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Developmental Trajectories of Boys' and Girls' Delinquency: Sex Differences and Links to Later Adolescent Outcomes

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Abstract

This study examined gender differences in trajectories of delinquent behaviors over a 6-year period in adolescence and differential outcomes of these diverse developmental pathways. Participants were 754 children who were part of a longitudinal study of the development of early starting conduct problems. Four trajectory patterns were identified across grades 7–12: increasing, desisting, chronic, and nonproblem groups. Although the proportion of boys and girls varied across the pathways, both genders were represented on these trajectories. Boys were more represented on the chronic and desisting trajectories; girls were more represented in the nonproblem group. However, the proportion of boys and girls was similar in the increasing trajectory. Trajectory membership significantly predicted age 19 outcomes for partner violence, risky sexual behavior and depression, and the risk conferred on these negative adjustment outcomes did not vary by gender. The overall pattern was characterized by poor outcomes at age 19 for youth in both the chronic and the increasing trajectories. The major conclusion is that, other than base rate differences, developmental patterns and outcomes for girls mimic those previously found for boys.

Keywords

Delinquency; Antisocial behavior; Sex differences; Trajectories

In recent years, there has been increased interest by researchers and policy makers in girls' aggressive and delinquent behaviors (American Bar Association 2001; Office of Juvenile Justice and Delinquency Prevention 2008; Pepler et al. 2005; Putallaz and Bierman 2004). Data from the juvenile justice system show an alarming increase in juvenile arrests for crimes committed by girls. In the last decade, the proportion of juvenile arrests for crimes committed by girls increased by nearly 50%, with an increase from 20 to 29% (Snyder 2008). However, little is known about the development of delinquent behavior among girls,

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as only boys are included in many of the seminal studies that serve as the basis for current theoretical models (e.g., Loeber and Farrington 2001; Patterson et al. 1989).

There is considerable debate on the extent to which male-derived models generalize to girls. Some researchers, primarily those in the juvenile justice arena, argue for sex-specific theories to explain girls' delinquent behavior (Bloom 2003; Chesney-Lind and Pasko 2004; Silverthorn and Frick 1999). By comparison, others contend that current developmental models are sufficient to explain girls' behavior (Fergusson and Horwood 2002; Moffitt et al. 2001). The current study adds to the small but growing literature on girls' delinquency by addressing two important issues. First is to identify trajectories of delinquency across grades 7–12 and ascertain whether girls and boys are represented on similar trajectories. Second is to determine whether the risks conferred for negative adjustment outcomes as a result of delinquency are the same for both genders. We begin by discussing current developmental theories of antisocial behavior and then discuss these models in relation to questions of sex differences in developmental trajectories and outcomes.

Initial developmental frameworks of antisocial behavior were based largely on boys, and outlined two trajectories leading to the peak in offending seen in adolescence (Moffitt 1993; Patterson et al. 1989). The first trajectory was an early starter group of primarily boys with a childhood onset of behavior problems. Briefly, risk processes for this trajectory include harsh, inconsistent parenting and underlying neuropsychological deficits (see Loeber and Farrington 2001 for more detailed information). The antisocial behaviors of these youth begin in childhood, peak in adolescence, and then persist into young adulthood. The second pathway of 'adolescent limited' or 'late starter' youth did not engage in antisocial activity until adolescence, and then desist as they enter adulthood. Risk for this pathway is marked by social factors, namely delinquent peer affiliations. These initial models defined groups a priori based on a pre-defined cutoff for the age of onset of delinquent activity (typically age 14 for the childhood onset youth).

More recent investigations applied innovative latent growth modeling procedures to permit a fine-grained, empirically-driven analysis of trajectory patterns (Nagin and Tremblay 2001). Much of this work focused on boys and identifies trajectories of boys' aggressive and disruptive behaviors. Taken as a whole, studies found remarkably consistent trajectory patterns among boys and showed three to four trajectories of aggressive and disruptive behavior during childhood and into early adolescence (e.g., Broidy et al. 2003; Brame et al. 2001; Chung et al. 2002; Nagin and Tremblay 1999; Schaeffer et al. 2003).

Less consensus exists about whether girls exhibit similar developmental patterns. On the basis of a detailed review of studies with both community and clinical samples, Silverthorn and Frick (1999) proposed a single delayed onset trajectory to account for the fact that very few girls seem to fit the early starter trajectory. In addition, those girls who did initiate antisocial involvement in adolescence seemed to share many of the same risk factors and showed the same negative outcomes in adulthood as did early starter boys. In contrast, other researchers argued that although girls were less chronically delinquent than boys, both genders evidenced similar developmental patterns (Fergusson and Horwood 2002; Moffitt 1993). Specifically, boys were more prone than girls towards neuropsychological deficits, therefore they were overrepresented on early starting trajectories. By comparison, late starting pathways were ruled more by social factors that impact both genders. Thus, the gender ratio was less pronounced for antisocial behavior that has its onset in adolescence.

Unfortunately, there are far fewer studies of trajectory patterns in girls, with even fewer that make comparisons with boys. Three studies focused on trajectories of girls' disruptive behaviors in childhood and early adolescence (Broidy et al. 2003; Cote et al. 2001;

Schaeffer et al. 2006). To our knowledge, only two studies examined girls' trajectories of antisocial behavior during adolescence. Odgers and colleagues (Odgers et al. 2008) reported on trajectories of conduct disorder (CD) symptoms for male and female participants in the Dunedin sample. Four trajectories emerged across ages 7 to 15: low, childhood limited, adolescent limited, and early onset groups, with similar patterns and proportions within each trajectory class for both genders. Fergusson and Horwood (2002) found a more complex pattern, with three separate classes of adolescent onset offending behavior for both genders. However, inconsistent with the Odgers et al. findings (2008), the proportion of boys and girls on the offending pathways did vary by gender, with fewer girls on the highly delinquent pathways. The current study builds on these investigations by examining trajectories based on self-reported ratings of delinquency, a construct that has received less empirical attention. Unlike the Odgers et al. (2008) study that used only eight CD symptoms, our measure includes a large number of items that cover both serious, non-serious, person and property offending. In this way, this study uses a comprehensive measure that is sensitive to behaviors most likely to occur during adolescence and evaluates the extent to which both males and females are represented on trajectories of delinquency.

Also of relevance to understanding sex differences in developmental trajectories is whether these diverse pathways are linked with differential outcomes, and whether outcomes differ for boys and girls. Studies of trajectory outcomes that include both genders are scarce, and existing evidence is mixed. In addition, the few studies that included both genders predominantly examined trajectories in childhood. In the aforementioned multi-site study, Broidy et al. (2003) found that in comparison with boys, girls' trajectories during childhood showed no consistent pattern of linkages with later delinquent outcomes. By comparison, Schaefer et al.'s (2006) study of disruptive behavior trajectories in elementary school indicated similar antisocial outcomes by gender. Studying a broader range of outcomes, Odgers et al. (2008) also found similar adult functioning across female and male antisocial trajectories on mental health, physical health and economic problems.

It remains unclear whether outcomes for trajectories of delinquent youth vary by gender. One hypothesis is that antisocial girls will exhibit a more favorable prognosis than antisocial boys (Giordano and Cernkovich 1997). The rationale for this hypothesis is that boys' conduct problems are relatively more influenced by biological deficits that are less amenable to change. An alternate hypothesis is that those girls who do show conduct problems will have more severe or diverse outcomes because the base rate of these problems is low. Loeber and Keenan (1994) proposed a paradoxical gender effect whereby the risk for co-occurring problems would be greater among the sex that that was less frequently affected.

Another hypothesis is that outcomes are neither worse nor better, but different for each gender. To-date, the majority of trajectory studies examine outcomes related to aggressive and disruptive behavior, such as subsequent arrests. However, developmental theories also explicate how antisocial behavior can lead to a variety of later failures across multiple domains (Capaldi et al. 2004), which is potentially relevant for understanding girls' outcomes. Specifically, there is some evidence to suggest outcomes that may be of particular salience to girls (Pajer 1998). Robins (1986), in a retrospective analysis of adults in the Epidemiological Catchment Area Study, found that a diagnosis of conduct disorder in adolescence led to internalizing disorders among 73% of females, as compared to only 26% of men. Results from the Dunedin sample found that for females only, antisocial behavior was associated with relationship problems and depression (Moffitt et al. 2001).

This work suggests that delinquent girls may be at particular risk for poor outcomes associated with relationship problems and depression. Indeed, frequently discussed in the literature is the relational orientation of girls' delinquency (Chesney-Lind and Pasko 2004;

Office of Juvenile Justice and Delinquency Prevention 1998). Boyfriends are often implicated as gatekeepers in girls' delinquent behavior (Haynie et al. 2005). In addition, girls' offending is often in a mixed-gender context and instigated by males (Warr 1996). Girls' fighting behavior is more likely to take place in private settings and with known individuals, as compared to boys who are more likely to fight with strangers in public. Furthermore, girls with conduct problems may be at particular risk for a number of problem outcomes related to romantic affiliations, including teen parenthood (Miller-Johnson et al. 1999) and high-risk sexual behaviors (Smith et al. 2006).

Closely intertwined with relational issues is depression among girls. Unlike antisocial behavior where boys outnumber girls, females are more likely to meet criteria for lifetime depression than males (Blazer et al. 1994). This imbalance begins in adolescence, where a rapid increase is seen among girls in the base rate of depression (Hankin and Abramson 2001). Depressive problems may be linked to relationships; girls are concerned about the status of their relationships, and experience greater levels of interpersonal stress than boys (Rudolph 2002). They may be preoccupied with negative thoughts and experiences and are prone to a ruminative cognitive style that is associated with depression (Rose 2002). Accordingly, outcomes explored in this study include depression and those related to relationship problems such as partner violence, risky sexual behavior, and reported pregnancies.

Further contributing to the scarcity of work on girls' delinquency is that most studies on trajectories focus on childhood and early adolescence. Few studies examine developmental trajectories during adolescence when girls' delinquency is most likely to occur (see Fergusson and Horwood 2002 and Odgers et al. 2008 for notable exceptions). Although there is a clear need to ascertain trajectory patterns early in development, these studies do not inform on pathways later in adolescence when more youth are likely to engage in antisocial activity. Consequently, we have a more limited understanding of delinquency trajectories and patterns of persistence and desistance across the adolescent years. It is not clear whether there is a single group or subgroups that vary in age of onset and age of desistance. Of particular interest are youth whose antisocial behaviors decrease across adolescence. This subgroup was not theorized in initial formulations (Moffitt 1993; Patterson et al. 1989), although numerous trajectory studies reveal a desister pathway in childhood. The current study adds to the existing literature by covering a 6-year period during adolescence and ascertaining trajectories of delinquent behaviors that are more characteristic of adolescent antisocial activity.

The current study focuses on two major questions. First, we identify trajectories of delinquency across grades 7–12 and determine whether girls and boys are represented on similar trajectories. Second, we ascertain whether the risk conferred on outcomes (risky sex, partner violence, depression, reported pregnancy) by membership on specific delinquency trajectories varies for boys and girls. Based on theoretical models of antisocial behavior, we hypothesize the following trajectory patterns: a group who enter adolescence already engaging in chronically high levels of delinquency; an increasing group whose delinquency begins at low levels and then increases; and a non-delinquent group. We anticipate that girls will be less represented in the chronic delinquency trajectory and more represented in the non-problem group, with an equal gender ratio for the increasing group. Because previous studies suggest some sex-differentiation, we anticipate that the effects on depression and relationship problem domains (partner violence, reported pregnancies, high-risk sexual behavior) will be stronger for girls.

Method

Participants

The participants were part of the Fast Track project, a multi-site longitudinal investigation of the development and prevention of children's conduct problems (Conduct Problems Prevention Research Group [CPPRG] 2002, 2007). The sites included Durham, NC, Nashville, TN, Seattle, WA, and rural central PA. The participants were selected from high-risk schools that were identified based on crime and poverty statistics.

Within each site, the schools were divided into multiple sets matched for demographics (size, percentage free or reduced lunch, ethnic composition), and the sets were randomly assigned to intervention and control conditions. High-risk children were selected based on a two-stage screening process. First, kindergarten teachers rated their students on the 10-item measure of disruptive and aggressive behaviors (Teacher Observation of Classroom Adaptation—Revised; TOCA-R; Werthamer-Larsson and Kellam 1991). Next, parents of those children who scored in the top 40% completed a 24-item scale of children's aggressive and disruptive behaviors (items drawn from Child Behavior Checklist, Achenbach 1991 and the Revised Problem Behavior Checklist, Quay and Peterson 1987). A total score was then derived based on the average of the parent and the teacher ratings.

Children were selected for inclusion into the study based on this screening score, moving from the highest score downward until desired sample sizes were reached within sites, cohorts, and conditions. Deviations were made when a child failed to matriculate into the first grade at a core school (n=59), refused to participate (n=75), or to accommodate a rule that no child would be the only girl in an intervention group. In this manner, three successive cohorts were recruited in 1991, 1992, and 1993 to yield a sample of 891 children, and 445 of these children were randomly assigned to an intervention group and 446 to a control group. Children in the intervention condition received a multi-component prevention program (see CPPRG 2007 for more detailed information).

The participants in this study are drawn from two groups: (1) the high-risk control group (n=446); and (2) a lower risk comparison group that consists of students in the control schools selected to be representative of the school sample at each site (N=308). Note that Fast Track's entire normative sample contains 387 participants. However, 79 of these are also in the high-risk control group. As this study combines data across these two groups, the 79 youth are identified as being in the high-risk control group (due to high screening scores). The total sample consists of 754 participants (66% male; 48% African American, 49% Caucasian, 3% other ethnicity).

Procedures

This study relies on data collected from the youth across a 6-year period when they were in grades 7–12. The child interviews were conducted in the home by trained interviewers (although we did not use parent data in this study, those interviews took place at the same time in separate locations to ensure privacy). The interviewers were blind to condition. For the first assessment, the interviewer read aloud the question and recorded the child's response. Beginning at the ninth assessment (when the child was in the eighth grade), the measures were completed by the youth via a computer-assisted survey interview. The youth were paid to complete the assessments (specific amounts increased as youth were older).

Measures

The measures in this study include assessment of: (a) *delinquent behavior*—assessed over a 6-year period from grade 7 to grade 12; and, (b) *problem outcomes* –intimate partner violence, risky sexual behavior, reported pregnancies, and depression assessed at age 19.

Delinquent Behavior—Antisocial behavior was assessed using the Self-Reported Delinquency (SRD) scale, a commonly used measure of delinquency (Elliott et al. 1989). Youth reported on their involvement in 32 acts that are representative of offenses reported in the Uniform Crime Reports (UCR). They were asked how often in the last year they were involved in each of the delinquent acts.

In the current study, the responses for each item were first summed (with the sum re-adjusted for missing data). The sum score was then re-coded to a 3-point scale: 0 –none, 1 - low (1 to 10), and 2 - high (11 or more). The score was calculated in this way due to the severely non-normal distribution of the raw sum scores. Specifically, students were allowed to key-enter the number of occasions of each delinquent behavior. Thus, it was not uncommon to see item responses ranging from 10 to 50, 99 or occasionally as high as 150, and summing across items lead to even more skewed distributions. With such responses, no straightforward transformation could result in the data approximating a normal or Poisson distribution. We therefore re-coded to a 3-point scale to treat it as an ordinal score. We opted for three levels (as opposed to binary) to capture high frequency delinquency levels.

Problem Outcomes

We assessed problem outcomes when the youth were age 19 in the following domains: partner violence, depressive problems, risky sexual behavior, and the number of reported pregnancies.

Partner violence was assessed with a 30-item scale that was adapted from the *Conflict Tactics Scale* (Straus 1979). The items assessed how the couple handled disagreements and included both positive and negative items (e.g., “I showed my boyfriend/girlfriend I cared for him/her even though we disagreed” and “I slapped my boyfriend/ girlfriend”). Only those respondents who reported having a boy/girlfriend in the last year completed these items (n= 405, which represents 76% of the participants who provided data). The internal consistency of the scale was good (α=0.83).

Depression—Depressive symptoms were assessed using the Brief Symptom Inventory (BSI; Derogatis 1993). The BSI is a 53-item self-report scale that measures nine symptom dimensions, including a six-item depression scale; it was developed from its longer parent instrument, the Symptom Checklist-Revised (SCL-90-R; Derogatis 1977). Questions asked about the presence of symptoms in the past seven days; items were scored on a 5-point scale (0=“not at all” to 4=“extremely”). Using age- and sex-based non-patient norms, the raw scores were converted to T-scores. We conducted this conversion so that the scores could be interpreted relative to values conventionally used in the literature. The internal consistency in this sample was good (α=0.83).

Risky sexual behavior was assessed using the *Romantic Relationships Questionnaire*, which was based on items used in the National Longitudinal Study of Adolescent Health (Bearman et al. 1997). The measure assessed sexual activity and whether participants had any sexually transmitted diseases. One dichotomous item measuring whether the participant ever had sex without using a condom represented risky sexual behavior.

Number of Pregnancies—Both male and female participants also reported on the number of pregnancies. Females were asked whether they had ever been pregnant and males were asked whether they had ever impregnated anyone. The score indicated the number of reported pregnancies, with a ceiling of five occasions.[1]

Attrition

Of the original 754 participants, data were available for the following: (a) grade 7: n=607 (81%); (b) grade 8: n=575 (76%); (c) grade 9: n=571 (76%); (d) grade 10: n=548 (73%); (e) grade 11: n=539 (71%); and (f) grade 12=n= 551 (73%). We determined whether missingness varied as a function of risk group, sex, and ethnicity at each of the six time points, and three of the eighteen tests were significant.[2] Specifically, high-risk youth were significantly more likely to be missing data at grade 11, χ^2 (N=754)=4.43, p< 0.01. In addition, African American youth were more likely to be missing data at grades 10, χ^2 (N=754)=5.89, p<0.05, and grade 11, χ^2 (N=754)=4.38, p<0.05. Missingness did not vary as a function of gender. All other tests of missingness were not statistically significant. The relatively few significant results suggest that the assumption of Missing At Random (MAR) underlying the models is unlikely to be false. Thus, although power is lost due to attrition, substantial bias due to differential attrition is not likely to be a major threat to the validity of the conclusions.

Results

Descriptives

As described previously, delinquency ratings across grades 7 to 12 were coded as “none,” “low,” and “high” at each grade. Table 1 displays the proportion of youth at each of these three levels separately for males and females, including chi square tests of gender differences. As expected, males were more delinquent at all ages (i.e., girls were more represented in the ‘none’ group). The proportion of girls in the low delinquent level increased over time, such that by grade 12, girls made up a higher proportion than boys. By comparison, the high delinquent group remained disproportionately male over grades 7 to 12. Table 2 provides descriptive data and tests of gender differences for the four outcome variables (means, standard deviations and t-tests for the continuous variables; proportions and chi square tests for the categorical variables). Mean levels of partner violence, and rates of pregnancy and risky sex were higher for girls. Based on T-scores normed for gender, depression levels did not vary.

Identification of Delinquency Trajectory Classes

The focal modeling strategy was a general growth mixture model (GGMM; Muthén 2004) to identify patterns in delinquent behavior over time. Ordinal indicators of delinquency (none, low, high) across grades 7 to 12 were used as indicators in logistic growth mixture models. All models were estimated in *Mplus* v.5.0 (Muthén and Muthén 2007), utilizing that software’s facilities for estimation of mixture models with incomplete ordinal data. We analyzed data for both genders combined, as well as examining gender as a predictor of trajectory classes.

We fitted two-, three-, four-, and five-class models, in which each class represented a subsample with a distinct longitudinal trend in delinquency. That is, the intercept, linear

[1]Reliance on single item measures for reports of risky sexual behavior and pregnancy was dictated by the data available in the study. Although the use of single items can yield criterion and predictive validity (e.g., Miller-Johnson et al. 2004; Zimmerman et al. 2006). multiple item scales would yield a more in-depth analysis of key constructs.

[2]The participants who were neither African American nor European American were excluded from the attrition analyses for ethnicity.

slope, and quadratic slope of the growth in the logit of delinquency were allowed to vary by class. Variances of the growth parameters were constrained to be equal across classes in order to facilitate estimation in this moderately-sized sample. Class membership was regressed on youth gender in a multinomial logistic model as part of the analysis.

In order to determine the model that fits best to the data, we relied on the Bayesian Information Criterion (BIC; Schwarz 1978) and the bootstrapped likelihood ratio test (bLRT; Nylund et al. 2007). The BIC declined in value from two (BIC=6471), to three (BIC=6335), to four (BIC= 6306) classes. The value then rose slightly for 5 classes (BIC=6317), therefore favoring the four-class model. As a further check, we then used the bLRT (Nylund et al. 2007) to test the need for the fifth class. The bLRT, when applied to a model with *k* classes, tests the need for the *k*th class—a significant bLRT indicated that the *k*th class results in a significant improvement to the model. The bLRT was not significant for the 5-class solution (p=1.00), indicating that the fifth class was not necessary for good fit to the model. We also applied the bLRT to the four-class model, which resulted in p=0.02, indicating the three-class model was not sufficient. We thus conducted further analyses with the four-class solution. In the four-class solution, the fit of the quadratic model to the categorical outcomes was good, Likelihood Ratio χ^2 (705, n=660)=552, *ns*, indicating that the quadratic curves were adequate to capture the trajectories.

Table 3 provides the proportion of youth reporting none, low, and high delinquency levels for each of the four classes: non-problem, increasing, desisting, and chronic. The first class —the *non-problem* group—was made up of 29% of the sample. The large majority of these youth show essentially no delinquency across grades 7 to 12. Anywhere from roughly 1 in 10 to 2 in 10 youth report some low level delinquency, and virtually none report any high level delinquency. The second class—the *increasing* group—is the largest and includes 4 in 10 youth in the sample. For lower frequency delinquency, 4 in 10 youth were already involved in either low or high frequency delinquency in grade 7, with most reporting low level delinquency. The proportion increased steadily and doubled by grade 12, with 8 in 10 reporting some delinquency. In addition, the proportion of youth reporting high level delinquency increased steadily across grades 7 to 12.

The third class is the *desister* group and included 15% of the youth. In grade 7, about half of youth reported low level delinquency and 3 in 10 reported high level delinquency. These levels are fairly similar to youth in the chronic pathway. However, unlike the chronic pathway, delinquency levels for these desisters declined steadily over time such that by grade 12, high level delinquency reports were at a near zero level and low level delinquency reports dropped to about 1 in 10 youth. The final class of youth—*chronic* delinquents—included 16% of the sample and reported the highest levels of delinquent activity at all grades. At grade 7, nearly 40% of the sample reported committing at least 11 delinquent acts in the last year and almost half reported low level delinquency. The proportion reporting high level delinquency increased to a high of 79% in grade 10 and then declined slightly through grade 12.

Gender Composition and Prediction of Trajectory Classes

Next, we examined the gender composition of the trajectories and whether males and females differed in their proportions across the classes. Class membership was regressed on gender in a multinomial logistic regression. This test showed that gender was a significant predictor of class membership, χ^2 (3, n=660)=21.4, p<0.001. The model-implied proportions of each gender in the four classes are shown in Table 4.

To facilitate analysis of gender differences within the four classes, individuals were assigned to classes on the basis of the greatest expected *a posteriori* probabilities of membership; that

is, individuals were assigned to the class most likely to produce their specific pattern of delinquency scores. The estimate of entropy from the mixture analysis was 0.663. The proportion of correct classifications was 80.8%. In other words, 4 in 5 youth were correctly classified.

To test the relative proportions of boys vs. girls in each class, we conducted a series of 2 x 2 χ^2 tests of independence comparing membership in the target class vs. any other class as a function of gender. Girls were more likely to be represented in the non-problem group, χ^2 (1)=22.6, p<0.001, whereas boys were more likely to be represented in the desister, χ^2 (1)=15.9, p<0.001, and chronic pathways, χ^2 (1)=32.2, p<0.001. The proportion of boys and girls in the increasing group did not significantly differ, χ^2 (1)=3.3, *ns*.

Taken as a whole, boys were more represented on desisting and chronic pathways. The largest group for both genders, about 4 in 10, was made up of youth on an increasing delinquency trajectory. Looking at the proportions across the chronic and increasing trajectories, the size of the increasing group is almost twice that of the chronic group for boys, whereas there is a four-fold increase between the chronic and increasing groups for girls. Thus, the entry into adolescence appears to be a particular period of risk for girls in terms of increasing delinquent activity.

Trajectory Membership and Age 19 Outcomes

Next, we tested the predictive utility of trajectory classes on outcomes in the year after grade 12: intimate partner violence, depressive symptoms, risky sexual activity (dichotomous), and pregnancy (dichotomous). Again, to facilitate analysis, the outcome analyses were based on manifest class memberships. Table 4 shows the patterns of outcomes (means, T scores or proportions, as appropriate) for the variables as a function of class and gender. For each outcome, we conducted a linear or logistic multiple regression (as appropriate to a categorical or continuous outcome) in M*plus* to take advantage of the missing data functionality. Predictors included trajectory class and gender (both effect-coded) and their interaction, as well as covariates (race [African American vs. other], site, and cohort). Where a main effect of class was significant for a given outcome, we conducted contrasts between the marginal (cross-gender) values of the outcome for each pairwise combination of classes.

The classes varied significantly in predicting partner violence, χ^2 (3)=22.7, p<0.001. The interaction of gender and class was not significant χ^2 (3)=1.90, *ns.* Specific contrasts showed that youth in the nonproblem trajectory reported less partner violence than youth in either the increasing or the chronic delinquency trajectories. In addition, youth in the desisting trajectory reported less partner violence than youth in the chronic trajectory. Partner violence levels did not differ between youth in the increasing and the chronic trajectories.

Depressive symptoms also varied across the classes, χ^2 (3)=8.24, p=0.041. We found no significant gender by class interaction, χ^2 (3)=1.89, *ns*. There were fewer significant pairwise contrasts between the trajectory classes. Youth in the nonproblem class reported significantly fewer depressive symptoms than youth in the increasing class. As with the other outcomes, depressive symptoms did not vary between the increasing and the chronic trajectories.

Risky sexual activity showed a significant main effect of class, χ^2 (3)=17.3, p<0.001. Gender did not moderate the effect of class on risky sexual activity, χ^2 (3)=2.42, *ns.* Pairwise comparisons showed that both the increasing and chronic youth reported higher rates of risky sex than the nonproblem group. Rates of risky sex did not vary between the

nonproblem and the desisting groups, nor did they vary between the chronic and the increasing groups.

Finally, we tested the effect of the trajectories on the number of pregnancies. There were no significant effects of class membership on reports of pregnancy, *p*s>0.13.

Discussion

Studies of developmental pathways focus both on trajectories over time and outcomes from these trajectories. Recognizing that very limited attention has been given how gender impacts these issues, this paper addresses two important questions. First is whether both genders are represented on trajectories of delinquency during the adolescent years. Second is whether the risk conferred on maladjustment as a result of delinquency is similar or different for both genders. This study also focuses on adolescence when few studies of trajectories exist and most girls' delinquency is likely to occur. In this way, the paper is able to address the controversy surrounding the relationship between gender and delinquency and whether developmental patterns are similar or different for boys and girls.

A number of key findings emerge from this study. First, although differences are evident in the proportion of boys and girls on certain pathways, both genders are represented on similar trajectories of delinquency. Second, it is noteworthy that gender does not moderate the effect of trajectory membership on age 19 outcomes. Although power for these analyses is reduced by the classification error introduced in our procedure, none of the interactions of gender by class are significant. Thus, the risks on subsequent depression, partner violence, and risky sexual behavior resulting from the delinquency trajectories are the same for both boys and girls. Overall then, the findings are remarkable for their consistency across gender groups.

These results raise questions about the need for sex-specific theories of delinquency. Our findings are consistent with an increasing number of studies finding more similarities than differences across the genders (e.g., Carmichael et al. 2005; Fagan et al. 2007; Odgers et al. 2008). Most prominent are findings from Moffitt et al.'s (2001) detailed study of sex differences in antisocial behavior among youth in the longitudinal Dunedin longitudinal study. Their results revealed similar longitudinal patterns, risk predictors, and consequences for both genders, and the authors concluded that "…findings point to the overarching conclusions that females' antisocial behavior obeys the same causal laws" (p. xvi).

This is not to say that all aspects of delinquency are constant across gender. This study focuses only on trajectories and outcomes from these trajectories, and we cannot generalize to other domains. Gender differences may exist in other aspects of delinquency not addressed in this study, such as contextual features, motives, and meanings of delinquent activity (Piquero et al. 2005). Nevertheless, overestimating claims of gender differences can bias our understanding of behaviors among both genders (Hyde 2005). Indeed, it was original (and incorrect) claims postulating gender differences—namely, that girls were not delinquent—that promoted the exclusion of girls in previous studies (White and Kowalski 1994). Indeed, there may be many similarities across the genders, and current theories may explain much of girls' delinquency.

The findings do indicate gender differences in the proportion of males and females on certain trajectories, and these variations inform our understanding of the development of girls' delinquency. First, although boys are more likely than girls to be on a chronic delinquent pathway, the results clearly show a small but discernible group of girls whose delinquency is present by early adolescence persists across the teen years. Without delinquency data earlier in childhood, we cannot definitely say that this group would fit the 'early starter' characterization (Moffitt 1993). However, this group was distinguished from

an increasing trajectory of youth whose delinquency did not start until later in adolescence. Early speculations about the lack of early starting girls (e.g., Silverthorn and Frick 1999) may be due to reliance on a narrow definition of antisocial behavior. The use of a broader spectrum of behaviors, including less serious delinquent acts that are captured in this study's measure, may be a better proximal indicator and a good index of early risk (Bierman et al. 2004). These findings also underscore the importance of including both genders in preventive intervention efforts to prevent conduct problems (Fagan et al. 2007).

In contrast with the chronic group, boys and girls are equally likely to show an increasing trajectory of delinquency across adolescence which resembles a late starter pathway. These findings are consistent with Moffitt's (1993) premise that the proportion of males and females was similar for those youth whose antisocial activity did not have its onset until adolescence. To illustrate, analysis of the Dunedin data revealed that, for youth whose antisocial behavior began adolescence, boys outnumbered girls 1.5 to 1, as compared to a 10 to 1 ratio for childhood onset problems (Moffitt et al. 2001).

Although the proportion of boys and girls on this increasing trajectory is similar, relative to earlier starting delinquency, the increase is especially marked for girls. In other words, although both genders are represented on an increasing trajectory, the relatively low level of earlier delinquent activity prior to this period accentuates how delinquency levels rise for a substantial proportion of girls. These findings suggest that the entry into adolescence appears to be a period of risk for girls. We can speculate that earlier in development, girls' advanced social, language, and cognitive functioning, combined with their decreased risk for hyperactivity and other neuropsychological deficits, may be protective during childhood (Keenan and Shaw 1997). However, the transition into adolescence brings with it new tasks and challenges that have significant costs for girls. The increase in peer influences (including boyfriends), along with changes in the parent-child relationship, make this developmental change a difficult one for girls in terms of delinquent behaviors. The tasks of adolescence focus around independence, separation, and personal achievement in opposition to the earlier focus for girls on interpersonal relationships (Rudolph 2002; Pomerantz and Ruble 1998). Earlier socialized traits of dependence for girls are now devalued, and girls need to learn to balance their need for family support with increased needs for autonomy (Zahn-Waxler et al. 2005). Peers also become increasingly influential (including romantic partners), and girls may become newly exposed to male models for whom delinquent activity is a sign of status (Miller-Johnson and Costanzo 2004). Thus, the protective features of girls' interpersonal focus may pose challenges as they must begin to separate and redefine their relationships.

Although not directly related to the question of sex differences, this study does increase our knowledge of delinquency trajectories during adolescence, a time period that has received very little empirical inquiry. We highlight two findings that contribute to our knowledge of developmental models of antisocial behavior during this period. First, evidence for a desisting group shows that delinquent activity can be transient and short-lived during adolescence. Such findings underscore the need for more refined screening and assessment procedures in order to identify those youth at greatest risk for persistent problems. Some interventions, particularly those involving contact with other delinquent youth, may have iatrogenic effects (Dishion and Dodge 2005). In addition, involvement in the juvenile justice system in and of itself is a risk factor for subsequent arrests as youth are labeled in school and in the community (Howell 2003). It will be important for future research to identify those factors that differentiate youth whose delinquency is transient from those whose behavior is indicative of a chronic pathway. Such work is critical in order to target scarce resources for those at greatest risk for persistent delinquency and to minimize any negative effects of treatment or system involvement.

A second finding of interest is that not only were the chronic and the increasing groups at increased risk for maladaptive outcomes, but partner violence, depression, and risky sex outcomes did not vary between youth on increasing and chronic trajectories. These findings suggest that although youth on an increasing trajectory are not as highly delinquent as those on a chronic trajectory, they may be at increased risk for poor outcomes in other important domains. These adjustment problems can serve as 'snares' and entrap moderately delinquent youth, thereby leading to other negative consequences that can limit life options (e.g., early childbearing, risk for HIV/AIDs, problematic partner relationships). Furthermore, these findings have important clinical and policy implications. All too often, service delivery systems (e.g., mental health, juvenile justice, public health) remain isolated in separate silos, and delinquent youth may not receive services that are provided outside of the justice system. Recent studies outline the array of problems seen in delinquent youth, and the need for comprehensive services to address these multiple needs (Teplin et al. 2003; Smith et al. 2006; Skowyra and Cocozza 2007).

This study does have some limitations. The number of highly delinquent girls, while larger than in many other studies, was still low. These findings underscore a well-established fact that most girls are not antisocial, making it difficult to obtain large groups of delinquent girls particularly for more frequent, chronic antisocial behavior. In addition, risky sexual behavior and reported pregnancies relied on single items. Assessment of these constructs presents methodological challenges, and may be biased in terms of the degree of accuracy and potential over- or under-reporting (Schroder et al. 2003). Unfortunately, the larger study did not include multi-item measures that are relevant to these problem outcomes, such as attitudes towards pregnancy, beliefs/intentions about condom use, or resistance skills to avoid high-risk sexual behavior. A number of other studies do rely on similar single-item measures to assess teen pregnancy and high-risk sexual behaviors (e.g., Chandra et al. 2008; Miller-Johnson et al. 2004).

Additionally, the delinquency measure was not available until grade 7, which obviated the identification of pathways earlier in childhood. Participants also attended high-risk schools, and the majority of the sample was in a high-risk control condition and thus at increased risk for problem behaviors. Therefore, the generalizability of the results may be limited. At the same time, the sample was drawn from the community, and as such, results may also not generalize to clinical or court-involved samples. In addition, our opting to use manifest classification for the outcome analyses could be problematic, as regression requires the assumption that the predictors are measured without error, when the trajectory class predictor clearly was. A second methodological issue is the use of growth mixture models at all. In an elegant critique of the method, Bauer and Curran (2003) found that non-normality of the distribution of the indicators could lead to overextraction of trajectory classes; however, our use of an ordinal outcome and appropriate methods for ordinal data minimizes this concern in our view.

Despite these limitations, the study has a number of strengths, including its study of trajectories across adolescence for both genders and its examination of a range of maladaptive outcomes. The findings call into question the need for gender-specific models in explicating developmental trajectories of delinquency and related outcomes.

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Table 1

Delinquent Acts in the Last Year by Gender – Grades 7–12

	Grade											
	7		8		9		10		11		12	
	M	F	M	F	M	F	M	F	M	F	M	F
0	48%	59%	50%	57%	38%	55%	44%	55%	45%	57%	42%	48%
1–10	35%	29%	32%	32%	36%	28%	32%	31%	30%	32%	29%	38%
11+	16%	12%	18%	11%	26%	17%	23%	14%	25%	11%	29%	14%
χ^2	(2, 607)=7.27 *		(2, 575)=7.24 *		(2, 571)=16.79 ***		(2, 548)=10.03 **		(2, 539)=18.71 ***		(2, 551)=19.59 ***	

The numbers reflect the proportion of youth in each cell within gender. The chi square tests gender differences in proportion of delinquent acts at each time point

* $p<0.05$

** $p<0.01$

*** $p<0.001$

Table 2

Descriptive Data—Age 19 Outcome Variables

Partner Violence		Depression		Risky Sex		Pregnancy	
M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
0.36 (0.63)	0.54 (0.70)	40.1 (7.3)	41.1 (8.5)	33%	46%	10%	16%
t (1)=2.78 **		t (1)=1.42, *ns*		χ^2 (1, 561)=9.75 **		χ^2 (1, 561) 4.10 *	

For the continuous variables (i.e., partner violence and depression), values represent means and standard deviations. For the dichotomous variables, values represent the% reporting the outcome mi.e., risky sex or pregnancy). The analyses use listwise deletion.

* p<0.05

** p<0.01

Table 3

Proportion of Youth Reporting None, Low, and High Delinquency by Class

	Class 1 - Non-Problem			Class 2 - Increasing			Class 3 - Desisting			Class 4 - Chronic		
	Girls 38% Boys 22%			Girls 40% Males 41%			Girls 13% Males 16%			Girls 9% Boys 21%		
Grade	**0**	**1–10**	**11+**	**0**	**1–10**	**11+**	**0**	**1–10**	**11+**	**0**	**1–10**	**11+**
7	0.84	0.16	0.02	0.58	0.36	0.06	0.18	0.52	0.30	0.13	0.48	0.39
8	0.90	0.10	0.01	0.52	0.40	0.08	0.18	0.51	0.31	0.05	0.32	0.63
9	0.91	0.08	0.01	0.44	0.45	0.11	0.23	0.53	0.24	0.03	0.22	0.75
10	0.91	0.08	0.01	0.36	0.49	0.15	0.38	0.49	0.13	0.03	0.18	0.79
11	0.88	0.11	0.01	0.28	0.52	0.20	0.65	0.30	0.05	0.03	0.22	0.75
12	0.79	0.19	0.02	0.20	0.52	0.28	0.89	0.10	0.01	0.05	0.32	0.63

0 – none; 1 –10 low; 2 - high

Table 4

Class Membership and Age 19 Outcomes

	Risky Sex			Partner Violence			Depression			Pregnancy		
	Overall	**M**	**F**	**Overall**	**M**	**F**	**Overall**	**M**	**F**	**Overall**	**M**	**F**
C1: Non-problem	0.34	0.27	0.39	0.21	0.17	0.34	38.6	38.1	39.8	0.06	0.01	0.13
C2: Increasing	0.49	0.43	0.55	0.51	0.36	0.58	39.9	39.7	40.3	0.14	0.11	0.19
C3: Desister	0.43	0.41	0.50	0.30	0.28	0.47	40.0	39.8	42.1	0.12	0.10	0.15
C4: Chronic	0.55	0.56	0.50	0.50	0.46	1.08	41.7	41.1	45.3	0.21	0.21	0.21

The numbers reflect proportions for risky sex and pregnancy, t scores for depression, and mean scores for partner violence