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CHAPTER 4

GIRLS' CHILDHOOD TRAJECTORIES OF DISRUPTIVE BEHAVIOR PREDICT ADJUSTMENT PROBLEMS IN EARLY ADOLESCENCE

ABSTRACT

It is widely recognized that early onset of disruptive behavior is linked to a variety of detrimental outcomes later in life. Because most of the research in this domain is based on males, little is known about the association between girls' childhood trajectories of disruptive behavior and adjustment problems in early adolescence. The current study used 9 waves of data from the ongoing Pittsburgh Girls Study. A semi-parametric group based model was used to identify trajectories of disruptive behavior in 1,513 girls from age 6 to 12 years. Depression, PTSD, self-harm, substance use, interpersonal aggression, sexual behavior, affiliation with delinquent peers, and academic achievement were assessed at ages 13 and 14. Four trajectories of childhood disruptive behavior were identified: low, medium-low, medium-high, and high. Girls in the medium-high and high group were combined for further analyses, and were at increased risk for the following adjustment problems in early adolescence: depression, self-harm, nicotine use, illegal substance use, interpersonal aggression, early and risky sexual behavior, affiliation with delinquent peers and lower academic achievement. The likelihood of multiple adjustment problems increased with trajectories reflecting higher levels of disruptive behavior. Girls following higher childhood trajectories of disruptive behavior require early intervention programs to prevent multiple, adverse outcomes in adolescence and further escalation in adulthood.

INTRODUCTION

Because disruptive behavior was thought to be rare in girls, most research examining trajectories of disruptive behavior has focused on boys. In recent years, research has consistently shown that despite sex differences in prevalence, girls are involved in disruptive behavior, which emerges within girls at different ages and follows diverse patterns (for a review, see Fontaine, Carbonneau, Vitaro, Barker, & Tremblay, 2009). An important reason to further research the course of girls' disruptive behavior is that conduct disordered girls are especially at risk for a wide range of multiple impairments in adulthood, such as low educational attainment, substance dependence, criminal charges, young age at first birth, and adverse parenting skills (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Pajer, 1998), which are known risk factors in the transmission of disruptive behavior to offspring (Tremblay, 2010). Yet, the scant research on girls' trajectories of disruptive behavior is mostly based on clinical samples and official crime data, or is limited by small sample sizes. However, in a few exceptions trajectories of girls' disruptive behavior have been reported in large longitudinal population samples (i.e., Barker & Maughan, 2009; Bongers, Koot, van der Ende, & Verhulst, 2004; Côté, Zoccolillo, Tremblay, Nagin, & Vitaro, 2001; Odgers et al., 2008), but these studies rely on predominantly white samples. The current study aims to improve the generalizability of the current knowledge on the course of girls' disruptive behavior, by identifying childhood trajectories using a large, ethnically diverse community sample of girls.

Current theoretical models agree that children with early onset of disruptive behavior tend to experience more detrimental outcomes later in life, including continued antisocial behavior, mental health problems and high service use in adulthood, compared with children with a later onset of disruptive behavior (Herrenkohl et al., 2010; Loeber et al., 1993; Moffitt, Caspi, Rutter, & Silva, 2001). Evidence during the past decade has emerged to show the existence of a small group of girls with early onset disruptive behavior (Côté et al., 2001; Odgers et al., 2008). Moreover, recent findings from the Pittsburgh Girls Study indicate that a childhood onset of girls' conduct problems may be more common than an onset during adolescence (Keenan, Wroblewski, Hipwell, Loeber, & Stouthamer-Loeber, 2010). Furthermore, Odgers and colleagues (2008) indicated that girls with a childhood onset are more likely to have severe consequences in adulthood, compared with girls with an adolescent onset. From an early intervention perspective, this makes childhood a key developmental period to study girls' disruptive behavior.

Childhood disruptive behavior has shown to be mirrored by the development of comorbid problems (Barker, Oliver, & Maughan, 2010) and may be associated with various adverse outcomes later in life via a snowball effect. Thus, it has been suggested that consequences of disruptive behavior result in an accumulation of difficulties extending across the years into adulthood (e.g., Masten & Cicchetti, 2010). Following this theoretical model, the relationship between childhood disruptive behavior and adult adversity may not be direct

and it is likely that adjustment problems escalate, diversify, and increasingly interfere with normal adolescent development. For example, girls tend to be socialized in ways that actively discourage disruptive behavior, and the societal pressure against this behavior may reduce disruptive behavior but have the effect of heightening girls' risk for internalizing problems. Convergent evidence from prior research confirms that depression emerges subsequent to conduct problem behavior in girls (Hipwell et al., 2011; Moffitt et al., 2001). In addition, conduct disordered girls' tendency to violate social norms appears to be reflected in the association with sexual risk behavior, substance use, affiliation with deviant peers, and low academic achievement (Bardone et al., 1996; Masten et al., 2005). However, little is known about the negative consequences of girls' early childhood disruptive behavior in adolescence. Examining whether childhood disruptive behavior predicts adjustment problems in early adolescence may provide us with targets to prevent the escalation of negative consequences through the lifespan.

The present study aims to advance knowledge on the course of girls' disruptive behavior, by identifying childhood trajectories and investigating the extent to which they predict adjustment problems in adolescence, using a large ethnically diverse community sample of girls. We will first determine distinct trajectories of girls' childhood disruptive behavior between 6 and 12 years. Based on extant research on predominantly white samples we expect that distinct trajectories of childhood disruptive behavior can be identified as most studies on childhood disruptive behavior found 3 to 4 trajectories of deviant behavior (e.g., Broidy et al., 2003; Côté et al., 2001). Second, in order to improve understanding of the negative consequences of girls' childhood disruptive behavior through the lifespan, we examined adverse outcomes in adolescence by following different childhood trajectories of disruptive behavior. We expect that girls with higher levels of disruptive behavior are at higher risk for adjustment problems in early adolescence. Finally, given that antisocial behavior is linked with multiple adverse outcomes later in life, we hypothesized that girls who follow a trajectory of high disruptive behavior will have a greater number of adjustment problems compared with girls on trajectories of low disruptive behavior.

METHODS
Participants
Participants are part of the Pittsburgh Girls Study (PGS), an ongoing longitudinal study examining the development of conduct problems in 2451 inner-city girls, who were recruited into the study between 1999-2000 by means of a citywide survey of 103,238 households. In this process, disadvantaged neighborhoods were oversampled to increase the likely prevalence of girls' conduct problems. The PGS sample consists of four age cohorts who were ages 5 (N = 588), 6 (N = 630), 7 (N = 611) and 8 (N = 622) at the start of the study.

Follow-up assessments occur yearly and information is gathered using primary caregiver, teacher and child report (for further details, see Keenan et al., 2010).

Figure 1. Design of current study by age, cohort and wave.

	Age								
	6	7	8	9	10	11	12	13	14
Cohort 6	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Cohort 7		Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8
Cohort 8			Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7

■ Childhood trajectories ■ Outcome young adolescence

The current study incorporates the three oldest cohorts (N = 1,863 girls), who were age 6-8 at the first assessment (see Figure 1). Cohort 5 was excluded because the data at 14 years of age were not available. For the current analyses, we used data from the annual assessment waves 1 to 9, spanning girls' ages 6 to 14 years (retention rates ranged from 98.6% at age 7 to 89.7% at age 14). The total N at ages 6 and 7 differed from ages 8-14 due to the accelerated longitudinal design. The racial distribution of the girls was 53.5% African American, 40.7% European American and 5.9 % were multiracial. At the first assessment, 41.8% of the girls lived in a single parent household, 38.1% of the families were receiving public assistance, and 52.5% of the mothers had received more than 12 years of education.

Procedure

All study procedures were approved by the University of Pittsburgh Institutional Review Board. Written informed consent from the caregiver and assent from the child were obtained prior to data collection. Interviews were conducted separately at home with caregiver and daughter by trained interviewers and lasted about 2-3 hours each. The participants were reimbursed for their involvement in the study.

Measures

Caregiver reports of childhood disruptive behavior, and girl self-reports of these behaviors in adolescence were used to reduce the effects of shared variance.

Girls' Disruptive Behavior in Childhood. Caregivers reported yearly on items from the Child Symptom Inventory-4 (CSI-4; Gadow & Sprafkin, 1994) that assessed DSM-IV symptoms of Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (American Psychiatric Association, 1994). Each symptom was rated on a 4-point scale ranging from 0 (never) to 3 (all the time). All eight DSM-IV ODD symptoms were assessed across all waves. All 15

DSM-IV CD symptoms were assessed from wave 4 onwards. In waves 1-3, two CD symptoms (truancy and running away) were not administered because they were not deemed age appropriate. These two items were coded as if they were absent (score = 0). Cronbach's α for assessments between the ages of 6 and 12 ranged from 0.82 to 0.87. Because prior analyses demonstrated that CD and ODD load on the same factor (Loeber et al., 2009), we used a total disruptive behavior score by summing ODD and CD symptoms.

Girls' Adjustment Problems in Early Adolescence. We used several measurements to examine adjustment problems at age 13 and 14. The adolescent outcomes represent i) internalizing problems, ii) substance use, and iii) other detrimental outcomes such as risky behaviors and low academic achievement. Outcome data were merged across ages 13 and 14, and each binary outcome was affirmative when at least outcome at age 13 *or* age 14 was positively endorsed.

Internalizing problems. Girls reported on items from the Adolescent Symptom Inventory-4 (ASI-4; Gadow & Sprafkin, 1994) that correspond with DSM-IV (American Psychiatric Association, 1994) symptoms of *Depression*. As with the CSI-4, each symptom was rated on 4-point scales ranging from 0 (never) to 3 (all the time). Symptoms count scores (0 = never / sometimes, 1 = often/very often) were used, in which each symptom represents a clinically relevant problem if it is rated as 'often' or 'very often'. Diagnosis of depression was estimated (given the absence of information on functional impairment) using DSM-IV criteria.

A single question on hurting oneself (e.g., cutting, or burning) in the past year was used to measure *self-harm* (0 = no, 1 = yes,).

The Child PTSD Symptom Scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001) is a self-report measure designed to diagnose and assess DSM-IV symptoms of *Post Traumatic Stress Disorder* (PTSD) in children and adolescents. If the event items are endorsed, 17 symptom items are then administered and rated on a 4-point frequency scale (0 = not at all, to 3 = 5 or more times a week) and summed to generate a total score. Functional impairment items are scored as 0 = absent or 1 = present. Girls were rated as having PTSD using a cutoff score of 11 (Foa et al., 2001).

Substance use. Nicotine use and *illegal substance use* (i.e., alcohol, marijuana, cocaine, stimulants, sedative-hypnotics, opioids, and hallucinogens) were assessed using girls' report on the Nicotine, Alcohol and Drug Substance Use scale (NADU), adapted from an instrument of the Rutgers Health and Human Services Project (Pandina, Labouvie, & White, 1984). NADU items concerning frequency of each substance use during the past year were assessed on an 8-point scale (0= I did not within the past year to 7 = every day or more than once a day). The data were reduced to binary variables, indicating the use of nicotine or any illegal substance, more than 5 times in the past year (0-1 = 5 or less times vs. 2-8 = 5 times or more).

Other detrimental outcomes. To measure *interpersonal aggression*, we used four items of the Self Reported Delinquency Scale (Loeber, Farrington, Stouthamer-Loeber, & van Kammen,

1998). Girls responded to the frequency of their involvement in each aggressive behavior in the past year (i.e., assault, robbery, attack with weapon, and gang fight) at age 13 and age 14. The data were reduced to a binary variable indicating girls' endorsement of any of the examined behaviors.

Early and *Risky sexual behaviors* were assessed using girls' report on items of the Adolescent Sexual Activity Index (ASAI) (Hansen, Paskett, & Carter, 1999). A binary early sex index was created indicating any of the following three items; i) had intercourse ever (at age 13), ii) had intercourse in the past year, and iii) had oral sex in the past year. A binary risky sex index was also created indicating any of the following four items: i) had sexual intercourse with two or more partners in the past year; ii) did not 'always' use birth control, and/or did not use condoms; iii) had been pregnant in the past year; and iv) had an STI in the past year.

Affiliation with Deviant Peers was measured at age 13 and age 14 by girls' report of participation of friends in various deviant behaviors (e.g., shoplifting, vandalism) in the last six months using an abbreviated version of the Peer Delinquency Scale (Loeber et al., 1998). The number of deviant behaviors in which there was peer involvement was summed to generate a total peer delinquency score. A binary variable was created by cutting this variable at the 75% percentile with upper quartile scores representing high deviant peer involvement.

Low academic achievement was assessed by girls' evaluation on the following four Child Behavior Checklist (CBCL; Achenbach, 1991) items on a 4-point scale: reading, math, writing and spelling. Data were reduced to a binary variable indicating girls who scored below the 25th percentile on this scale.

To measure accumulation of adversities, we created a *total adjustment problem score* by summing all the binary adjustment problems (range = 0-11).

Data analyses

Analyses proceeded in three steps. First, we used a semi-parametric group based model to identify distinct trajectories of girls' disruptive behavior across childhood, using a SAS-based procedure (Jones, Nagin, & Roerder, 2001; Nagin, 2005). Besides estimating trajectories, the group-based model produces a posterior probability of membership for each of the disruptive behavior trajectory groups for each girl in the sample. All girls were assigned to the trajectory group of their highest probability.

An important issue in the application of group based models concerns the determination of how many groups define the best solution to fit the data. Model selection in our study was based on the procedure outlined by Nagin (2005). First, we estimated models distinguishing from one up to ten groups. The Bayesian Information Criterion (BIC) is an often used test statistic for model selection, and the model with the largest BIC value is usually preferred. For comparing the BIC values for each subsequent model we used approximations of the Bayes factor provided by Kass and Wasserman (1995) to calibrate the substantive importance of

differences in BIC scores across models.[1] However, as reported in several other studies (e.g., Loughran & Nagin, 2006; Blokland, Nagin, & Nieuwbeerta, 2005), in our data BIC values kept increasing when additional groups were distinguished. According to Nagin (2005), in such instances, model selection must balance model parsimony and the objective of revealing distinct features of the data, preventing selection of a model distinguishing a large number of trajectories with little practical difference. Adding additional trajectories may also result in group sizes too small to be reliably interpreted. In our data, adding groups beyond four, resulted in the model breaking down the lower-level trajectories of the four group model into separate trajectories that were parallel to the those of the four group model, but differed slightly in overall level. As adding groups beyond four did not reveal any important features in our data, for reasons of parsimony and comprehensibility, we therefore selected the four group model. The four group model performed well on other criteria for model selection. First, all group sizes were above 2% of the sample. Second, the average posterior probability of group membership – the average probability that an individual with a specific behavioral profile belong to a specific trajectory group – was well above the recommended minimum of .7. Third, we also calculated the odds of correct classification (OCC_j), a measure that compares the odds of a correct classification in $group_j$ based on the maximum probability assignment rule, to that based on the estimated population base rate. Larger values of OCC_j indicate better assignment accuracy, and values above 5 are indicative of high accuracy. In our final four group model OCC_j are all above 9.5. Finally, for the four group model there is high correspondence between a group's estimated probability and the proportion of individuals classified to the group based on the maximum probability assignment rule, which also indicates model adequacy.

To further test the robustness of our findings we estimated separate trajectory models on the different PGS-cohorts to check for cohort effects. Applying the above mentioned criteria, the four group model was the preferred model in all cohorts, and trajectories proved to be highly similar in both level and shape. Furthermore, trajectory models estimated separately for white and non-white respondents also did not show any substantive differences. Given the similarity of findings across different subsets of our data, we only report on the analyses on the entire sample here. Results of the additional analyses are available from the authors.

Second, in order to examine whether the prevalence rates of adjustment problems in early adolescence differed by trajectory groups of girls' disruptive behavior, we estimated odds ratios (OR) and 95% confidence intervals (CI) using logistic regression. Finally, we investigated the relationship between trajectory groups and the accumulation of adjustment problems in early adolescence using negative binomial regression. *Post hoc* comparisons were adjusted for multiple calculations with the Bonferroni procedure. Taking into account

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[1] We calculated both $e^{BIC_j} - B^{ic_j}$ for pair wise comparisons of the various models, and $\frac{e^{BIC_j} - B^{ic_{max}}}{\sum_j e^{BIC_j} - B^{ic_{max}}}$ for comparing multiple models (Nagin, 2005; Kass & Wasserman, 1995).

the large size of the sample and the multiple tests executed, all analyses were conducted at a 0.01 significance level.

RESULTS
Identifying trajectories of girls' disruptive behavior

A four-trajectory quadratic group model solution best fit the girls' disruptive behavior scores between ages 6-12 (BIC = -28573.17). The BIC scores for the 2- and 3-group models were -29741.48 and -28936.17 respectively. The average posterior probabilities remained modest to high (ranging from 0.89 to 0.97), indicating a good model fit. Figure 2 depicts the actual and the predicted trajectories. Girls included in each group demonstrated parallel shapes between the ages 6 and 12, but differed from each other in their level of disruptive behavior. The bulk of the sample fell into two groups with the lowest levels of disruptive behavior, which are labeled *low* (N = 707; 37.9% of the sample) and *medium-low* (N = 858; 46.1% of the sample). Both trajectories had relatively stable levels of disruptive behavior, with a slight decrease between age 6 and age 12. A third group had a *medium-high* (N = 245; 13.2% of the sample) level of disruptive behavior, which also showed little variation over time. In addition, 2.8% of girls (N = 53) engaged in the highest levels of disruptive behavior over time, with an increase over time that peaked at age 10.

Figure 2. Girls' disruptive behavior trajectories in childhood.
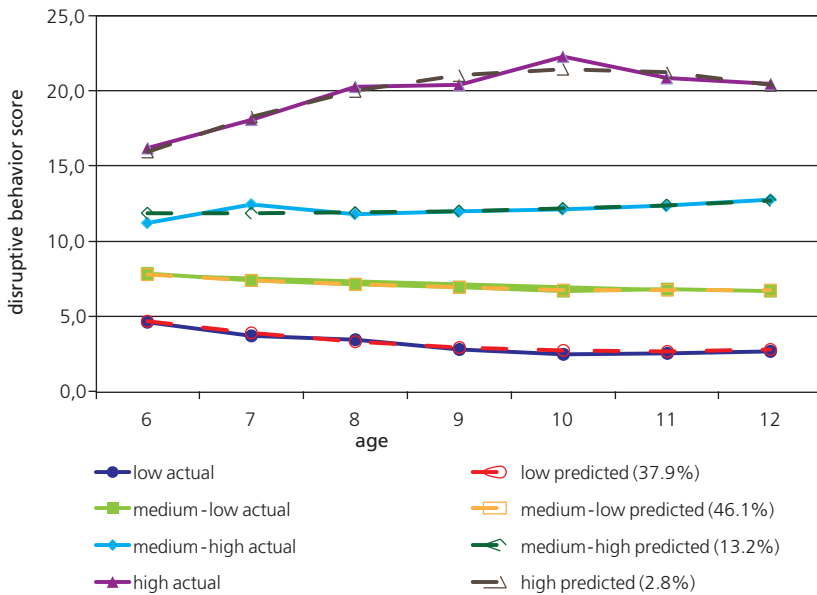
Note. Individuals were assigned to the group of highest probability to compute prevalence.

Predicting adjustment problems in adolescence

We compared the four trajectory groups on several outcomes in early adolescence (age 13-14), to examine whether trajectory groups of girls' disruptive behavior are related to elevated proportions of adjustment problems. Prevalence of adjustment problems increased with trajectory groups. However, because the high trajectory contained relatively few girls (N =53), the power for testing differences with other groups was reduced. In order to compare girls with higher levels of disruptive behavior compared to girls following trajectories of lower levels of disruptive behavior, we combined the medium-high and high group for further analyses.

With regard to internalizing problems, girls in the combined high group experienced a higher risk for depression and were more likely to hurt themselves compared to girls in the low group and girls in the medium-low group (see Table 2). No differences were found between the low and medium-low groups. PTSD did not discriminate between any of the trajectory groups, which may have been due to the relatively low population base rate of this disorder (only 29 girls in the sample, 1.7%, met the criteria for PTSD).

With regard to substance use, trajectory groups significantly differed on nicotine use and illegal substance use. Girls in the combined high group of disruptive behavior were more likely to smoke or use illegal substances compared to the low group. In addition, girls in the medium-low group were more likely to use illegal substances than girls in the low group. No differences were found between the combined high group and the medium-low group.

The analyses for the other adjustment problems in early adolescence, revealed that compared to both the lower groups, girls in the combined high group were more at risk of displaying interpersonal aggression, early sexual behavior and risky sexual behavior. In addition, they were more likely to associate with delinquent friends and show lower academic achievement in school. Girls following the two lowest trajectories of disruptive behavior were not different from each other with regard to these behaviors.

Results of the negative binomial regression revealed that adjustment problems increasingly accumulated in girls following higher trajectories of disruptive behavior (Likelihood Ratio χ^2, = 49.07, df = 2, p < 0.01). The combined-high group (M = 2.07, SD = 2.00) had more adjustment problems in early adulthood compared to the medium-low (M = 1.37, SD = 1.59) and low groups (M = 1.11, SD = 1.42).

Table 1. Prevalence of Girls' Adjustment problems by Trajectory Group at Early Adolescence.

	Trajectory Groups			Comparison Trajectory Groups					
	Low	Medium-Low	Combined High	Low vs Medium-low		Low vs Combined High		Medium-low vs Combined High	
	(N= 707)	(N= 858)	(N= 298)						
	%	%	%	OR	95% CI	OR	95% CI	OR	95% CI
Internalizing problems									
Depression	8.7	10.5	16.7	1.2	(0.9, 1.8)	2.1***	(1.4, 3.2)	1.7**	(1.2, 2.5)
Self-harm	3.4	4.5	9.2	1.3	(0.8, 2.3)	2.9***	(1.6, 5.2)	2.2**	(1.3, 3.7)
PTSD	1.4	1.7	2.5	1.2	(0.5, 2.8)	1.8	(0.7, 4.9)	1.5	(0.6, 3.8)
Substance use									
Nicotine use	5.9	8.2	12.8	1.4	(0.9, 2.2)	2.3***	(1.5, 3.8)	1.7	(1.1, 2.6)
Illegal substance use	20.7	28.3	34.2	1.5***	(1.2, 1.9)	2.0***	(1.5, 2.7)	1.3	(1.0, 1.8)
Other									
Interpersonal aggression	15.8	17.5	30.9	1.1	(0.9, 1.5)	2.4***	(1.7, 3.3)	2.1***	(1.5, 2.9)
Early sexual behavior	7.0	11.0	19.0	1.6	(1.1, 2.4)	3.1***	(2.0, 4.9)	1.9**	(1.3, 2.8)
Risky sexual behavior	7.0	9.0	15.7	1.3	(0.9, 2.0)	2.5***	(1.6, 3.9)	1.9**	(1.2, 2.9)
Peer delinquency	22.8	24.2	33.7	1.1	(0.9, 1.4)	1.7***	(1.3, 2.3)	1.6**	(1.2, 2.1)
Low academic achievement	20.1	25.6	37.7	1.4	(1.1, 1.8)	2.4***	(1.8, 3.3)	1.8***	(1.3, 2.3)
	M (SD)	M (SD)	M (SD)	$F(df = 2)$					
Total adjustment problems	1.18 (1.53)	1.60 (1.81)	3.17 (2.55)	35.86***		Post Hoc Comparison			
						Low < Medium-Low < Combined High			

$** \, p < .01, \, *** \, p < .001$

DISCUSSION

The current research extends knowledge on distinct childhood trajectories of girls' disruptive behavior, and how these trajectories predict adjustment problems in early adolescence in a large community sample of girls. Three main findings emerge from this study. First, four groups of girls were identified who differ in their level of disruptive behavior. Second, girls in the combined high group of childhood disruptive behavior were more at risk for internalizing problems, substance use, and other adjustment problems in early adolescence. Finally, adjustment problems were more likely to be multiple with higher trajectories of girls' disruptive behavior in childhood.

The findings support the notion of an early pre-adolescent onset of disruptive behavior in girls, with two groups following medium-high (13.2%) and high (2.8%) trajectories of disruptive behavior. The relatively stable course was similar to those found in other studies that examined girls' deviant behavior in childhood (Broidy et al., 2003; Côté et al., 2001; Fontaine et al., 2008). However, our results differed in that we found slightly higher proportions of girls on higher trajectories (16%) compared to other studies on girls' disruptive behavior in childhood (who found 11% and 9% respectively; Côté et al., 2001; Schaeffer et al., 2006). This difference may be explained by variance in the methods used in each study and the type of behaviors that are studied. For example, disadvantaged neighborhoods were oversampled in our sample, and caregivers (primarily mothers) were used as informants to rate girls' disruptive behavior, while most other studies base the trajectories on teacher rated behavior in predominantly white samples (e.g., Côté et al., 2001; Schaeffer et al., 2006). Nevertheless, the study supports the notion that an early-starter pattern exists. Relatively parallel shapes of girls' disruptive behavior trajectories suggest that girls do not follow qualitatively different courses in childhood, but that their levels of disruptive behavior vary in severity.

Findings of this study demonstrated that different trajectories of childhood disruptive behavior predicted different levels of adjustment problems. Girls with the highest levels of disruptive behavior in childhood were at increased risk for nearly all of the examined adjustment problems in early adolescence. The combined-high group of childhood disruptive behavior was at increased risk for internalizing problems such as depression and self-harm. This high group also most often used nicotine, illegal substances, displayed early and risky sexual behavior and interpersonal aggressive behavior, had more delinquent friends and lower academic achievement in early adolescence. Moreover, adjustment problems accumulated disproportionately in the combined high group. These findings are similar to the patterns found in studies that examined the association between girls' disruptive behavior and psychosocial functioning in adulthood (Bardone et al., 1996; Odgers et al., 2008). However, our study highlights that multiple adverse conditions are already present in early adolescence following on from childhood disruptive behavior.

Several limitations of the present study should be noted. First, we used a female inner-city sample and therefore generalization to other populations must be made with caution. Second, heterogeneity in the growth of disruptive behavior is ignored by a trajectory-based method. As a result, transient behavioral patterns may be missed. Finally, the study only covered trajectories in childhood. If data waves through adolescence to adulthood were also included, the number and the slope of the trajectories are likely to change. For example, Odgers and colleagues (2008) detected additional trajectories when girls were followed into adulthood, such as a group of girls with an early onset that limited disruptive behavior to childhood.

Despite these limitations, the findings suggest that girls who display disruptive behavior in childhood should be targeted for prevention programs. The relatively stable course of higher trajectories of disruptive behavior indicates that girls with increased levels of disruptive behavior at age 6 are likely to also do so at age 12. Also, consistent with the notion that early conduct problems cause a snowball effect (Masten & Cicchetti, 2010), the combined high group had a wide range of various adjustment problems in early adolescence. Emerging adjustment problems in early adolescence, such as depression, affiliations with delinquent peers and low academic achievement may enhance continuity of disruptive behavior and adjustment problems through adolescence and are likely to prohibit girls from developing social and psychological skills needed for adulthood. Interventions should also aim at reducing early and risky sexual behavior, as prior research demonstrated that conduct disordered girls are likely to become pregnant at an early age (Bardone et al., 1996), which may hinder, for example, educational attainment and later job opportunities. Besides that, most of the accumulated adjustment problems are known risk factors for disruptive behavior in children (Tremblay, 2010), which increases the risk on intergenerational transmission of disruptive behavior in offspring. Thus, childhood might be an important period in which targeting girls with elevated levels of disruptive behavior for (long-term) intervention of disruptive behavior and co-developing adjustment problems may inhibit escalation through adolescence and adulthood.