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Children with Disabilities in Poor Households: Association with Juvenile and Adult Offending

Karen M. Matta Oshima, MSW [doctoral students], Jin Huang, MSW [doctoral students], Melissa Jonson-Reid, PhD [associate professors], and Brett Drake, PhD [associate professors]

George Warren Brown School of Social Work, Washington University in St. Louis.

Abstract

Disabled youths are arrested, adjudicated, and recidivate at higher rates than their nondisabled peers. Although multiple theories have been offered to explain the relationship between disability and delinquency, the empirical evidence is limited and contradictory. Little is known about how disability may be associated with offending once poverty and family risks like maltreatment are controlled for. Using administrative data from a Midwest state, this article discusses results from a Cox regression of juvenile and young adult offending outcomes for low income disabled compared with nondisabled youths ($N = 1,568$). Youths with disabilities had higher rates of juvenile court petitions than similarly low-income peers. In models of adult offending, there was no relationship between disability status and adult arrest, but youths who had received educational services for emotional disturbance or other categories of health impairment had higher risk of entering adult corrections.

Keywords

adolescents; delinquency; disability; learning disabilities; poverty

Disabled youths are arrested, adjudicated, and recidivate at higher rates than their nondisabled peers (Morris, Schoenfeld, Bade-White, Joshi, & Morris, 2006; Wagner, Newman, Cameto, Levine, & Garza, 2006). Although multiple theories have been offered to explain the relationship between disability and delinquency, the empirical evidence is limited and contradictory. For example, little is known about whether disability status is associated with juvenile or adult offending above and beyond risks associated with poverty or child maltreatment. If children with disabilities are more at risk for later offending behavior, then targeting prevention to those systems where disability is identified and served is a logical approach. If, however, the increased risk of offending can be explained by poverty or experience of maltreatment, then may suggest an approach of targeting these areas of risk rather than focusing on services for disabilities. This study helps fill a gap in knowledge by increasing our understanding of whether disability status is associated with a higher risk of later juvenile or adult offending within a low-income sample that excludes children with any report of abuse or neglect.

Address correspondence to Karen M. Matta Oshima, George Warren Brown School of Social Work, Washington University in St. Louis, One Brookings Drive, Campus Box 1196, St. Louis, MO 63130; koshima@gwbmail.wustl.edu.

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Background

Youths with disabilities are overrepresented in the juvenile and adult justice systems. Between 23.0% and 57.7% of youths in correctional and detention facilities have some type of disability (Morris & Morris, 2006; Morris et al., 2006). This range of figures compares with approximately 13.0% of youths in the general population (Mears, Aron, & Bernstein, 2003). Among juvenile delinquents with disabilities, 40.0% have a learning disability, 46.0% have a behavioral disorder, and 14.0% have both (Zabel & Nigro, 1999). Casey and Keilitz's (1990) meta-analysis estimated that 12.6% of juvenile offenders had mental retardation.

Disability status has also been found to be associated with the pattern of offending over time. Morris et al. (2006) found that disabled youths (84.5%) are adjudicated at a higher rate than their nondisabled peers (39.1%) and recidivate at a higher rate (77.0% versus 43.6%). Among youths transitioning to young adulthood from special education, 19.0% were arrested within two years after high school (Doren, Bullis, & Benz, 1996). One study found that half of youths with learning disabilities and 58.0% of children labeled emotionally disturbed were arrested (Wagner et al., 2006). Bullis and Yovanoff (2005) found that incarcerated youths with disabilities who exited juvenile corrections were two times less likely to be engaged in school or work within 12 months following their release. In that same study, youths engaged in work or school were significantly less likely to recidivate.

From prior studies, however, it is not clear whether the apparent relationship between disability and offending behaviors can be explained by other factors. For example, gender and race are associated with both designation of disability in special education and offending. Boys and minorities have higher rates of delinquent and adult criminal behaviors (Gottfredson & Hirschi, 1990; Hagan, 1998; Landsheer, Oud, & Van Dijkum, 2008). Although male and female students comprise equal proportions of the school-age population, male students account for approximately two-thirds of all students served in special education (Doren et al., 1996). One study found that the relationship between disability and delinquency varied by gender (Bright & Jonson-Reid, 2008). African Americans are also more likely to be placed into special education (Patton, 1998).

Parental and family characteristics may also confound the relationship. Family poverty increases the risk for delinquency, and community poverty compounds the increased risk of delinquency associated with family poverty (Hay, Fortson, Hollist, Altheimer, & Schaible, 2007). Poverty is associated with higher rates of, and limitations due to, disability (Hogan, Msall, Rogers, & Avery, 1997). Poor children in special education have higher rates of behavioral problems while in school (Office of Special Education Programs, 2003), which may be a precursor to offending. Child abuse and neglect is associated with poverty, child disability, (Jonson-Reid, Drake, Kim, Porterfield, & Lu, 2004; Lee, Sills, & Oh, 2002) and delinquency (Jarjoura, Triplett, & Brinker, 2002; Wiig & Widom, 2003). Other family-level risks associated with offending include lower maternal age at the birth of a child (Conseur, Rivara, Barnoski, & Emanuel, 1997; Fergusson & Woodward, 1999), parental education attainment, maternal working status (Vander Ven, Cullen, Carrozza, & Wright, 2001), and parental mental health disorder (Prochnow & DeFronzo, 1997).

Theoretical Framework

Although theories of school failure, susceptibility, differential treatment, and meta-cognitive deficits have been proposed to explain the relationship between disability and offending behavior, few studies have tested these theories. School failure theory posits that disabilities lead to problems in school, causing negative self-image, which in turn leads to delinquent behaviors (Brier, 1989; Larson, 1988). Susceptibility theory and meta-cognitive theory are

similar in asserting that neurological and intellectual problems such as poor impulse control, inability to anticipate consequences, and difficulties in problem solving contribute to delinquent behaviors (Keilitz & Dunivant, 1987; Malmgren, Abbot, & Hawkins, 1999). In contrast, differential treatment theory suggests that youths with disabilities participate in delinquent behaviors at the same rate as peers but lack the social skills to avoid detection or deal effectively with police, social workers, and other authorities; this leads to a higher official incidence rate because these youths are more likely to be formally processed (Keilitz & Dunivant, 1987; Malmgren et al., 1999; Morrison & Cosden, 1997). Current support for these theories is scant and mixed. Waldie and Spreen (1993) found greater support for susceptibility theory than for school failure theory, but in both instances, 25.0% to 35.0% percent of cases were unclassified by such models. In another study, Malmgren et al. (1999) found no direct relationship between having a learning disability and juvenile delinquency. Given the limited and contradictory empirical research, much remains unknown regarding the nature of the relationship between disabilities and offending behaviors.

Present Study

Consistent with much of the literature on juvenile delinquency, the present study used an ecological approach to try to better understand the relationship of disability to delinquency and adult criminal behavior. As reviewed earlier, several individual, family, and community factors are associated with disability and offending behaviors (Bright & Jonson-Reid, 2008; Preski & Shelton, 2001; Rolf, Dustin, Magda, & Adrian, 2007). The present study adds to the literature by examining both juvenile and adult offending behaviors while controlling for ecological risks such as poverty and maltreatment. There were two research questions:

1. In a low-income sample, does disability, as measured by special education participation, increase the risk of delinquent and/or adult criminal behavior?
2. Do different types of disabilities have differing associations with juvenile and adult offending?

Method

This analysis used data from a larger longitudinal study of poor compared with maltreated children (Jonson-Reid et al., 2004). At the time of initial sampling (1993–94), children lived in families with current or recent receipt of Aid to Families with Dependent Children (AFDC); all children were age 11 or younger ($N = 96,440$). The children in the low-income-only comparison group were randomly selected from the larger population of families on AFDC with children of similar age ($N = 11,986$). One child per family was randomly selected to be followed in the longitudinal study ($n = 5,082$). This group was further limited to those who were 19.5 years of age at the end date of midyear 2006 ($n = 2,158$). However, some children in the low-income-only comparison group were later reported for maltreatment. For this analysis, the interest was in examining the separate effects of poverty and disability without maltreatment. Thus, we excluded 590 children (of whom 158 were in the “disabled” category) who had reports of maltreatment after the sampling period, resulting in a final sample of 1,568.

Data Preparation

All data was obtained from electronic administrative records. For these analyses, data were records from the state child welfare agency (to exclude those with reports of abuse or neglect), city and county juvenile courts (delinquency petitions), state Department of Corrections, state Department of Social Services (AFDC/Temporary Assistance for Needy Families [TANF]), state Department of Mental Health, state Highway Patrol, state

Department of Health and Vital Statistics (to censor out cases for death), and city and county Special Education Departments. All data were deidentified before analysis. The data for this study remained physically and electronically separate from the larger set of data used in the parent study. All procedures involving data collection and management were approved by the Human Research Protection Office of Washington University in St. Louis.

Measures

Dependent Variables

The three dependent variables were (1) having a juvenile court petition before age 18, (2) entering the adult correction system, and (3) having a record of arrest after age 18. Dependent variables were examined as date of onset and dummy-coded indicators. The dummy code of the occurrence of the event (yes or no) and the date of the event or the date of the end of the study were used to construct the time interval from the study start to the event or to censoring.

Independent Variables

The primary independent variable was disability status as defined by eligibility for special education (including type of disability). Disability was examined as a dummy-coded indicator (yes or no) and also according to four categories of disability delineated in the Individuals with Disability in Education Act (IDEA) (1990): learning disability (LD), such as perceptual disabilities, brain injury, and dyslexia; emotional disturbance (ED), such as depression, anxiety, or interpersonal difficulties or behaviors that negatively affect a student's ability to learn; other health impaired (OHI), which is limited strength, vitality, or alertness or hyperalertness caused by a chronic health conditions such as attention-deficit hyperactivity disorder (ADHD), diabetes, or lead poisoning; and other disabilities such as mental retardation or autism. Children with ED or OHI were combined into one group because of low frequencies and because OHI also includes mental health problems like ADHD (see Table 1).

Control Variables

Control variables, measured at the time of sampling, were as follows: children's individual characteristics: gender, race (African-American compared with not African-American), and age; parental characteristics: age when the child was born, education level (high school graduation or not), and publicly funded mental health services (received services or not); and 1990 census variables (tract level): high school graduation rate, unemployment rate, and household median income. Because income status may change over time, welfare participation was characterized by duration (in months) and a dichotomous variable indicating whether children had a second spell of the AFDC/TANF participation. These two welfare participation variables were considered a proxy for family economic well-being. The descriptive statistics for these variables are reported in Table 1.

Analytic Strategy

Analyses for this article were conducted using STATA 10.1 for Windows. Before the multivariate Cox regression models of offending were conducted, the bivariate survival analyses between each independent variable and dependent variable were used to test the equality of survivor functions (log-rank test for categorical independent variables and simple Cox model for continuous independent variables). The estimated survivor functions from the bivariate tests were graphed to assess the proportional assumptions of the Cox regression models. The square of children's age was also included in the model, allowing us to capture potential nonlinear relationship between age and outcomes of interest. Given that neighborhood environment variables are usually highly correlated, only one of them (high

school graduation rate) was included in the Cox regression models. The inclusion of other neighborhood variables in the models did not produce different results. In addition, welfare duration by month was added into the models using its logarithm because of the skewness of the original variable. For all survival analyses in this article, the date of birth of children was used to define when a subject became at risk. The time scale was defined in years. Hazard ratios were interpreted as measures of the risk of the outcome. The clustered effect of census tracts was adjusted using robust standard errors allowing the intragroup correlation in each census tract. To understand the unique contributions of disability status on offending behaviors, we entered independent and control variables into the models, hierarchically. All multivariate Cox regression models satisfied the proportional-hazards assumption on the basis of Schoenfeld residual test.

Results

The prevalence of children with disabilities in this study was much higher than the national estimate—nearly 13.0% in 2001 (Wagner, Cameto, & Guzman, 2003), which is not unexpected because of the poverty status of the sample. Most children in the sample were categorized as African-American (84.2%), which reflected the demographics of families receiving welfare in the study region. Additionally, the study families often lived in less advantaged communities. The mean high school graduation rate (61.7%) and the average household median income (\$24,468 in 1990 dollars) were much lower than the national averages (75.2% and \$30,056). Table 1 lists additional demographic variables.

Next, we compared sample characteristics by children's disability status using the chi-square test or the independent *t* test (see columns 2 and 3 of Table 1). Children with disabilities had statistically higher percentage of boys than did the nondisability group [Pearson $\chi^2 = 16.53$, $p = .0001$]. Children with disabilities stayed in the AFDC/TANF program much longer than their counterparts without disabilities [$t(595.94) = 6.41$, $p = .000$], and they were also more likely to enter into the program twice (63.2% versus 56.8%) [Pearson $\chi^2 = 3.89$, $p = .002$]. However, there were no significant differences in median family income between the two groups. Children with disabilities did have statistically significantly higher rates of delinquent and adult offending records, but the differences were not practically large.

We conducted bivariate survival analyses between independent and control variables and each outcome variable. The log-rank test was used for categorical variables, and the simple Cox regression model was used for continuous variables. Three variables—disability status (disability higher), gender (boys higher), and welfare duration (longer duration higher)—were significant at the .05 level for delinquency and adult arrest and trended toward significance for adult corrections. In addition to these three variables, children's age and a second spell of AFDC/TANF participation had a relationship with the higher risk of adult correction. Because children's disability status was the major independent variable of this study, only the bivariate results of disability status (dummy measure) and three outcome variables are reported in Table 2.

Multivariate Analyses of Offending

Disability and Delinquency—Five models examining the relationship between children's disability status and delinquent offenses—adding variables hierarchically according to individual controls, parent and community controls, and characteristics of welfare participation—are reported in Table 3. In model 1, without controlling for any other variables, children with disabilities had higher risk of having delinquency petitions (hazard ratio = 1.48), but this relationship diminished as controls were added. Next, children's characteristics were added in model 2. Male children had about 1.5 times higher risk than female children. The inclusion of parental and neighborhood characteristics in model 3 had a

slight impact on the relationship between children's disability status and the outcome (hazard ratio = 1.34). Our family and community indicators were, however, limited. Finally, when duration of welfare participation was controlled, the effect for disability became nonsignificant.

Disability and Adult Correction—We used a similar analytic strategy to examine the relationship between childhood disability and adult corrections (see Table 4). The model specifications from model 1 to model 4 were completely the same as those for delinquency, as shown in Table 3. Model 5 added children's delinquency status as an independent variable to explain the outcome of adult correction. Male children and children living in families with longer welfare duration had a higher risk of adult correction (hazard ratios = 6.27 and 1.20, respectively, in Model 4). As expected, having delinquency in childhood increased the risk of adult correction (hazard ratio = 1.96), and the association with welfare duration in childhood became nonsignificant. The child's disability status was not significant.

Disability and Adult Arrest—To examine the relationship between childhood disability and adult arrest, we tested five models similar to those in Table 4. The proportional assumption was satisfied in the final model [Wald $\chi^2(12, N=1536)=12.27, p=.42$]. Similar to the outcomes of delinquency and adult correction, male children had higher risk of adult arrest (hazard ratio = 3.32 in model 5) (see Table 5). When children's welfare participation was controlled for in model 4, having disability had no relationship to the likelihood of adult arrest. Even welfare duration was not significant in model 5, with children's delinquency status controlled for. Both disability status and welfare duration had a statistical relationship with delinquency (see Table 3). Disability and poverty may have indirect effects on adult arrest through childhood delinquency.

Question 2: Disability Types and Offending Outcomes

Children with different disability diagnoses could have varying developmental trajectories and display distinct patterns of offending behaviors. Therefore, we used a four-group categorical variable (no disability, LD, ED/OHI, and other disabilities) to replace the dummy measure of childhood disability in the models. The results for the final model of each outcome variable are displayed in Table 6. No differences were found for the relationships between control variables and outcomes. However, there were differences according to disability category. There was a trend toward an association between a label of LD and risk of delinquent offenses (hazard ratio = 1.30) compared with the no disability group. Only children categorized as ED/OHI had a higher risk for adult corrections (hazard ratio = 3.87) after all other factors were controlled for. There was no association between disability type and adult arrest after welfare duration and delinquency were controlled for.

Discussion and Implications

Rates of offending behavior for children with disabilities were higher than for similarly poor peers. In multivariate models, however, such differences were only consistent for delinquency and only until welfare duration was controlled. Once welfare patterns were controlled, there were no overall differences between disabled and nondisabled peers for adult offending, with one exception. In models examining disability types, youths with educational diagnoses of ED or OHI were at higher risk of entering adult corrections than were those with no disability.

Our findings suggest a moderate relationship between disability status and later delinquency. For delinquent outcomes, it is possible that the theories of Brier (1989), Larson (1988),

Keilitz and Dunivant (1987), Malmgren et al., (1999), and Morrison and Cosden (1997) are correct and that patterns of school failure, difficulties in social relations, or both increase the likelihood of juvenile offending. Our research was not able to assess school success or peer relationships, nor did disability status remain statistically significant in the final model. However, given that the reasons for longer welfare duration may be more difficult to address, there may be utility in targeting children in school with identified special education needs for delinquency-prevention activities.

A longer duration on welfare was associated with both delinquency and adult offending. This contrasts with a prior study that found no relationship between welfare duration and delinquency, but that study lacked controls for disability and maltreatment and followed cases from 1987 to 1992 (Cao, Cao, & Zhao, 2004). The importance of longer welfare duration in criminal offending may be a proxy for greater needs within the family that are preventing a more rapid and permanent exit from welfare. Further research is needed to better understand this aspect of the relationship between welfare duration and criminality. Further research is also needed to examine this association within the context of welfare reform, which would predict shorter duration.

Mental health problems (as indicated by having an ED or OHI diagnosis) did not predict delinquent offending, but they were important in later adult offending patterns. If one can assume that young adults who enter the corrections system as opposed to just having an arrest history are more serious offenders, earlier adequate attention to mental health needs may result in later cost savings. Research indicates that children with disabilities who need mental health care often do not receive it (Witt, Kasper, & Riley, 2003). National data indicate that less than 53.0 percent of schools offer such services to children with disabilities (Office of Special Education Programs, 2003).

Juvenile court also seems a likely target for preventing later adult offending behavior. Although few first-time juvenile offenders receive intervention through the juvenile justice system (Rolf et al., 2007; Sickmund, 2003) the court may be able to assist these offenders in obtaining services. For example, the juvenile court may be able to refer to the child's special education need in the disposition and then monitor whether the needed services are being received postdisposition (Burrell & Warboys, 2000). If Brier (1989) and Larson (1988) were correct that later offending for children with disabilities is secondary to school failure, helping students obtain the services they need may offset this outcome.

Limitations and Implications for Future Research

Owing to the nature of the administrative data that were used, it was not possible to assess undocumented needs for mental health intervention, deviant peer association, or relative success in school. Nor was it possible to control for other potential family risk factors like exposure to domestic violence. Also, the sample was split racially between African American and Caucasian subjects with the majority being African American (84.2%). This precludes generalizability to other populations. Also, the sample was generated from a single region. Because identification of disability and eligibility for income maintenance vary from state to state, results may not be generalizable to other regions.

Future research is needed to replicate this study in areas with greater racial and ethnic diversity. Finally, even with a large sample, adult offending events were relatively rare due to the relatively young age of the subjects. It is possible that these findings would change as the subjects grow older, given that many are still in the peak years of adult offending. This was, however, the first known study to use longitudinal data to attempt to disentangle the effects of poverty and disability relative to offending behaviors. Future studies should combine administrative and direct-measure sources to further explore the path to offending

behavior. Although the present work can suggest systemic targets for intervention, only such future work can suggest specific forms of intervention within those systems.

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Table 1

Sample Descriptive Statistics, by Disability Status and Outcomes

Variable	Overall Sample (N = 1,568)		No Disability Subsample (n = 1,283)		Disability Subsample (n = 285)	
	Freq. (%)	M (SD)	Freq. (%)	M (SD)	Freq. (%)	M (SD)
Disability status						
Dummy measure (yes)	285 (18.2)					
Multinomial measure						
No disability	1,283 (81.8)					
Learning disability	150 (9.6)					
Emotional disturbance and other health impaired	21 (1.3)					
Other disabilities	165 (7.7)					
Outcomes of interest						
Delinquency status (yes)*	203 (13.0)		154 (12.0)		49 (17.2)	
Adult corrections status (yes)*	104 (6.6)		77 (6.0)		27 (9.5)	
Adult arrest status (yes)**	148 (9.4)		108 (8.4)		40 (14.0)	
Individual characteristics						
Gender (male)***	792 (50.5)		617 (48.1)		175 (60.1)	
Age in 2005 (years)		19.8 (2.0)		19.8 (2.0)		19.7 (1.9)
Race (African-American)*	1,307 (84.2)		1,056 (83.3)		251 (88.1)	
Parental characteristics						
Age at birth of child (years)		23.6 (5.9)		23.6 (5.9)		23.6 (6.2)
High school graduation (yes)	968 (62.4)		797 (62.9)		171 (60.2)	
Unemployment status (yes)	1,568 (100)		1,283 (100)		285 (100)	
Mental health services (yes)	58 (3.7)		48 (3.7)		10 (3.5)	
Local-level variables						
High school graduation rate (%)		61.7 (13.2)		61.6 (13.1)		62.0 (13.4)
Unemployment rate		7.4 (3.6)		7.3 (3.6)		7.8 (3.6)
Household annual median income (dollars)		24,468.90 (1,0931.40)		24,515.20 (10,906.20)		24,260.90 (11,060.90)
Welfare participation						

Variable	Overall Sample (N = 1,568)		No Disability Subsample (n = 1,283)		Disability Subsample (n = 285)	
	Freq. (%)	M (SD)	Freq. (%)	M (SD)	Freq. (%)	M (SD)
AFDC/TANF duration (months) ***		50.7 (56.5)		46.9 (54.2)		67.9 (63.1)
Entering second spell (yes) *	908 (58.0)		728 (56.8)		180 (63.2)	

Notes: Significance levels apply to comparisons of children with and without disabilities. Freq. = frequency; TANF = Temporary Assistance for Needy Families.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 2

Bivariate Survival Analysis: Disability and Outcomes of Interest

Disability Status	Delinquent Offending ^a		Adult Correction ^b		Adult Arrest ^c	
	Events Observed	Events Experienced	Events Observed	Events Experienced	Events Observed	Events Experienced
Yes	49	35.9827	27	20.30	40	25.92
No	153	166.02	77	83.70	108	122.08

^aPearson $\chi^2 = 5.87, p = .0154$.

^bPearson $\chi^2 = 3.06, p = .0802$.

^cPearson $\chi^2 = 9.53, p = .0020$.

Table 3

Multivariate Survival Analysis: Risk of Delinquency Petition, According to Disability Status

Variable	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	Coef.	HR	Coef.	HR	Coef.	HR	Coef.	HR
Disability (yes/no)	0.39** (0.15)	1.48 [1.11, 1.97]	0.31* (0.15)	1.37 [1.02, 1.83]	0.30* (0.15)	1.34 [1.00, 1.80]	0.21 (0.15)	1.22 [0.91, 1.65]
Male			0.37* (0.15)	1.44 [1.08, 1.93]	0.39** (0.15)	1.60 [1.00, 2.54]	0.40** (0.15)	1.49 [1.12, 1.99]
African-American			0.44 (0.23)	1.55 [.98, 2.43]	0.47* (0.24)	1.48 [1.10, 1.97]	0.41 (0.24)	1.50 [0.94, 2.41]
Age (children)			0.19 (0.88)	1.21 [.21, 6.85]	0.26 (0.88)	1.30 [.23, 7.33]	0.30 (0.88)	1.36 [0.24, 7.57]
Age-square (children)			-0.00 (0.02)	0.99 [.95, 1.04]	-0.01 (0.02)	0.99 [0.95, 1.04]	-0.01 (0.02)	0.99 [0.95, 1.03]
Mother's age					-0.00 (0.01)	1.00 [0.97, 1.03]	-0.00 (0.01)	1.00 [0.97, 1.02]
Mother's education (high school graduate or not)					-0.15 (0.15)	0.86 [0.65, 1.14]	-0.10 (0.15)	.91 [0.68, 1.21]
Mother's mental health services (yes/no)					0.56 (0.29)	1.76 [0.99, 3.12]	0.45 (0.29)	1.57 [0.89, 2.75]
High school graduation rate (census tract)					0.00 (0.00)	1.00 [0.99, 1.01]	0.00 (0.00)	1.00 [0.99, 1.01]
Welfare duration							0.17* (0.07)	1.18 [1.02, 1.36]
Second welfare spell							0.10 (0.16)	1.10 [0.81, 1.51]

Notes: Robust standard errors appear in parentheses; confidence intervals of hazard ratios appear in square brackets. Coef. = coefficient; HR = hazard ratio.

^aWald $\chi^2(1, N = 1,568) = 7.17, p = .0154$.^bWald $\chi^2(5, N = 1,553) = 16.62, p = .005$.^cWald $\chi^2(9, N = 1,537) = 23.34, p = .005$.^dWald $\chi^2(11, N = 1,536) = 35.57, p = .001$.* $p < .05$.** $p < .01$.

Table 4
Multivariate Survival Analysis: Risk of Adult Correction Entry, According to Disability Status

Variable	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d		Model 5 ^e	
	Coef.	HR	Coef.	HR	Coef.	HR	Coef.	HR	Coef.	HR
Disability (yes/no)	0.40 [†] (0.22)	1.49 [0.97, 2.28]	0.18 (0.23)	1.20 [0.77, 1.87]	0.15 (0.23)	1.16 [0.74, 1.82]	0.05 (0.24)	1.05 [0.65, 1.69]	0.03 (0.24)	1.03 [0.64, 1.66]
Male	1.87 ^{***} (0.28)	6.49 [3.73, 11.27]	1.89 ^{***} (0.29)	6.61 [3.78, 11.58]	1.90 ^{***} (0.29)	6.65 [3.80, 11.65]	1.84 ^{***} (0.29)	6.27 [3.57, 11.02]	1.84 ^{***} (0.29)	6.27 [3.57, 11.02]
African-American	0.54 (0.34)	1.72 [0.89, 3.32]	0.54 (0.34)	1.71 [0.88, 3.32]	0.45 (0.34)	1.58 [0.81, 3.05]	0.42 (0.34)	1.51 [0.78, 2.93]	0.42 (0.34)	1.51 [0.78, 2.93]
Age (children)	-1.42 (1.76)	0.24 [0.01, 7.66]	-1.29 (1.77)	0.27 [0.01, 8.86]	-1.22 (1.75)	0.29 [0.01, 9.07]	-1.19 (1.73)	0.31 [0.01, 9.12]	-1.19 (1.73)	0.31 [0.01, 9.12]
Age-square (children)	0.03 (0.04)	1.03 [0.95, 1.12]	0.03 (0.04)	1.03 [0.95, 1.12]	0.03 (0.04)	1.03 [0.95, 1.11]	0.03 (0.04)	1.02 [0.95, 1.11]	0.03 (0.04)	1.02 [0.95, 1.11]
Mother's age			0.00 (0.02)	1.00 [0.97, 1.03]	0.00 (0.02)	1.00 [0.97, 1.03]	0.00 (0.02)	1.00 [0.97, 1.03]	-0.00 (0.02)	1.00 [0.97, 1.03]
Mother's education (high school graduate or not)			-0.36 (0.19)	0.70 [0.49, 1.00]	-0.28 (0.19)	0.75 [0.52, 1.10]	-0.27 (0.20)	0.76 [0.52, 1.12]	-0.27 (0.20)	0.76 [0.52, 1.12]
Mother's mental health services (yes/no)			0.08 (0.49)	1.08 [0.41, 2.82]	-0.06 (0.49)	0.94 [0.36, 2.44]	-0.09 (0.44)	0.91 [0.39, 2.16]	-0.09 (0.44)	0.91 [0.39, 2.16]
High school graduation rate (census tract)			-0.01 (0.01)	0.99 [0.98, 1.01]	-0.01 (0.01)	0.99 [0.97, 1.01]	-0.01 (0.01)	0.99 [0.98, 1.01]	-0.01 (0.01)	0.99 [0.98, 1.01]
Welfare duration			0.19 [*] (0.09)	1.20 [1.00, 1.45]	0.16 (0.21)	1.18 [0.77, 1.80]	0.17 (0.10)	1.19 [0.99, 1.43]	0.17 (0.10)	1.19 [0.99, 1.43]
Second welfare spell					0.16 (0.21)	1.18 [0.77, 1.80]	0.12 (0.22)	1.13 [0.74, 1.72]	0.12 (0.22)	1.13 [0.74, 1.72]
Delinquency							0.67 ^{**} (0.24)	1.96 [1.23, 3.11]	0.67 ^{**} (0.24)	1.96 [1.23, 3.11]

Notes: Robust standard errors appear in parentheses; confidence intervals of hazard ratios appear in square brackets. Coef. = coefficient; HR = hazard ratio.

^aWald $\chi^2(1, N = 1,568) = 3.32, p = .068$.

^bWald $\chi^2(5, N = 1,553) = 55.91, p = .000$.

^cWald $\chi^2(9, N = 1,537) = 62.41, p = .000$.

^dWald $\chi^2(11, N = 1,536) = 63.80, p = .000$.

^eWald $\chi^2(12, N = 1,536) = 86.20, p = .000$.

[†] $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 5

Multivariate Survival Analysis: Risk of Adult Arrest, According to Disability Status

Variable	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d		Model 5 ^e	
	Coef.	HR	Coef.	HR	Coef.	HR	Coef.	HR	Coef.	HR
Disability (yes/no)	0.56** (0.19)	1.75 [1.21, 2.53]	0.41* (0.19)	1.49 [1.04, 2.17]	0.38* (0.19)	1.47 [1.01, 2.12]	0.30 (0.19)	1.35 [0.94, 1.95]	0.27 (0.19)	1.30 [0.89, 1.59]
Male	1.26*** (0.20)	3.51 [2.35, 5.23]	1.27*** (0.20)	3.56 [2.39, 5.30]	1.28*** (0.20)	3.59 [2.41, 5.33]	1.20*** (0.20)	3.32 [2.23, 4.96]	1.20*** (0.20)	3.32 [2.23, 4.96]
African-American	0.21 (0.23)	1.23 [0.79, 1.92]	0.19 (0.23)	1.08 [0.76, 1.91]	0.12 (0.24)	1.13 [0.71, 1.80]	0.07 (0.23)	1.07 [0.68, 1.68]	0.07 (0.23)	1.07 [0.68, 1.68]
Age (children)	-0.01 (1.33)	0.99 [0.07, 13.49]	0.07 (1.32)	1.00 [0.08, 14.32]	0.09 (1.32)	1.09 [0.08, 14.44]	0.04 (1.31)	1.04 [0.08, 13.69]	0.04 (1.31)	1.04 [0.08, 13.69]
Age-square (children)	0.00 (0.03)	1.00 [0.94, 1.07]	-0.00 (0.03)	1.00 [0.94, 1.06]	-0.00 (0.03)	1.00 [0.94, 1.06]	-0.00 (0.03)	1.00 [0.94, 1.06]	-0.00 (0.03)	1.00 [0.94, 1.06]
Mother's age			0.00 (0.01)	1.00 [0.98, 1.03]	0.00 (0.01)	1.00 [0.98, 1.03]	0.00 (0.01)	1.00 [0.97, 1.03]	0.00 (0.01)	1.00 [0.98, 1.03]
Mother's education (high school graduate or not)			-0.27 (0.15)	0.76 [0.56, 1.03]	-0.21 (0.16)	0.81 [0.59, 1.11]	-0.24 (0.16)	0.79 [0.57, 1.08]	-0.24 (0.16)	0.79 [0.57, 1.08]
Mother's mental health services (yes/no)			0.01 (0.44)	1.01 [0.43, 2.38]	-0.11 (0.45)	0.90 [0.37, 2.16]	-0.19 (0.46)	0.82 [0.33, 2.03]	-0.19 (0.46)	0.82 [0.33, 2.03]
High school graduation rate (census tract)			-0.01 (0.01)	0.99 [0.98, 1.00]	-0.01 (0.01)	1.00 [0.98, 1.00]	-0.01 (0.01)	0.99 [0.98, 1.00]	-0.01 (0.01)	0.99 [0.98, 1.00]
Welfare duration			0.17* (0.08)	1.19 [1.02, 1.38]	0.17* (0.08)	1.19 [1.02, 1.38]	0.13 (0.08)	1.14 [0.98, 1.33]	0.13 (0.08)	1.14 [0.98, 1.33]
Second welfare spell			0.11 (0.15)	1.12 [0.84, 1.48]	0.11 (0.15)	1.12 [0.84, 1.48]	0.08 (0.15)	1.08 [0.82, 1.44]	0.08 (0.15)	1.08 [0.82, 1.44]
Delinquency					0.98*** (0.15)	2.66 [1.78, 3.97]			0.98*** (0.15)	2.66 [1.78, 3.97]

Notes: Robust standard errors appear in parentheses; confidence intervals of hazard ratios appear in square brackets. Coef. = coefficient; HR = hazard ratio.

^aWald $\chi^2(1, N = 1,568) = 8.78, p = .003$.

^bWald $\chi^2(5, N = 1,553) = 47.40, p = .000$.

^cWald $\chi^2(9, N = 1,537) = 54.85, p = .000$.

^dWald $\chi^2(11, N = 1,536) = 57.49, p = .000$.

^eWald $\chi^2(12, N = 1,536) = 92.32, p = .000$.

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

 $p < .001$.

Table 6

Risk of Adolescent or Adult Offending Behavior among Subjects with Disabilities, by Disability Type

Variable	Delinquency ^a		Adult Correction ^b		Adult Arrest ^c	
	Coef.	HR	Coef.	HR	Coef.	HR
Learning disability	0.26 [†] (0.14)	1.30 [0.96, 1.84]	0.09 (0.29)	1.09 [0.63, 1.93]	0.10 (0.27)	1.10 [0.64, 1.88]
Emotional disturbance or other health impaired	0.24 (0.53)	1.27 [0.45, 3.64]	1.36 ^{**} (0.51)	3.87 [1.43, 10.53]	0.64 (0.50)	1.90 [0.71, 5.07]
Other disabilities	-0.19 (0.37)	0.82 [0.40, 1.70]	-0.91 (0.54)	0.40 [0.11, 1.44]	-0.54 (0.51)	0.58 [0.21, 1.58]
Male	0.39 ^{**} (0.15)	1.48 [1.12, 1.98]	1.79 ^{***} (0.29)	5.99 [3.41, 10.52]	1.20 ^{***} (0.21)	3.31 [2.21, 4.98]
African-American	0.42 (0.24)	1.51 [0.95, 2.43]	0.39 (0.34)	1.48 [0.76, 2.87]	0.07 (0.23)	1.08 [0.68, 1.69]
Age (children)	0.24 (0.88)	1.27 [0.23, 7.14]	-1.49 (1.76)	0.23 [0.01, 7.11]	-0.07 (0.23)	0.93 [0.07, 12.28]
Age-square (children)	-0.00 (0.02)	1.00 [0.95, 1.04]	0.03 (0.04)	1.03 [0.95, 1.12]	0.00 (0.03)	1.00 [0.94, 1.07]
Mother's age	-0.00 (0.01)	1.00 [0.97, 1.02]	-0.00 (0.02)	1.00 [0.97, 1.02]	0.00 (0.01)	1.00 [0.98, 1.03]
Mother's education (high school graduate or not)	-0.19 (0.15)	0.92 [0.68, 1.23]	-0.28 (0.21)	0.76 [0.51, 1.13]	-0.23 (0.17)	0.79 [0.57, 1.10]
Mother's mental health services (yes/no)	0.42 (0.29)	1.53 [0.86, 2.70]	-0.11 (0.45)	0.90 [0.38, 2.15]	-0.20 (0.45)	0.82 [0.34, 2.00]
High school graduation rate (census tract)	0.00 (0.00)	1.00 [0.99, 1.01]	-0.01 (0.01)	0.99 [0.98, 1.42]	-0.01 (0.01)	0.99 [0.98, 1.01]
Welfare duration	0.17 (0.08)	1.19 [1.02, 1.38]	0.16 (0.10)	1.17 [0.97, 1.42]	0.15 [*] (0.08)	1.16 [0.99, 1.36]
Second welfare spell	0.10 (0.16)	1.11 [0.81, 1.51]	0.18 (0.24)	1.19 [0.78, 1.82]	0.10 (0.15)	1.10 [0.83, 1.46]
Delinquency			0.67 ^{**} (0.24)	1.95 [1.21, 3.14]	0.98 ^{***} (0.21)	2.67 [1.78, 4.01]

Notes: Robust standard errors appear in parentheses; confidence intervals of hazard ratios appear in square brackets. Coef. = coefficient; HR = hazard ratio.

^aWald $\chi^2(12, N = 26,844) = 32.70, p = .001$.^bWald $\chi^2(14, N = 1,536) = 99.37, p = .000$.^cWald $\chi^2(14, N = 1,536) = 95.39, p = .000$.

[†] $p < .10$.
^{*} $p < .05$.
^{**} $p < .01$.
^{***} $p < .001$.