Published in final edited form as:

Child Indic Res. 2012 December ; 5(4): . doi:10.1007/s12187-012-9135-9.

Delinquency Among Adolescents with Disabilities

Carrie L. Shandra and

Department of Sociology, Hofstra University, Hempstead, NY 11549, USA

Dennis P. Hogan

Department of Sociology/Population Studies and Training Center, Brown University, Providence, RI 02912, USA

Carrie L. Shandra: Carrie.Shandra@Hofstra.edu; Dennis P. Hogan: Dennis_Hogan@Brown.edu

Abstract

This study expands upon previous research by utilizing nationally representative data and multivariate analyses to examine the relationship between an adolescent's disability status and their likelihood of engaging in a spectrum of delinquent behaviors through age 16. Logistic regression models of 7,232 adolescents from the National Longitudinal Survey of Youth 1997 are used to investigate the association between the presence of a learning disability or emotional condition, chronic health condition, sensory condition, physical disability, or multiple conditions and ten delinquent acts, including violence-related delinquency, property crimes, drug offenses, and arrest. Additional analyses explore differences in delinquency prevalence by more specific types of limiting conditions. Results indicate that adolescents with learning disabilities or emotional conditions are particularly at risk of committing delinquent acts. Findings suggest that disability status is important to consider when examining adolescent delinquency; however, not all youth with disabilities have equal experiences.

Keywords

Disability; Health conditions; Delinquency; Adolescence; Transition to adulthood

1 Introduction

Existing research suggests young people with disabilities are more likely than young people without disabilities to engage in delinquent behavior (e.g. Pickar and Tori 1986; Larson 1988; Brier 1989; Morris and Morris 2006; McNamara and Willoughby 2010; Oshima et al. 2010). Moreover, they are also disproportionately represented in correctional institutions and juvenile detention facilities (see Morris and Morris 2006 for a review). This evidence helps to address what the National Council on Disability (Mears and Aron 2003, p. iii) calls, "...a tremendous gap in empirically based knowledge about children and youth with disabilities, especially those who are either at risk of delinquency or involved in the juvenile justice system".

However, several limitations of this work preclude our understanding of the disability-delinquency relationship in the United States at the population level (see the section below for a review). Many studies rely on regional data to examine the relationship between disability and delinquency, limiting the generalizability of results. Others fail to control for

family structures, poverty status, and the education of parents—confounding factors that may account for the apparent effects of disability on delinquency. In addition, many prior studies have lacked data collected longitudinally to assess the effects of disability at one point in time on delinquency at a later point in the life course of youth. Finally, less is known about how the likelihood of engaging in various *types* of delinquent behaviors may be related to different *types* of disability. Speaking specifically about young persons with learning disabilities (LD), Perlmutter (1987, p. 92) suggests, “The assumption that delinquency among the LD population occurs along a continuum, with an absence of delinquent behavior at one end and frequent delinquent behavior at the other, may not be correct.” The distinction between types of delinquency is an important one, as seriousness of offense during adolescence is predictive of later offending during adulthood (Kempf 1998; Lipsey and Derzon 1998). Furthermore, participation in one type of delinquency may increase the likelihood of engaging in another type of delinquency (Le Blanc and Loeber 1998).

This study expands upon previous research by utilizing nationally representative data and multiple indicators of disability to examine the relationship between an adolescent’s disability status and their likelihood of engaging in a spectrum of delinquent behaviors through age 16. More specifically, we consider the association between the limiting conditions of learning or emotional conditions, chronic health conditions (including *asthma*, *heart conditions*, or *other chronic conditions*), physical disabilities (including *congenital disabilities*), sensory conditions (including *blindness*, *vision difficulties*, *hearing difficulties*, *speech difficulties*, or *other sensory conditions*), or multiple conditions (including those with and without learning disabilities or emotional conditions) and violence-related delinquency, property crimes, drug offenses, and arrest than youth without disabilities. This article contributes to the literatures on the transition to adulthood and adolescent delinquency by examining the variation in both types of disability and types of delinquent acts.

2 Variation in Delinquent Behaviors by Condition Type

2.1 Empirical Evidence

Much of the nationally representative evidence on the relationship between disabilities and delinquency comes from the National Longitudinal Study of Adolescent Health (Add Health [Harris 2009]), a school-based survey that asks about frequency of delinquent acts in the 12 months preceding each interview. Using this data, Meadows (2007) includes learning disability and physical disability as part of a composite measure of stressful events on minor offenses, major offenses, and depression. Duncan et al. (2001) include physical disabilities as a control variable without a reported coefficient in modeling a delinquency index.

Several studies use physical disability as an “unappealing physical characteristic” (Chen and Adams 2010, p. 448) or an “individual characteristic associated with stigma” (Kreager 2004, p. 364) to find that these adolescents are no less likely than those without physical disabilities to abstain from delinquency, participate in gang initiation, or engage in property crime. This research conceptualizes disability as a proxy or control for social or individual burden, instead of a set of conditions that may uniquely affect a young person’s likelihood of engaging in delinquent behaviors.

Using the same data, Bartlett et al. (2006) find that adolescents with learning disabilities were at risk of the deviant behavior problems of selling drugs, weapon use, and having sex while under the influence of substances. Svetaz et al. (2000) indicate that youth with learning disabilities are significantly more likely than youth without learning disabilities to report carrying a weapon and involvement in violent behavior. Other work (Jones and Lollar 2008) uses a combined measure of physical disability and long-term health problems among

youth in the Youth Risk Behavior Survey to find that adolescents with these conditions are more likely than those without these conditions to report being in a physical fight. In sum, much of what is known about the disability-delinquency relationship using national data focuses on singular types of limitations and delinquent behaviors—despite evidence that both involve substantial variation.

Regional data provide more (although sometimes conflicting) evidence on differences between delinquency and varying types of conditions. Malmgren et al. (1999) use longitudinal data from Seattle to find no relationship between having a learning disability in fifth grade and number of arrests or participation in violent or nonviolent delinquent activity in the year before interview in twelfth grade. Adolescents with Cystic Fibrosis or Sickle Cell Disease in North Carolina were less likely than those without these conditions to report carrying a weapon (Britto et al. 1998). Similarly, Jacobson et al. (1997) report that adolescents with diabetes were less likely than those without to report buying or selling stolen goods, carrying a concealed weapon, breaking into a building or car, or selling drugs. Others (Barwick and Siegel 1996) suggest that adolescents with learning disabilities are disproportionately represented among runaways, and Sullivan and Knutson's (2000) analysis of data from a large Midwestern city found that youth with behavioral disorders, mental retardation, and learning disabilities were more likely to run away than youth with other types of disabilities.

Other studies examine differences in disability status among adolescents who have already been arrested. A study (Bullis and Yavanoff 2005) of incarcerated youth from Oregon's juvenile justice system indicates that youth with special education disabilities were more likely than youth without these disabilities to have been committed to the juvenile correctional system for a person-related—as compared to a property-related—crime. Denkowski and Denkowski (1986) find that theft is the most common offense among arrested adolescents with developmental disabilities—followed by burglary and assault. Data from the Virginia Department of Education (1996; cited in Defur 1997) indicates that incarcerated youth with disabilities are more likely than incarcerated youth without disabilities to report involvement in gang activity.

In sum, while none of the evidence is entirely consistent, most of this research suggests that adolescents with learning disabilities are at increased risk of engaging in a spectrum of delinquent behaviors. Those with chronic illness and physical disabilities are typically no different or are less likely than those without disabilities to report delinquency. This paper moves beyond existing research—and aims to address some of these discrepancies in results—by examining how multiple types of health conditions and disabilities are associated with specific delinquent behaviors.

2.2 This Study

The current analysis is the first to use nationally-representative, population-based data to examine the relationship between a youth's likelihood of reporting a spectrum of ten delinquent behaviors and four domains of disabling conditions, including the presence of learning, chronic, physical, sensory, or multiple conditions. In doing so, we also control for the potentially confounding influences of other youth and household characteristics. Additional bivariate analyses explore differences in delinquency among ten more specific condition categories (learning disability or attention deficit, emotional/mental or behavior problem, asthma, heart condition, other chronic condition, blindness, other vision difficulty, hearing difficulty, speech impairment, other sensory condition). Furthermore, we improve upon previous nationally representative research by accounting for the temporal ordering of age at disability onset versus age of first delinquent act.

3 Data and Methods

3.1 Data Source

The National Longitudinal Survey of Youth 1997 (NLSY97) is a nationally representative household-based sample of the non-institutional population of young persons in the United States (Bureau of Labor Statistics and U.S. Department of Labor 2006). This is a longitudinal survey that annually collects data on an age cohort of children who were ages 12 to 16 as of December 31, 1996. Information for this analysis is utilized from the first five waves of data, at which time all adolescents have reached the age of 16 at last interview. The data file is created such that each respondent has one set of observations corresponding to their involvement in delinquent activity through age 16.

The original NLSY97 sample includes 8,984 total adolescents; 7,942 of whom have parental interviews and thus were eligible for health limitation questions. The sample eligibility for this analysis includes all adolescents in the NLSY97 with valid responses on all dependent measures and the disability measures ($N=7,604$). Less than two percent of this sample was excluded due to missing information on any independent variable. Additionally, in order to ensure appropriate temporal ordering such that disability onset occurred *before* delinquency onset, another three percent were excluded if the age when their first disabling condition was noticed occurred after the age when they reported their first delinquent act.¹ The final sample for this analysis includes 7,232 adolescents.

3.2 Variables

3.2.1 Disabilities—Descriptions of all variables can be found in Table 1. Disability measures are constructed from four domains from which parents reported youth activity limitations in the NLSY97 in 1997. In total, six dichotomous and mutually exclusive variables are created to indicate if a youth has ever had a learning disability or emotional condition only (4.8% of the sample), chronic health condition only (6.8%), physical disability only (0.6%), or sensory condition only (11%)—along with a two measures representing youth with conditions in multiple domains. Almost 4% of youth have multiple conditions that include a learning disability or emotional condition, with an additional 2% reporting multiple conditions that do not include a learning disability or emotional condition.²

3.2.2 Delinquency—All youth were asked to self-report their participation in ten activities in wave 1 of the NLSY97—including running away from home, handgun use, gang involvement, theft, violence, drug sales, property destruction, and arrests (the full definition of each item can be found in Table 1). Our focus is on participation in delinquent activities during the early- and mid-teenage years, when most youth are not yet residentially independent and are less likely to be charged as an adult for delinquent crimes. Therefore, we recreate each delinquency item to indicate if a youth has participated in each of the ten activities before—or during—the age of 16. We do this by combining information collected in 1997 on whether or not a youth has *ever* participated in each activity with information from each subsequent interview on whether or not they have participated in each activity

¹Adolescents who reported committing any of items in the delinquency index were asked to report the age in which they first committed this behavior for every item except stealing something less than \$50. Parents who reported any limiting condition for their children were also asked, “How old was [this youth] when the [limiting condition] was first noticed?”. As it is impossible to determine if – among the excluded sample of adolescents where first disability was noticed *after* first delinquent act – disability onset occurred earlier but was unnoticed by the parent *or* if delinquent behavior caused a limiting condition, we choose the more conservative approach of excluding these adolescents from the analysis entirely.

²Parents who reported a learning or emotional condition were also asked if their child had “mental retardation” or “an eating disorder like anorexia or bulimia”. Due to the small number of youth in each of these categories (less than 5 cases each in the final sample) and the different limitations associated with these conditions, we exclude these youth from the analysis.

since the date of last interview up through their age 16 interview.³ The most frequently reported delinquent behavior is stealing less than \$50 (38%), followed by destruction of property (32.1%), attacking someone (25.2%), running away from home (15.5%), and carrying a hand gun (13.3%). The least frequently reported delinquent behavior is gang membership (10.1%), followed by stealing more than \$50 (10.8%), other property crimes (11.2%), selling drugs (11.3%), and arrest (12.9%).

3.2.3 Youth Characteristics—Aside from an adolescent's disability status, models also control for 1997 dichotomous reports of sex and race/ethnicity (as reported by the household informant in the original screening interview) as non-Hispanic Black or Hispanic. Males comprise 50.7% of the full sample. Twenty percent of youth are Hispanic, and 26% are non-Hispanic Black.

3.2.4 Household Characteristics—Many of the adolescent's household characteristics are not asked retrospectively in the NLSY97, therefore it is not possible to precisely determine household poverty or complete household rosters for most years during early childhood. Several measures are available, however, which allow for a snapshot of the child's household before most of the adolescents have begun engaging in delinquent behaviors. As family income is only available in 1997, participation in a Head Start program is intended as a proxy to indicate adolescents who experienced lower socioeconomic status during early childhood. Twenty percent of the overall sample was categorized as participating in Head Start.

Family status at age 6 is captured by two dummy variables that contrast adolescents who live with both biological parents (46.3% of the overall sample) and adolescents who live with one biological and one step parent (13.8% of the overall sample) with all other arrangements. Parental highest education is measured by two dichotomous measures that indicate a youth's biological parents' highest year of education (when both parents are present we use the higher of the two parents) as a high school or college degree—versus the reference category of less than a high school degree. Fifty-eight percent of youth have parents with a high school degree as their highest degree and 26% have a parent with a college degree.

4 Methods

Binary logistic regression equations are used to examine all dichotomous delinquency outcomes, with odds ratios reported in the results. A unit increase in the predictor can be interpreted as the expected change in the odds of observing the outcome variable, holding all other variables in the model constant. See Allison (1999a) for additional explanation of this technique. Regression diagnostics were examined for all equations. All variance inflation factors were below 2.5, suggesting multicollinearity is not a problem (Allison 1999b). Tests for influential cases all fell below a value of 1 (Tabachnick and Fidell 2007), therefore all cases are retained.

³Two variables measuring age in months as of the first and last used interview are included to control for variation in exposure time. The age 17 interview is used for respondents who are not interviewed during age 16. Alternative coding schemes for the exposure variables and the dependent variables are examined to explore the robustness of the relationship between disability and delinquent activity. Results are highly comparable across schemes.

5 Results

5.1 Multivariate Results

Table 2 presents binary logistic regression models of running away, stealing, and property crimes on disability, youth characteristics, and household characteristics. Having a learning disability or emotional condition—both by themselves and in conjunction with other conditions—is positively associated with running away and stealing more than \$50. Adolescents with multiple conditions including learning or emotional conditions are also more likely to engage in destruction of property. Physical disability is the only other condition that is positively related to any of the delinquent acts presented in Table 2; the odds of stealing less than \$50 are 85% higher for adolescents with physical disabilities than for those without disabilities. Conversely, there is a negative relationship between having a chronic condition or a sensory condition and the destruction of property. There is no significant association between having any of the conditions examined here and engaging in other types of property crimes, net of youth and household characteristics.

Table 3 presents binary logistic regression models of carrying a hand gun, gang membership, attack, selling drugs, and arrest. Again, having a learning disability or emotional condition—either as a singular type of condition or with other condition types—is positively associated with carrying a handgun, gang membership, attack, and arrest. Adolescents with other types of multiple conditions are also more likely to report gang membership. There is no significant relationship between having a limiting condition and selling drugs.

An examination of youth and household characteristics reveals that being male has a positive and significant association with all outcomes except running away, where it has a negative association. Being non-Hispanic Black is positively associated with gang membership and attack and negatively associated with all other outcomes except stealing more than \$50. Among the household characteristics, results suggest that adolescents who had lower socioeconomic status in childhood (as indicated by their participation in Head Start) are more likely to run away, become gang members, attack to hurt, sell drugs, and be arrested. Living with both biological parents plays a protective role in decreasing the likelihood of engaging in all forms of delinquent behaviors. Having a parent with a college degree is negatively related to running away, stealing more than \$50, carrying a handgun, gang membership, attack, and arrest.

5.2 Percentage of Adolescents with Specific Conditions Who Engage in Delinquent Behaviors

NLSY97 also includes information on more specific types of limiting conditions within the domains presented in the multivariate models. The small number of adolescents with each type of specific condition limits the statistical power we have to include these categories in multivariate models or perform hypothesis tests. However, we can explore differences in the percentage of adolescents with each type of condition that engage in each type of delinquent behavior. Results are presented in Table 4. Again, conditions are mutually exclusive in order to avoid the confounding effect of having multiple types of limitations.

Comparisons focus on differences within each category. Within the learning disabilities or emotional conditions category, a higher percentage of adolescents with emotional conditions only versus learning disabilities or attention disorders only report running away from home (13.6% more), destruction of property (13.7% more), or arrest (7.9% more); there is a less sizeable difference among all other outcomes. Interesting differences also emerge among adolescents with specific types of chronic conditions. Within the chronic conditions category, 29% of adolescents with heart conditions report running away—over 15% more

than those with asthma or those who fall into the “other” category. A sizeable difference can also be found in the destruction of property outcome, with 23.3% more adolescents with heart conditions than adolescents with asthma reporting this behavior. Perhaps the most intriguing finding emerges when comparing the specific conditions in the sensory limitation category. While adolescents who have blindness in one or both eyes have the lowest percentage of reporting all delinquent activities, they are the most likely to report being arrested (28.6%). Aside from those in the “other sensory condition” category, adolescents with speech impairments were also disproportionately likely to have carried a handgun (20%), stole less than \$50 (42.7%), committed other property crimes (17.3%), and attacked or hurt (34.7%).

6 Discussion and Conclusions

Exiting literature suggests that adolescents with disabilities—particularly those with learning disabilities—are more likely to engage in delinquent behaviors and juvenile offending than adolescents without disabilities (e.g. McNamara and Willoughby 2010; Oshima et al. 2010). Despite this evidence and the National Council on Disability’s policy interest in understanding youth with disabilities who are at risk of delinquency (Mears and Aron 2003), the relationship between various types of adolescent disability and delinquency remains under-researched. The current analysis is the first to use nationally-representative, population-based data to examine the relationship between a youth’s likelihood of reporting a spectrum of ten delinquent behaviors and their disability status. Using multiple indicators of disability, and controlling for the potentially confounding effects of youth and household characteristics, we find consistent evidence that the likelihood of engaging in most delinquent behaviors is not equal for adolescents with and without disabilities. Furthermore, it is not equal across types of limiting conditions.

A clear pattern emerges when examining the results across types of conditions. Youth with learning disabilities or emotional conditions only are at the highest risk of engaging in delinquency, as the multivariate models demonstrate a positive and significant relationship between these conditions and six of the outcomes examined here. A similar pattern emerges among youth with learning or emotional conditions who also have limitations in other domains. With two exceptions—between those with physical disability and petty theft and between those with multiple conditions that do not include learning or emotional conditions and gang membership—adolescents with other types of conditions are no more likely to engage in delinquency than adolescents without disabilities. Those with chronic or sensory conditions are *less likely* to engage in destruction of property.

It is interesting to note that none of the conditions examined are associated with selling drugs or other property crime, net of youth and household characteristics. As the latter entails “fencing, receiving, possessing or selling stolen property, or cheat [ing] someone by selling them something that was worthless or worth much less than what you said it was”, both of these are activities that require more social negotiation. Qualitative research would be well-suited for examining factors that influence why adolescents with disabilities engage in—or avoid—delinquent acts that call for different types of skills.

Table 4 also suggests interesting avenues for future research. We find variation in the likelihood that youth with specific types of learning or emotional, sensory, or chronic health conditions will engage in each type of delinquent act. For example, with only two exceptions, those with emotional/mental or behavior problems are more likely to engage in delinquency than those with learning disabilities. Taken together, our results suggest that research on contributors to adolescent delinquency should also consider the presence of disabilities—particularly learning disability and emotional or behavioral conditions.

A limitation of this study is our inability to explore the mechanisms that link disability and delinquency. For example, previous research suggests that economic and parental resources (Hirschi 1969; Sampson and Laub 1994), exposure to delinquent or prosocial peers (Moffitt 1997; Piquero et al. 2005), and school engagement (Piquero et al. 2005; Thaxton and Agnew 2004; Maguin and Loeber 1996) are associated with the likelihood of engaging in delinquent acts. However—compared with adolescents without disabilities—adolescents with disabilities are more likely to grow up in households that are in poverty (Fujiura and Yamaki 2000; Parish et al. 2008), may have greater difficulty developing positive social interactions with their age peers (Guralnick and Groom 1987; Bullis et al. 1993; Guralnick et al. 1996; McConnell and Odom 1999; Coster and Haltiwanger 2004), and often have lower school achievement and teacher attachment (Blackorby et al. 2010; Needham et al. 2004). Unfortunately, neither the NLSY97—nor any other nationally representative survey that we are aware of in the United States—contains time-varying information on disability, delinquency, and the potentially mediating factors of familial resources, peer influence, and school engagement.⁴

Although we are not able to appropriately explore these mechanisms using the NLSY97, results provide a clear indication of the immediacy of promoting positive transitions to adulthood for youth with disabilities—especially those with learning or emotional conditions. Adolescents with certain types of disabilities are at greater risk of committing delinquent acts than adolescents without disabilities. These adolescents are also at risk of lower school performance and poorer family and peer relationships (McConnell and Odom 1999; Coster and Haltiwanger 2004; Hogan et al. 2007; Blackorby et al. 2010). Therefore, intervention programs that take a multi-systems approach such that positive family, school, and community interaction accumulate to buffer against delinquency (Zigler et al. 1992; Yoshikawa 1994; Eddy et al. 2000) may be most effective.

Our results also indicate that youth with disabilities are more likely than those without disabilities to be arrested. In their report for the National Council on Disability, Mears and Aron (2003, p. 42–43) suggest in their review of disability-related services in the juvenile justice system,

Perhaps the most unifying theme underlying many of the studies reviewed for this report and the comments from respondents is the longstanding and continuing absence of a comprehensive continuum of disability-related services within the juvenile justice system...Despite significant attention to the issue in recent years, reviews suggest that the prospects are dim that significant changes in disability-related programs and services will change in coming years.

Prior research indicates that a substantial number of teenagers with disabilities leave high school and neither work nor continue their education (Blackorby and Wagner 1996; Wells et al. 2003), despite the majority having goals to the contrary (Cameto et al. 2004). As youth in the juvenile justice system also face a host of challenges to successfully transition to adulthood (Chung et al. 2005), adolescents with disabilities and a juvenile record are likely to be doubly disadvantaged.

⁴As previously discussed, NLSY97 allows us to distinguish the age when the youth first committed most delinquent acts and the age when their parent first noticed each limiting condition. However, data on these potentially mediating protective factors is more sporadic. For example, information about teacher attachment and involvement with delinquent or prosocial peers (Piquero et al. 2005) refers to the adolescent's experience at the time of first interview, when the respondents range in age from 12 to 16. Questions about parental monitoring and the perceived quality of the parent-youth relationship follow a similar scheme. As many respondents report that their first delinquent acts occurred before the first interview, and prior literature indicates that adolescents who have committed delinquent acts also have lower school performance, more delinquent friends, and less positive parental dynamics (Kaplan et al. 1987; Thornberry et al. 1991; Elliott and Menard 1992; Jang and Smith 1997), we do not feel it is appropriate to include these indicators in our analysis of delinquency through age 16.

Acknowledgments

This research was supported by Grant # 5 U01 HD37614 from the National Institute of Child Health and Human Development.

References

- Allison, PD. Logistic regression using the SAS System: Theory and application. Cary: SAS; 1999a.
- Allison, PD. Multiple regression: A primer. Thousand Oaks: Pine Forge; 1999b.
- Bartlett R, Holditch-Davis D, Belyea M, Halpern CT, Beeber L. Risk and protection in the development of problem behaviors in adolescents. *Research in Nursing & Health*. 2006; 29:607–621. [PubMed: 17131284]
- Barwick MA, Siegel LS. Learning difficulties in adolescent clients of a shelter for runaway and homeless street youths. *Journal of Research on Adolescence*. 1996; 6:649–670.
- Blackorby J, Wagner M. Longitudinal postschool outcomes of youth with disabilities: findings from the National Longitudinal Transition Study. *Exceptional Children*. 1996; 62:399–413.
- Blackorby, J.; Schiller, E.; Mallik, S.; Hebbeler, K.; Huang, T.; Javitz, H., et al. Patterns in the identification of and outcomes for children and youth with disabilities. Washington, D.C.: U.S. Department of Education; 2010. edited by
- Brier N. The relationship between learning disability and delinquency. *Journal of Learning Disabilities*. 1989; 22:546–553. [PubMed: 2681487]
- Britto MT, Garrett JM, Dugliss MAJ, Daeschner CW, Johnson CA, Leigh MW, et al. Risky behavior in teens with Cystic Fibrosis or Sickle Cell Disease: a multicenter study. *Pediatrics*. 1998; 101:250–256. [PubMed: 9445499]
- Bullis M, Yavanoff P. More alike than different? Comparison of formerly incarcerated youth with and without disabilities. *Journal of Child and Family Studies*. 2005; 14:127–139.
- Bullis M, Evans VN, Fredericks HDB, Davis C. Identifying and assessing the job-related social skills of adolescents and young adults with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*. 1993; 1:236–250.
- Bureau of Labor Statistics, U.S. Department of Labor. Produced by the National Opinion Research Center, the University of Chicago and distributed by the Center for Human Resource Research. The Ohio State University; 2006. National Longitudinal Survey of Youth 1997 cohort, 1997–2007 [computer file].
- Cameto, R.; Levine, P.; Wagner, M. Transition planning for students with disabilities: A special topic report of findings from the National Transition Study-2 (NLTS-2). Menlo Park: SRI; 2004.
- Chen X, Adams M. Are teen delinquency absters social introverts?: A test of Moffitt's theory. *Journal of Research in Crime and Delinquency*. 2010; 47:439–468.
- Chung, HL.; Little, M.; Steinberg, L. The transition to adulthood for adolescents in the juvenile justice system: a developmental perspective. In: Osgood, DW.; Foster, EM.; Flanagan, C.; Ruth, G., editors. *On your own without a net: The transitions to adulthood for vulnerable populations*. Chicago: University of Chicago Press; 2005. p. 68-91.
- Coster WJ, Haltiwanger JT. Social—behavioral skills of elementary students with physical disabilities included in general education classrooms. *Remedial and Special Education*. 2004; 25:95–103.
- Defur SH. Collaboration as a prevention tool for youth with disabilities. *Preventing School Failure*. 1997; 41:173–178.
- Denkowski GC, Denkowski KM. Characteristics of the mentally retarded adolescent offender and their implications for residential treatment design. *Behavioral Residential Treatment*. 1986; 1:73–90.
- Duncan GJ, Boisjoly J, Harris KM. Sibling, neighbor, and schoolmate correlations as indicators of the importance of context for adolescent development. *Demography*. 2001; 38:437–447. [PubMed: 11523270]
- Eddy JM, Reid JB, Fetrow RA. An elementary school-based prevention program targeting modifiable antecedents of youth delinquency and violence: linking the interests of families and teachers (LIFT). *Journal of Emotional and Behavioral Disorders*. 2000; 8:165–176.

- Elliott, DS.; Menard, S. Delinquent friends and delinquent behavior: temporal and developmental patterns. In: Hawkins, JD., editor. Some current theories of crime and deviance. New York: Springer; 1992. p. 28-67.
- Fujiura GT, Yamaki K. Trends in demography of childhood poverty and disability. *Exceptional Children*. 2000; 66:187-199.
- Guralnick MJ, Groom JM. The peer relations of mildly delayed and nonhandicapped preschool children in mainstreamed playgroups. *Child Development*. 1987; 58:1556-1572. [PubMed: 3691202]
- Guralnick MJ, Connor RT, Hammond MA, Gottman JM, Kinnish K. The peer relations of preschool children with communication disorders. *Child Development*. 1996; 67:471-489. [PubMed: 8625723]
- Harris, KM. The national longitudinal study of adolescent health (Add Health), waves I & II, 1994-1996; Wave III, 2001-2002; Wave IV, 2007-2009 [machine-readable data file and documentation]. Chapel Hill: Carolina Population Center, University of North Carolina at Chapel Hill; 2009.
- Hirschi, T. Causes of delinquency. Berkeley: University of California Press; 1969.
- Hogan DP, Shandra CL, Msall ME. Family developmental risk factors among adolescents with disabilities and children of parents with disabilities. *Journal of Adolescence*. 2007; 30:1001-1019. [PubMed: 17445879]
- Jacobson AM, Hauser ST, Willett JB, Wolfsdorf JI, Dvorak R, Herman L, et al. Psychological adjustment to IDDM: 10-year follow-up of an onset cohort of child and adolescent patients. *Diabetes Care*. 1997; 20:811-818. [PubMed: 9135947]
- Jang SJ, Smith CA. A test of reciprocal causal relationships among parental supervision, affective ties, and delinquency. *Journal of Research in Crime and Delinquency*. 1997; 34(3):307-336.
- Jones SE, Lollar DJ. Relationship between physical disabilities or long-term health problems and health risk behaviors or conditions among US high school students. *Journal of School Health*. 2008; 78:252-257. [PubMed: 18387024]
- Kaplan HB, Johnson RT, Bailey CA. Deviant peers and deviant behavior: further elaboration of a model. *Social Psychology Quarterly*. 1987; 50:277-284.
- Kempf KL. Crime severity and criminal career progression. *The Journal of Criminal Law & Criminology*. 1998; 79:524-540.
- Kreager D. Strangers in the halls: isolation and delinquency in school networks. *Social Forces*. 2004; 83:351-390.
- Larson KA. A research review and alternative hypothesis explaining the link between learning disability and delinquency. *Journal of Learning Disabilities*. 1988; 21:357-363. [PubMed: 3047295]
- Le Blanc M, Loeber R. Developmental criminology updated. *Crime and Justice*. 1998; 23:115-198.
- Lipsey, MW.; Derzon, HD. Predictors of violent or serious delinquency in adolescence and early adulthood: a synthesis of longitudinal research. In: Loeber, R.; Farrington, DP., editors. *Serious and violent juvenile offenders: Risk factors and successful interventions*. Thousand Oaks: Sage; 1998. p. 86-105.
- Maguin E, Loeber R. Academic performance and delinquency. *Crime and Justice*. 1996; 20:145-264.
- Malmgren K, Abbott RD, Hawkins JD. LD and delinquency. *Journal of Learning Disabilities*. 1999; 32:194-200. [PubMed: 15508239]
- McConnell SR, Odom SL. A multimeasure performance-based assessment of social competence in young children with disabilities. *Topics in Early Childhood Special Education*. 1999; 19:67-74.
- McNamara JK, Willoughby T. A longitudinal study of risk-taking behavior in adolescents with learning disabilities. *Learning Disabilities Research & Practice*. 2010; 25:11-24.
- Meadows SO. Evidence of parallel pathways: gender similarity in the impact of social support on adolescent depression and delinquency. *Social Forces*. 2007; 85:1143-1167.
- Mears, DP.; Aron, LY. Addressing the needs of youth with disabilities in the juvenile justice system: The current state of knowledge. Washington: National Council on Disability; 2003.

- Moffitt, TE. Adolescence-limited and life-course persistent offending: a complementary pair of developmental theories. In: Thornberry, TP., editor. *Developmental theories of crime and delinquency*. Piscataway: Transaction; 1997. p. 11-54.
- Morris KA, Morris RJ. Disability and juvenile delinquency: issues and trends. *Disability & Society*. 2006; 21:613–627.
- Needham BL, Crosnoe R, Muller C. Academic failure in secondary school: the inter-related role of health problems and educational context. *Social Problems*. 2004; 51:569–586. [PubMed: 20354573]
- Oshima KMM, Huang J, Jonson-Reid M, Drake B. Children with disabilities in poor households: association with juvenile and adult offending. *Social Work Research*. 2010; 34:102–113. [PubMed: 23378718]
- Parish SL, Rose RA, Grinstein-Weiss M, Richman EL, Andrews ME. Material hardship in U.S. families raising children with disabilities. *Exceptional Children*. 2008; 75:71–92.
- Perlmutter B. Delinquency and learning disabilities: evidence for compensatory behaviors and adaptation. *Journal of Youth and Adolescence*. 1987; 16:89–95.
- Pickar D, Tori C. The learning disabled adolescent: Eriksonian psychosocial development, self-concept, and delinquent behavior. *Journal of Youth and Adolescence*. 1986; 15:429–440.
- Piquero AR, Brezina T, Turner MG. Testing Moffitt's account of delinquency abstention. *Journal of Research in Crime and Delinquency*. 2005; 42:27–54.
- Sampson RJ, Laub JH. Urban poverty and the family context of delinquency: a new look at structure and process in a classic study. *Child Development*. 1994; 65:523–540. [PubMed: 8013238]
- Sullivan PM, Knutson JF. The prevalence of disabilities and maltreatment among runaway children. *Child Abuse & Neglect*. 2000; 24:1275–1288. [PubMed: 11075695]
- Svetaz MV, Ireland M, Blum R. Adolescents with learning disabilities: risk and protective factors associated with emotional well-being: findings from the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health*. 2000; 27:340–348. [PubMed: 11044706]
- Tabachnick, BG.; Fidell, LS. *Using multivariate statistics*. 5th ed.. Boston: Pearson; 2007.
- Thaxton S, Agnew R. The nonlinear effects of parental and teacher attachment on delinquency: disentangling strain from social control explanations. *Justice Quarterly*. 2004; 21:763–791.
- Thornberry TP, Lizotte AJ, Krohn MD, Farnworth M, Jang SJ. Testing interactional theory: an examination of reciprocal causal relationships among family, school, and delinquency. *The Journal of Criminal Law and Criminology*. 1991; 82:3–35.
- Virginia Department of Education. Unpublished data. 1996
- Wells T, Sandefur GD, Hogan DP. What happens after the high school years among young persons with disabilities? *Social Forces*. 2003; 82:803–832.
- Yoshikawa K. Prevention as cumulative protection: effects of early familial support and education on chronic delinquency and its risks. *Psychological Bulletin*. 1994; 115:28–54. [PubMed: 8310099]
- Zigler E, Taussig C, Black K. Early childhood intervention: a promising preventative for juvenile delinquency. *American Psychologist*. 1992; 47:997–1006. [PubMed: 1510335]

Table 1

Descriptive statistics

	Variable description	Proportion and standard deviation
<i>Dependent measures</i>		
Ran away from home	"Have you ever run away, that is, left home and stayed away at least overnight without your parent's prior knowledge or permission?"	0.155 (0.362)
Carried a handgun	"Have you ever carried a hand gun? When we say hand gun, we mean any firearm other than a rifle or shotgun."	0.133 (0.340)
Gang membership	"Have you ever belonged to a gang?"	0.101 (0.301)
Stole less than \$50	"Have you ever stolen something from a store or something that did not belong to you worth less than 50 dollars?"	0.380 (0.486)
Stole more than \$50	"Have you ever stolen something from a store, person or house, or something that did not belong to you worth 50 dollars or more including stealing a car?"	0.108 (0.311)
Destruction of property	"Have you ever purposely damaged or destroyed property that did not belong to you?"	0.321 (0.467)
Other property crime	"Have you ever committed other property crimes such as fencing, receiving, possessing or selling stolen property, or cheated someone by selling them something that was worthless or worth much less than what you said it was?"	0.112 (0.316)
Attacked	"Have you ever attacked someone with the idea of seriously hurting them or have a situation end up in a serious fight or assault of some kind?"	0.252 (0.434)
Sold drugs	"Have you ever sold or helped sell marijuana (pot, grass), hashish (hash) or other hard drugs such as heroin, cocaine or LSD?"	0.113 (0.317)
Arrested	"Have you ever been arrested by the police or taken into custody for an illegal or delinquent offense (do not include arrests for minor traffic violations)?"	0.129 (0.335)
<i>Disability</i>		
Learning disability or emotional condition only	Includes learning disability or attention disorder or emotional/mental problem or behavior problems that limit the kind of schoolwork or other daily activities the youth can perform, the amount of time the youth can spend on these activities or the youth's performance in these activities (reference = no disability).	0.048 (0.214)
Chronic condition only	Asthma, heart conditions, anemia, diabetes, cancer, epilepsy, infectious disease, kidney conditions, allergies, or any other chronic health condition or life threatening disease (reference = no disability).	0.068 (0.252)
Physical disability only	Missing finger, hand, arm, toe, foot, or leg; permanent stiffness or any deformity of the fingers, hand, or arm; missing or deformed internal organ(s); scars/birthmarks; or other external body parts (including head, chest, and back) (reference = no disability). ^a	0.006 (0.077)
Sensory condition only	Blindness, vision difficulties, hearing difficulty, deafness, speech impairment, or other trouble seeing, hearing, or speaking (reference = no disability).	0.110 (0.314)
Multiple disabilities, including learning disability or emotional condition	Indicates if a youth has ever had conditions in more than one domain – including learning disability or emotional condition <i>plus</i> chronic health condition, physical disability, or sensory condition (reference = no disability).	0.039 (0.193)
Multiple disabilities, not including learning disability or emotional condition	Indicates if a youth has ever had conditions in more than one domain - not including learning disability or emotional conditions (reference = no disability).	0.021 (0.142)
<i>Youth characteristics</i>		
Male	Youth is male (reference = female).	0.507 (0.500)
Non-Hispanic Black	Youth is non-Hispanic Black (reference = white).	0.257 (0.437)
Hispanic	Youth is Hispanic (reference = white).	0.201 (0.401)
<i>Household characteristics</i>		
Youth attended Head Start program	Parental response to, "Did [this youth] ever attend an official, government sponsored Head Start program?" (reference = did not attend Head Start).	0.199 (0.399)

	Variable description	Proportion and standard deviation
Youth lived with both biological parents at age 6	Retrospective report (reference = all other family arrangements aside from "both biological" and "one biological and one step-parent").	0.463 (0.499)
Youth lived with one biological and one step-parent at age 6	Retrospective report (reference = all other family arrangements aside from "both biological" and "one biological and one step-parent").	0.138 (0.345)
Parental highest degree: high school	Biological parents have a high school degree as their highest level of education (reference = less than a high school degree).	0.578 (0.494)
Parental highest degree: college	Biological parents have a college degree or more as their highest level of education (reference = less than a high school degree).	0.256 (0.436)
N		7232

Source: National Longitudinal Survey of Youth 1997

^aThese are the terms used in the text of the parental questionnaire

Table 2

Logistic regression of running away, stealing, and property crimes on disability, youth characteristics, and household characteristics

	Ran away	Stole less than \$50	Stole more than \$50	Destruction of property	Other property crime
<i>Disability</i>					
Learning disability or emotional condition only	1.71 *** (0.23)	1.07 (0.12)	2.19 *** (0.31)	1.24 (0.14)	1.14 (0.18)
Chronic condition only	0.96 (0.13)	0.92 (0.09)	1.04 (0.16)	0.76 * (0.08)	0.80 (0.13)
Sensory condition only	0.99 (0.11)	0.92 (0.07)	0.83 (0.11)	0.84 * (0.07)	0.78 (0.11)
Physical disability only	0.94 (0.42)	1.85 * (0.58)	0.46 (0.34)	1.02 (0.34)	0.88 (0.48)
Multiple disabilities, including learning disability or emotional condition	2.09 *** (0.30)	1.27 (0.16)	1.70 ** (0.28)	1.37 * (0.18)	1.37 (0.23)
Multiple disabilities, not including learning disability or emotional condition	1.15 (0.26)	1.07 (0.18)	0.82 (0.24)	0.85 (0.16)	1.21 (0.30)
<i>Youth characteristics</i>					
Male	0.72 *** (0.05)	1.48 *** (0.07)	1.96 *** (0.16)	2.42 *** (0.13)	4.07 *** (0.36)
Non-Hispanic Black	0.66 *** (0.06)	0.63 *** (0.04)	0.98 (0.10)	0.62 *** (0.05)	0.79 * (0.08)
Hispanic	0.83 * (0.08)	0.90 (0.06)	1.08 (0.12)	0.73 *** (0.05)	0.91 (0.10)
<i>Household characteristics</i>					
Youth attended Head Start program	1.36 *** (0.12)	1.08 (0.07)	0.90 (0.09)	1.10 (0.08)	1.04 (0.11)
Youth lived with both biological parents at age 6	0.53 *** (0.04)	0.68 *** (0.04)	0.56 *** (0.05)	0.73 *** (0.05)	0.70 *** (0.06)
Youth lived with one biological and one step-parent at age 6	1.18 (0.11)	1.15 (0.09)	0.97 (0.11)	1.06 (0.09)	0.96 (0.11)
Parental highest degree: high school	0.71 *** (0.06)	1.20 * (0.09)	0.85 (0.09)	1.18 * (0.09)	1.06 (0.12)
Parental highest degree: college	0.53 *** (0.06)	1.18 (0.10)	0.67 ** (0.09)	1.03 (0.10)	0.94 (0.13)
Log Likelihood	-2988.15	-4711.15	-2377.36	-4313.31	-2367.57

Source: National Longitudinal Survey of Youth 1997; N=7,232. Data shown are odds ratios with standard errors for the odds ratios in parentheses

p<0.001,

**
p<0.01,

*
p<0.05; two-tailed tests

Note: Models also include controls for exposure

Table 3

Logistic regression of carrying a hand gun, gang membership, attack, selling drugs, and arrest on disability, youth characteristics, and household characteristics

	Hand gun	Gang member	Attacked	Sold drugs	Arrest
<i>Disability</i>					
Learning disability or emotional condition only	1.49 ^{***} (0.21)	2.14 ^{***} (0.32)	1.70 ^{***} (0.20)	1.09 (0.18)	1.81 ^{***} (0.25)
Chronic condition only	1.05 (0.15)	0.96 (0.16)	0.97 (0.11)	0.87 (0.14)	0.93 (0.14)
Sensory condition only	0.87 (0.11)	0.80 (0.12)	1.01 (0.09)	1.00 (0.12)	0.85 (0.11)
Physical disability only	1.91 (0.80)	1.91 (0.95)	1.51 (0.54)	0.56 (0.34)	1.65 (0.72)
Multiple disabilities, including learning disability or emotional condition	1.50 ^{***} (0.24)	2.24 ^{***} (0.37)	1.61 ^{***} (0.21)	1.19 (0.21)	1.63 ^{***} (0.25)
Multiple disabilities, not including learning disability or emotional condition	1.20 (0.29)	1.65 [*] (0.42)	1.11 (0.22)	1.09 (0.28)	0.83 (0.23)
<i>Youth characteristics</i>					
Male	5.13 ^{***} (0.45)	2.51 ^{***} (0.22)	2.01 ^{***} (0.12)	1.78 ^{***} (0.14)	2.18 ^{***} (0.17)
Non-Hispanic Black	0.70 ^{***} (0.07)	1.32 [*] (0.14)	1.27 ^{***} (0.09)	0.48 ^{***} (0.05)	0.80 [*] (0.08)
Hispanic	0.79 [*] (0.08)	1.78 ^{***} (0.19)	0.95 (0.08)	0.85 (0.09)	0.94 (0.09)
<i>Household characteristics</i>					
Youth attended Head Start program	1.18 (0.11)	1.49 ^{***} (0.14)	1.18 [*] (0.09)	1.26 [*] (0.13)	1.31 ^{**} (0.12)
Youth lived with both biological parents at age 6	0.76 ^{***} (0.06)	0.54 ^{***} (0.05)	0.59 ^{***} (0.04)	0.53 ^{***} (0.05)	0.48 ^{***} (0.04)
Youth lived with one biological and one step-parent at age 6	0.94 (0.11)	1.02 (0.12)	1.09 (0.09)	1.06 (0.11)	0.90 (0.10)
Parental highest degree: high school	0.85 (0.09)	0.73 ^{**} (0.07)	0.86 (0.07)	0.92 (0.10)	0.75 ^{**} (0.07)
Parental highest degree: college	0.64 ^{***} (0.08)	0.42 ^{***} (0.06)	0.58 ^{***} (0.06)	0.88 (0.11)	0.43 ^{***} (0.06)
Log Likelihood	-2570.82	-2150.34	-3829.28	-2472.40	-2591.32

Source: National Longitudinal Survey of Youth 1997; N=7,232. Data shown are odds ratios with standard errors for the odds ratios in parentheses

p<0.001,

**
p<0.01,

*
p<0.05; two-tailed tests

Note: Models also include controls for exposure

Table 4
Percentage of adolescents with specific conditions who engage in delinquent acts

	N	Ran away from home	Carried a handgun	Gang membership	Stole less than \$50	Stole more than \$50	Destruction of property	Other property crime	Attacked	Sold drugs	Arrested
No disability	5121	14.55	12.54	9.30	37.57	10.21	31.87	11.11	23.98	11.07	12.24
<i>Learning disabilities or emotional conditions</i>											
Learning disability or attention disorder	238	18.49	13.35	18.49	39.08	21.01	34.45	13.03	34.45	13.03	18.07
Emotional/mental problem or behavior problem ^a	81	32.10	12.90	16.05	43.21	25.93	48.15	17.28	39.51	9.88	25.93
<i>Chronic conditions</i>											
Asthma	382	13.35	13.35	9.42	34.82	9.95	25.13	9.42	23.82	11.26	10.47
Heart condition	31	29.03	12.90	6.45	32.26	12.90	48.39	16.13	32.26	9.68	12.90
Other chronic condition	64	10.94	17.19	7.81	48.44	12.50	28.13	6.25	20.31	3.13	18.75
<i>Sensory conditions</i>											
Blindness	21	4.76	0	4.76	28.57	0	23.81	4.76	19.05	4.76	28.57
Other vision difficulty	546	13.55	9.34	6.96	36.45	8.42	27.29	8.24	22.34	12.09	9.52
Hearing difficulty	85	21.18	15.29	7.06	31.76	9.41	34.12	9.41	27.06	11.76	16.47
Speech impairment	75	20.00	20.00	6.67	42.67	10.67	36.00	17.33	34.67	10.67	8.00
Other sensory condition	16	25.00	31.25	12.50	43.75	18.75	37.50	12.50	37.50	6.25	12.50

Note: All listed categories are mutually exclusive to necessitate comparison within disability domains. As a result, youth with multiple conditions are not represented in this table

Source: National Longitudinal Survey of Youth 1997. Data shown are percentages unless otherwise indicated

^aThese are the terms used in the text of the parental questionnaire