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Girls' childhood trajectories of disruptive behavior predict adjustment problems in early adolescence

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Abstract

Background—It is widely recognized that early onset of disruptive behavior is linked to a variety of detrimental outcomes in males later in life. In contrast, little is known about the association between girls' childhood trajectories of disruptive behavior and adjustment problems in early adolescence.

Methods—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. Adjustment problems were characterized by depression, self-harm, PTSD, substance use, interpersonal aggression, sexual behavior, affiliation with delinquent peers, and academic achievement at ages 13 and 14.

Results—Three trajectories of childhood disruptive behavior were identified: low, medium, and high. Girls in the high group were at increased risk for depression, self-harm, PTSD, illegal substance use, interpersonal aggression, early and risky sexual behavior, and lower academic achievement. The likelihood of multiple adjustment problems increased with trajectories reflecting higher levels of disruptive behavior.

Conclusion—Girls following the high childhood trajectory of disruptive behavior require early intervention programs to prevent multiple, adverse outcomes in adolescence and further escalation in adulthood.

Keywords

Girls; disruptive behavior; trajectories; adjustment problems

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Introduction

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 known to be at especially high risk for a range of multiple impairments in adulthood, including low educational attainment, substance dependence, criminality, young age at first birth, and negative parenting practices (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. 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. It may be not valid to assume homogeneity within ethnic groups with regard to trajectories of disruptive behavior, as ethnic differences were found in risk factors that impact the development of disruptive behavior (e.g., Lansford, Deater-Deckard, Dodge, Bates, & Petit, 2004). The current study aims to improve the generalizability of 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 tends to develop with 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). According to this cumulative 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 may have the effect instead 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 on adolescent adjustment. 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. 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 have 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. The use of a large ethnically diverse community sample of girls enabled us to take into account the role of ethnicity in these analyses.

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).

The current study focuses on the three oldest cohorts (N = 1,863 girls), who were ages 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

Childhood disruptive behavior was assessed via caregiver report, and adolescent adjustment was assessed by girl self-report to reduce any effects of shared method 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 severity scores.

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 combined across ages 13 and 14, and each binary outcome was affirmative when endorsed at age 13 and/or age 14.

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). Symptom 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) during 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 adapted from Elliott, Huizinga, & Ageton, 1985). Girls reported on 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 to indicate which 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 & 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), BIC values kept increasing in our data 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. In our data, adding groups beyond three resulted in group sizes being too small to be reliably interpreted in further analyses. As adding groups beyond three did not reveal any important features in our data, for reasons of parsimony and comprehensibility, we therefore selected the three-group model. The three-group model performed well on other criteria for model selection. First, all group sizes were above 5% of the sample. Second, the average posterior probability of group membership – the average probability that an individual with a specific behavioral profile would 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 three-group model OCC_j are all above 9.5. Finally, for the three-

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

group model there is high correspondence between a group's estimated probability and the proportion of individuals classified in 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 three-group model was the preferred model in all cohorts, and trajectories proved to be highly similar in both level and shape.

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. All analyses were conducted at a 0.05 significance level.

Results

Identifying Trajectories of Girls' Disruptive Behavior

A three-trajectory quadratic group model solution best fit the girls' disruptive behavior scores between ages 6–12 (BIC = −28936.17). The BIC scores for the 1- and 2- group models were −31556.04 and −29741.48 respectively. The average posterior probabilities remained modest to high (ranging from 0.91 to 0.95), 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 = 955; 51.3% of the sample) and *medium* (N = 786; 42.2% of the sample). Both trajectories had relatively stable levels of disruptive behavior, with a slight decrease between age 6 and age 12. In addition, 6.5% of girls (N = 122) engaged in the highest level of disruptive behavior over time, with an increase over time that peaked at age 11. Trajectory models were estimated separately for white and non-white respondents and did not show any substantive differences. Trajectories of girls' disruptive behavior proved to be highly similar in both level and shape. Given the similarity of findings, we only report on the analyses on the entire sample here.

Predicting Adjustment Problems in Adolescence

We compared the three 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.

With regard to internalizing problems, girls in the high group experienced a higher risk for PTSD and were more likely to hurt themselves compared to girls in the low group and girls in the medium group (see Table 2). In addition, girls in the high group were more at risk for depression than girls in the low group. No difference was found for depression between the high and the medium group. Further, girls in the medium group were more likely to hurt

themselves and more at risk for depression than girls in the low group. For PTSD, no differences were found between the low and medium group.

With regard to substance use, trajectory groups significantly differed on nicotine use and illegal substance use. Girls in the high group of disruptive behavior were more likely to use illegal substances compared to the low group. In addition, girls in the medium-low group were more likely to smoke or use illegal substances than girls in the low group. Despite a slightly higher prevalence of nicotine use compared to the medium group, the high group did not significantly differ from the low group. Further, no differences were found between the high group and the medium group.

The analyses for the other adjustment problems in early adolescence, revealed that compared to both the low and medium group, girls following the high group of disruptive behavior were more at risk of displaying interpersonal aggression, early sexual behavior and risky sexual behavior. In addition, they were more likely to show lower academic achievement in school. Except for risky sexual behavior, girls in the medium group of disruptive behavior were more at risk than girls in the low group with regard to these behaviors. Peer delinquency did not discriminate between any of the trajectory groups.

Results of the negative binomial regression revealed that adjustment problems increasingly accumulated in girls following higher trajectories of disruptive behavior (Likelihood Ratio $\chi^2 = 43.75$, $df = 2$, $p < 0.05$). The high group (M = 2.23, SD = 2.08) had more adjustment problems in early adolescence compared to the medium (M = 1.56, SD = 1.73) and low group (M = 1.14, SD = 1.42).

To test whether trajectories of disruptive behavior were mediated by ethnicity in the prediction of adjustment problems in early adolescence, we reanalyzed data and added a minority status by trajectory group interaction term. Results demonstrated no significant effects of the interaction term and any of the adjustment problems, indicating that effects were similar across ethnic groups.

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, three groups of girls were identified who differ in their level of disruptive behavior. Second, girls in the high group of childhood disruptive behavior were more at risk for internalizing problems, illegal substance use, and other adjustment problems in early adolescence. Finally, multiple adjustment problems were more likely within 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 a group following a high (6.5%) trajectory 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 lower proportions of girls on higher

trajectories compared to other studies on girls' disruptive behavior in childhood (who found 11% and 9% respectively; Côté et al., 2001; Schaffer 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, 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 level of disruptive behavior in childhood were at increased risk for nearly all of the examined adjustment problems in early adolescence. The high group of childhood disruptive behavior was at increased risk for internalizing problems such as depression, self-harm and PTSD. This high group also most often used illegal substances, displayed early and risky sexual behavior and interpersonal aggressive behavior, and had lower academic achievement in early adolescence. Moreover, adjustment problems accumulated disproportionately in the high group. The fact that no significant differences were found for nicotine use could be explained by the fact that this is more normative behavior compared to illegal substance use. It is surprising that no differences were found for girls' affiliation with delinquent peers. This could be explained by lack of statistical power, given that the prevalence rate increased by higher groups. Therefore, replication of this effect is warranted. Nonetheless, the results show clearly that the highest group is at high risk for adjustment problems in early adolescence. 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.

An important additional contribution of this study is the examination of effects of ethnicity on girls' disruptive behavior. Findings did not support differential trajectory patterns of childhood disruptive behavior. Furthermore, ethnicity did not moderate associations between trajectories of girls' disruptive behavior and subsequent adjustment problems in early adolescence. Thus, the effects that were found in this study operated similarly across ethnic groups.

Several limitations of the present study should be noted. First, we used a female inner-city sample and therefore the results may not generalize to other populations. 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 but childhood-limited disruptive behavior.

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 the highest trajectory of disruptive behavior indicates that, regardless of ethnic background, girls with increased levels of disruptive behavior at age 6 are likely to continue to have high levels at age 12. Also, consistent with the notion that early conduct problems cause a snowball effect (Masten & Cicchetti, 2010), the high group had a wide range of various adjustment problems in early adolescence. Emerging adjustment problems in early adolescence, such as internalizing problems, interpersonal aggressive behavior, and low academic achievement may enhance continuity of disruptive behavior and adjustment problems through adolescence and are likely to prohibit girls from developing key social and psychological skills needed for adulthood. Interventions should also aim at reducing early and risky sexual behavior, as prior research has 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 risk factors that are known to transmit disruptive behavior to offspring (Tremblay, 2010). 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.

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Key points

- The present study distinguished low, medium, and high trajectories of girls' disruptive behavior
- Compared to the low and medium groups, the combined high group had elevated rates of depression, self-harm, nicotine use, illegal substance use, violent behavior, early and risky sexual behavior, delinquent peers and lower academic achievements in early adolescence
- Adjustment problems in early adolescence accumulated in girls following higher trajectories of childhood disruptive behavior
- Associations between trajectories of girls' disruptive behavior and subsequent adjustment problems in early adolescence were not moderated by ethnicity
- Treatment of girls' disruptive behavior in childhood may prevent escalation of negative consequence later in life

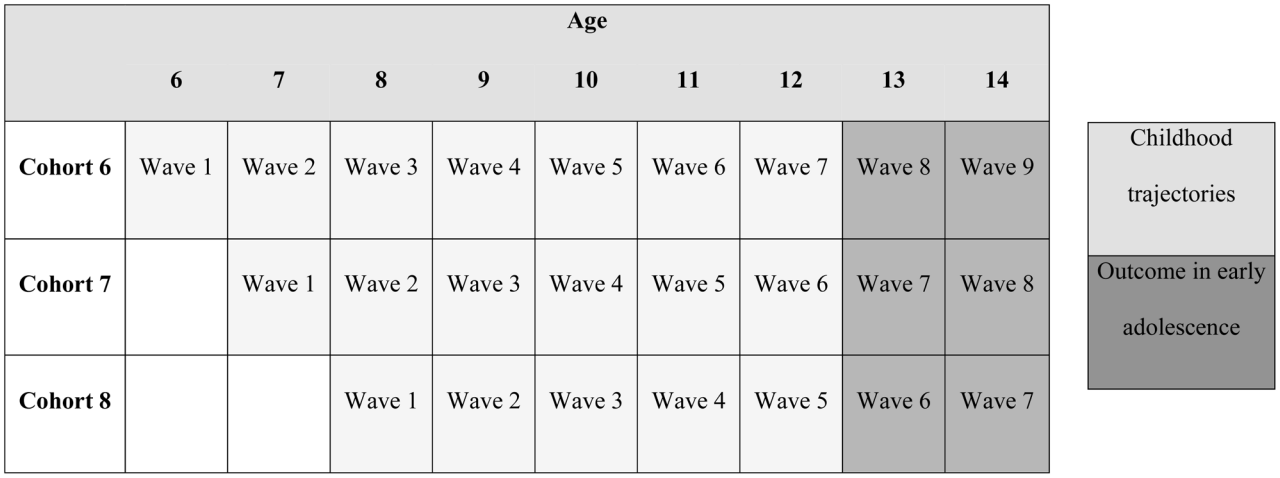

Figure 1.
Design of Current Study by Age, Cohort and Wave

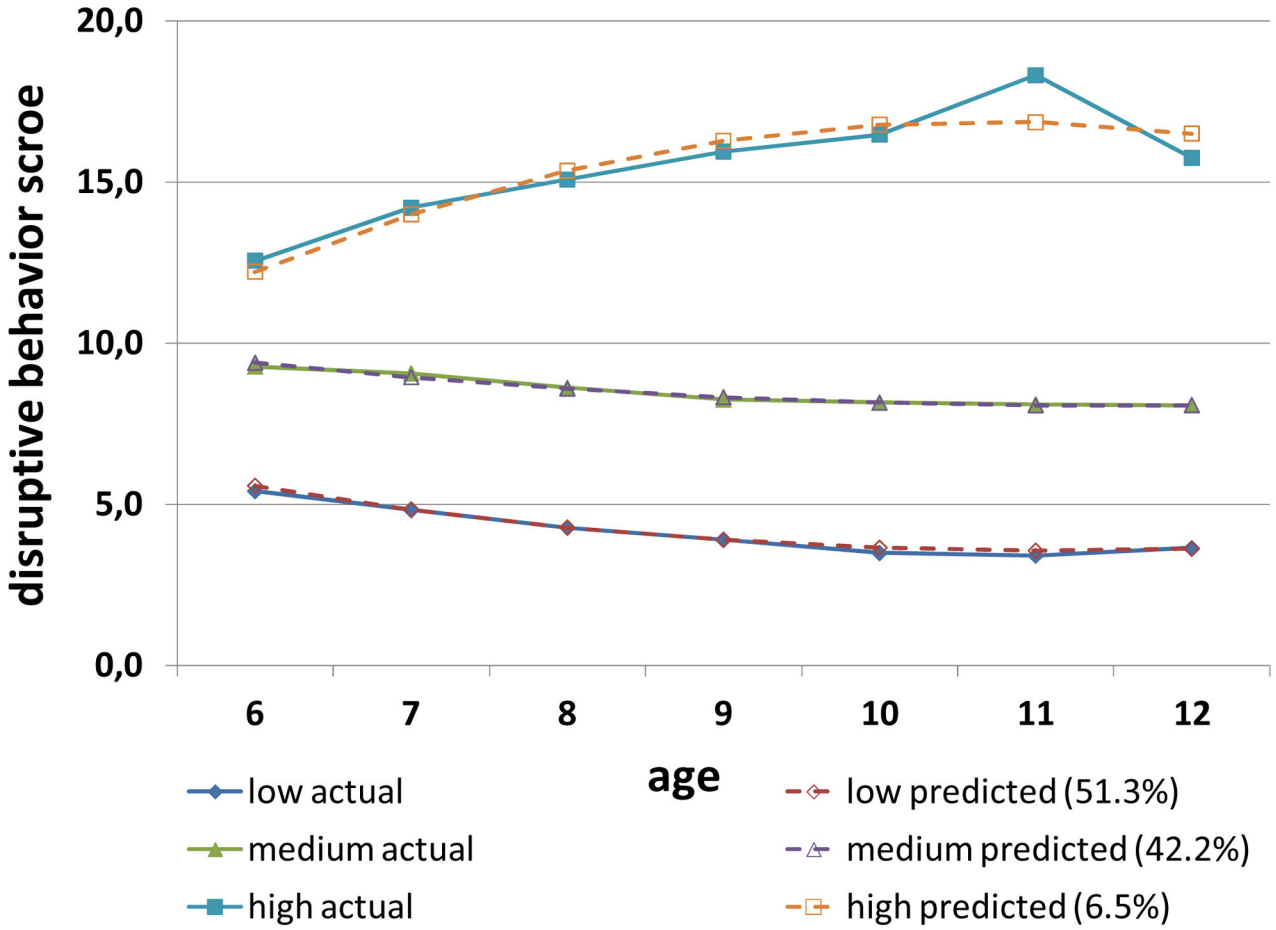

Figure 2.
Girls' Disruptive Behavior Trajectories in Childhood
Note individuals were assigned to the group of highest probability to compute prevalence

Table 1

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

	Trajectory Groups			Comparison Trajectory Groups					
	Low (N= 955)	Medium (N= 786)	High (N= 122)	Low vs Medium		Low vs High		Medium vs High	
	%	%	%	OR	95% CI	OR	95% CI	OR	95% CI
Internalizing problems									
Depression	8.2	13.3	14.8	1.7**	(1.3, 2.4)	2.0*	(1.1, 3.4)	1.1	(0.7, 2.0)
Self-harm	3.2	5.6	12.2	1.8*	(1.1, 2.9)	4.2***	(2.1, 8.2)	2.3**	(1.2, 4.4)
PTSD	1.5	1.4	5.2	0.9	(0.4, 2.1)	3.6*	(1.4, 9.7)	4.0**	(1.4, 11.1)
Substance use									
Nicotine use	6.0	10.2	10.4	1.8**	(1.2, 2.6)	1.8	(0.9, 3.5)	1.0	(0.5, 2.0)
Illegal substance use	22.6	29.5	34.8	1.4**	(1.1, 1.8)	1.8**	(1.2, 2.8)	1.3	(0.8, 1.9)
Other									
Interpersonal aggression	15.3	20.9	35.7	1.5**	(1.1, 1.9)	3.1***	(2.0, 4.7)	2.1***	(1.4, 3.2)
Early sexual behavior	7.7	12.6	22.6	1.7**	(1.2, 2.5)	3.5***	(2.1, 5.0)	2.0**	(1.2, 3.4)
Risky sexual behavior	7.4	10.2	18.7	1.4	(1.0, 2.0)	2.9***	(1.7, 5.0)	2.0*	(1.2, 3.5)
Peer delinquency	23.4	26.5	31.3	1.2	(0.9, 1.5)	1.5	(1.0, 2.3)	1.3	(0.8, 1.9)
Low academic achievement	20.1	29.1	44.0	1.6***	(1.3, 2.1)	3.1***	(2.1, 4.7)	1.9**	(1.3, 2.9)
	M (SD)	M (SD)	M (SD)	Likelihood Ratio χ^2 (df=2)				Post Hoc Comparison	
Total adjustment problems	1.14 (1.42)	1.56 (1.73)	2.23 (2.08)	43.75***				Low < Medium < High	

*$p < .05$,

**$p < .01$,

***$p < .001$