of the joint, longitudinal patterning of frequency and variety, several limitations should be acknowledged and subsequently addressed in pursuant studies. First, due to sample size concerns, our analysis focused solely on males. The extent to which frequency and variety coalesce in a similar manner among females remains an open question. Second, although the use of a serious offending sample provides some power with respect to frequency and variety, and data on criminal career dimensions among such samples are rare (Laub & Sampson, 2001), it is unclear how much our findings are due to this unique sample. Third, the sample was also somewhat selective, representing individuals who came into contact with the juvenile/criminal justice systems in two jurisdictions. Just how this selection process influenced our findings is unknown. Fourth, although our sample lies within the age range within which much offending occurs, peaks, and begins to diminish, whether the same set of identified trajectories and relation of risk factors to these trajectories emerges earlier or later awaits further empirical scrutiny. Finally, although the within-individual patterning of frequency and variety was not perfect, as there was evidence that some moderate-variety offenders engaged in a low/decreasing number of offenses,

investigating these discrepancies (i.e., those individuals who are low on one dimension and high on another) is an important issue for further research.

It is important to bear in mind that although variety and frequency are highly concordant, concordance rates between variety and frequency are stronger for high- and low-level offenders than they are for moderate offenders, perhaps because during adolescence, moderate levels of offending tend to be associated with more attenuated offending frequency; thus, moderate offending youth belong to an assortment of moderate frequency trajectories but not the highest or lowest trajectories. It is important to note that this finding would have been obscured in more traditional analyses (such as growth curve modeling or regression) where effects are averaged across all individuals, and it speaks to the importance of using statistical methods that capitalize on individual patterns of development. Furthermore, results suggest that criminal characteristics, individual characteristics, and parent and peer characteristics influence a youth's likelihood of following one frequency trajectory versus another. In general, youth who offend at high levels are primarily affected by deviant peers and lower parental monitoring, whereas modest offending youth are delineated by criminal characteristics and substance abuse or dependency. A better understanding and articulation of the theoretical processes accounting for these associations is important as they bear relevance to current DLC theories of crime. Some of these theories do not anticipate these specific findings, and some consideration should be given to how they fit within existing frameworks. Such knowledge may provide information that can be useful in developing prevention and intervention efforts that are successful in thwarting continued trajectories of frequent and varied criminal activity among serious youthful offenders as they transition into adulthood.

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Figure 1. Trajectories of Variety of Offending

Figure 2. Trajectories of Frequency of Offending

Figure 3. Dual Trajectories of Offending

Note. L/L = Low/Low; M/I = Moderate/Increasing; M/LP = Moderate/Late-Peak; M/D = Moderate/Decreasing; AP/LP = Adolescence-Peak/Late-Peak; AP/M = Adolescence-Peak/Moderate; AP/EP = Adolescence-Peak/Early-Peak; D/D = Desisting/Declining; D/EP = Declining/Early-Peak; P/M = Persisting/Moderate.

Figure 4. Dual Trajectories of Offending by Variety Trajectory Group

Note. L/L = Low/Low; M/I = Moderate/Increasing; M/LP = Moderate/Late-peak; M/D = Moderate/Decreasing; AP/LP = Adolescence-Peak/Late-Peak; AP/M = Adolescence-Peak/Moderate; AP/EP = Adolescence-Peak/Early-Peak; D/D = Desisting/Declining; D/EP = Declining/Early-Peak; P/M = Persisting/Moderate.

TABLE 1

Bivariate Correlations of Variety and Frequency of Offending by Age

Variety Offending by Age	Frequency of Offending by Age										
	14	15	16	17	18	19	20	21	22		
14	.69**	.50**	.36**	.40**	.19*	—	—	—	—		
15	.39**	.71**	.23**	.27**	.17**	.01	—	—	—		
16	.46**	.38**	.62**	.22**	.29**	.15**	.17**	—	—		
17	.22**	.40**	.30**	.67**	.29**	.25**	.20**	.11	—		
18	.33**	.28**	.32**	.30**	.69**	.34**	.24**	.15**	.28*		
19	—	.09	.19**	.28**	.34**	.72**	.39**	.41**	.23*		
20	—	—	.20**	.31**	.30**	.43**	.65**	.38**	.28**		
21	—	—	—	.22**	.21**	.37**	.27**	.73**	.30**		
22	—	—	—	—	.16	.22	.20	.24*	.60**		

*
 $p < .05$.**
 $p < .01$.

TABLE 2Bayesian Information Criterion (BIC) and $2 \log_e(B_{10})^a$ of the Models Considered

Number of Groups	BIC	Null Model	$2 \log_e(B_{10})$
Variety of offending trajectories			
1	-5124.44	—	—
2	-5145.47	1	-42.06
3	-6238.54	2	-2186.14
4	-4794.47	3	-2888.14
5	-4766.23	4	-56.48
6	-4759.78	5	-12.90
7	-4765.34	6	-11.12
Frequency of offending trajectories			
1	-15126.67	—	—
2	-8141.06	1	-6985.61
3	-6238.54	2	-1902.52
4	-5737.54	3	-501.00
5	-5126.18	4	-611.36
6	-4926.32	5	-199.86
7	-5014.57	6	88.25

TABLE 3

Number of Participants per Group

Variety of Offending Groups	Frequency of Offending Groups					
	Group 1 Low	Group 2 Decreasing	Group 3 Increasing	Group 4 Moderate	Group 5 Early-Peak	Group 6 Late-Peak
Group 1 Low	464	1	0	0	2	0
Group 2 Moderate	16	26	77	9	0	37
Group 3 Adolescent-peak	1	7	0	35	26	46
Group 4 Desisting	13	182	0	3	129	3
Group 5 Persisting	0	0	3	25	0	0

TABLE 4
Frequency of Offending Group Membership Probabilities Conditional on Variety of Offending Membership

Variety of Offending Groups	Frequency of Offending Groups					Group 6 Late-Peak
	Group 1 Low	Group 2 Decreasing	Group 3 Increasing	Group 4 Moderate	Group 5 Early-Peak	
Group 1 Low	99.08	0.16	0.00	0.00	0.75	0.00
Group 2 Moderate	9.68	16.74	47.48	5.79	0.35	19.95
Group 3 Adolescent-peak	0.00	10.38	0.00	24.61	24.01	41.00
Group 4 Desisting	4.20	55.26	0.00	1.09	38.83	0.61
Group 5 Persisting	0.00	0.00	10.79	89.21	0.00	0.00

TABLE 5
 Variety of Offending Group Membership Probabilities Conditional on Frequency of Offending Membership

Frequency of Offending Groups	Variety of Offending Groups				
	Group 1 Low	Group 2 Moderate	Group 3 Adolescence-Peak	Group 4 Desisting	Group 5 Persisting
Group 1 Low	93.70	3.50	0.00	2.70	0.00
Group 2 Decreasing	0.30	13.60	6.00	80.20	0.00
Group 3 Increasing	0.00	96.10	0.00	0.00	3.90
Group 4 Moderate	0.00	14.00	42.20	4.80	39.00
Group 4 Early-peak	2.20	0.40	19.10	78.30	0.00
Group 5 Late-peak	0.00	39.80	58.00	2.20	0.00

TABLE 6

Binary Logistic Regression Comparing Joint Trajectories

Variable	Dual Trajectory Groups			
	Low/Low ^a		Desisting/Early-Peak ^b	
	B (SE)	Exp(B)	B (SE)	Exp(B)
Intercept	14.25 (4.43)	0.01	-2.53 (2.11)	0.08
Number of prior arrests	0.05 (0.12)	0.95	-0.03 (0.08)	0.97
Age at first arrest	-0.26 (0.22)	1.29	-0.08 (0.10)	0.93
Resistance to peer influence	-0.40 (0.57)	1.48	0.74 (0.26)**	2.10
Alcohol dependency	-0.16 (0.20)	1.18	-0.16 (0.08)**	0.85
Drug dependency	-0.17 (0.11)	1.19	0.21 (0.06)**	1.24
Antisocial peer behavior	-2.08 (0.46)**	7.96	0.16 (0.20)	1.17
Antisocial peer influence	-0.75 (0.31)**	2.12	0.14 (0.19)	1.15
Parental knowledge	0.72 (0.42) [†]	0.49	0.01 (0.19)	1.01
Parental monitoring	-0.28 (0.41)	1.32	0.05 (0.17)	1.05
				0.09

^aReference group is Persisting/Moderate joint trajectory.^bReference group is Desisting/Decreasing joint trajectory.[†] $p < .10$.** $p < .01$.

TABLE 7

Multinomial Logistic Regression Predicting Membership in Frequency Trajectories and Moderate Variety Group Membership

Variable	Dual Trajectory Groups			Moderate/Late-Peak ^a		
	Moderate/Decreasing ^a					
	B (SE)	Exp(B)	Wald	B (SE)	Exp(B)	Wald
Intercept	-6.11 (5.10)	—	1.45	9.96 (3.96) *	—	6.32
Number of prior arrests	0.13 (0.19)	1.14	0.47	-0.30 (0.16) †	0.74	3.40
Age at first arrest	0.55 (0.27) *	1.73	4.08	-0.56 (0.20) *	0.57	7.73
Resistance to peer influence	-0.20 (0.52)	0.82	0.15	0.50 (0.45)	1.64	1.22
Drug dependency	0.01 (0.14)	1.00	0.01	0.13 (0.12)	1.14	1.25
Alcohol dependency	-0.04 (0.22)	0.96	0.04	0.19 (0.22)	1.21	0.79
Antisocial peer behavior	0.34 (0.50)	1.41	0.47	0.65 (0.43)	1.92	2.29
Antisocial peer influence	-0.33 (0.60)	0.72	0.30	-1.29 (0.57) *	0.28	5.20
Parental knowledge	-0.50 (0.38)	0.60	1.79	-0.38 (0.35)	0.69	1.14
Parental monitoring	-0.78 (0.36) *	0.46	4.63	-0.65 (0.32) *	0.52	4.10

Note. Dashes indicate term was not estimated.

^aReference group is Moderate/Increasing joint trajectory.

† $p < .10$.

* $p < .05$.

TABLE 8

Multinomial Logistic Regression Predicting Membership in Frequency Trajectories and Adolescence-Peak Variety Group Membership

Dual Trajectory Groups						
Adolescence-Peak/Early-Peak ^a				Adolescence-Peak/Late-Peak ^a		
Variable	B (SE)	Exp(B)	Wald	B (SE)	Exp(B)	Wald
Intercept	-1.17 (5.84)	—	0.04	8.17 (4.58) [†]	—	3.18
Number of prior arrests	.01 (0.17)	1.002	0.01	-0.04 (0.15)	0.96	0.08
Age at first arrest	0.25 (0.28)	1.287	0.83	-0.41 (0.22) [†]	0.67	3.62
Resistance to peer influence	-1.48 (0.69) [*]	0.228	4.55	-0.36 (0.60)	0.70	0.37
Alcohol dependency	0.25 (0.23)	1.288	1.20	0.06 (0.21)	1.06	0.08
Drug dependency	-0.26 (0.15) [†]	0.770	2.98	-0.27 (0.13) [*]	0.77	3.99
Antisocial peer behavior	0.51 (0.74)	1.672	0.48	-0.59 (0.59)	0.55	1.00
Antisocial peer influence	-0.13 (0.58)	0.876	0.05	0.57 (0.49)	1.76	1.33
Parental knowledge	1.21 (0.56) [*]	3.358	4.77	0.26 (0.49)	1.30	0.29
Parental monitoring	-0.86 (0.47) [†]	0.422	3.37	0.06 (0.38)	1.06	0.02

Note. Dashes indicate term was not estimated.

^aReference group is Adolescence-Peak/Moderate joint trajectory.

[†] $p < .10$.

^{*} $p < .05$.