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BY TODD C. HONEYCUTT AND DAVID R. MANN

Crime and Parenthood: Factors Affecting the Outcomes of Adolescents With and Without Disabilities

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Abstract

BACKGROUND: Adolescents often engage in behaviors that can detrimentally affect outcomes for the rest of their lives. In addition to avoiding such behaviors, youth with disabilities face other challenges that complicate their transitions into adulthood.

OBJECTIVE: In this analysis, we explore how two risk factors (criminal behavior and parenthood) in adolescence influenced the education and employment outcomes of young adults. We pay special attention to the interaction between disability status and these factors.

METHOD: Using data from the 1997 National Longitudinal Survey of Youth, we produce summary statistics and estimate several regression models; examining respondent outcomes at age 24.

RESULTS: Despite increased prevalence among youth with disabilities, parenthood and crime did not appear to affect education or employment outcomes any more than these factors affected the outcomes of youth without disabilities.

CONCLUSION: Multiple risk factors are intertwined and are associated with poorer outcomes, which suggest the need for better identification issues and supports in secondary school. The issue of higher prevalence of dropping out of high school and having certain risk factors might reflect the lower cognitive ability of youth with mental limitations, but environmental factors could also be influential.

Keywords: Transition-age youth, disability, crime, parenthood, employment, education

A. Introduction

Adolescents are prone to engage in behaviors that could jeopardize their health, education, and employment outcomes, and adolescents with disabilities might be even more disposed to these behaviors. Because youth with disabilities have a more precarious transition to adulthood than youth without disabilities (Loprest and Wittenburg, 2009), engaging in activities that further put their transitions at-risk could potentially have an additional negative influence on their outcomes into adulthood.

This paper focuses on two potential factors —becoming a parent and committing crimes as minors—that could affect the transitions of adolescents with and without disabilities. We used data from the National Longitudinal Survey of Youth 1997 (NLSY97) to examine the prevalence and likelihood of becoming a parent (for females) or engaging in one of three types of crime by the time youth are age 18. We also looked at the influence of these factors on two key aspects of the transition into adulthood: employment and educational outcomes by age 24. Throughout the analysis, we considered the relationships in the context of dropping out of school and in respect to a youth's disability status.

We find the following: (1) among youth who complete high school, those who became parents or participate in crime were less likely to obtain a college degree than those who did not engage in such behaviors; (2) women who become parents as adolescents had fewer years of full-time employment between ages 18 and 24 than women who did not become parents, but among all youth, engaging in criminal activities had no effect on years of employment; (3) youth with mental limitations were consistently more likely to become parents or participate in crime than were youth with other limitations; and (4) among youth with disabilities, those who became parents or participate in crime had similar outcomes to those who did not.

B. Background

1.   Risky Behaviors and Youth

Youth and young adults engage in risky behaviors at higher rates than older individuals. By risky behaviors, we include behaviors that could lead to negative consequences for health, education, employment, and other outcomes. Such behaviors include criminal activity; involvement with the juvenile justice system; smoking, alcohol use, and drug abuse; unprotected sexual activity; suicide; and overeating and physical inactivity. Trends for many of these behaviors have declined over the past two decades (smoking and drinking behaviors, for instance), but still present concerns because of the prevalence and the consequences of the behaviors. For example, recent data on high school students suggest that 17 percent had carried a weapon and 32 percent had been in a physical fight in the past 12 months (Eaton et al., 2012). Many of these behaviors tend to peak at the end of adolescence.

This analysis focuses on two factors related to risky behavior. The first is participation in criminal activities. Data from the first round of NLSY97 show that 44 percent of youth ages 13 to 18 engaged in minor property crime, 25 percent reported violent behavior (such as carrying a weapon), and 10 percent had obtained illegal income (such as through selling drugs) (Apel and Kaukinen, 2008). The second, teenage parenthood, could potentially result from risky behavior (unprotected sexual behavior), but could also be an intentional decision on the part of a youth or

result from unwanted sexual activity or assault. About one in five women become parents by age 18 (Martinez et al., 2011).

These factors may have serious implications for youths' later lives, resulting in unintended (or unanticipated, on the part of the youth) effects. Having a child, for instance, is positively correlated with not completing high school, poor short-term employment, greater poverty, and increased reliance on government benefits (Hoffman and Maynard, 2008). Youth who commit crimes can be caught, arrested and incarcerated. Arrests peak at about ages 18 to 20 and then decline for many crimes (Bureau of Justice Statistics, 2012; Snyder, 2011); about 30 percent of youth are arrested by the time they are age 23 (Brame et al., 2012). Those incarcerated can have their educational attainment derailed and have limited opportunities for employment (Raphael, 2007; Western, 2002).

However, these factors might not result in pervasive, long-lasting effects. For example, while engaging in criminal activity can be interrelated with lower educational attainment (with causality uncertain), adolescent criminal behavior might not lead to poorer employment outcomes as young adults, though it is intertwined with poorer educational outcomes (Levitt and Lochner, 2001). Teen mothers, by virtue of having their children at an earlier age, could have higher earnings in midlife, while their peers who delayed parenthood stay at home with children (Hotz et al., 2005).

Past research indicates that crime and parenthood are more prevalent among youth with disabilities than youth without disabilities, though not consistently across different types of disabilities. For example, youth with disabilities who receive Supplemental Security Income have higher rates of school delinquency, school suspensions, and involvement with the juvenile justice system than youth in the general population (Wittenburg and Loprest, 2007). Parenthood by age 20 is higher for females with mild disabilities; with disabilities that interfere with school; or with physical, emotional, or behavioral conditions than for females without disabilities (Shandra, 2011). Specific criminal or delinquent behaviors, such as running away, stealing more than $50, carrying a handgun, belonging to a gang, selling drugs, and assault, are more prevalent for youth with learning disabilities or emotional conditions by age 16 than youth without disabilities, whereas youth with other types of health conditions largely have rates similar to youth without health conditions (Shandra and Hogan, 2012).

The National Longitudinal Transition Survey-2 (NLTS2) has been instrumental in documenting many risk factors for one group of youth with disabilities, those receiving special education services (and is primarily composed of youth with learning disabilities). For this population, 8 percent of youth ages 16 to 19 had become a parent and 29 percent had been arrested, with females having higher rates than males for the former and males having higher rates than girls for the latter (Wagner et al., 2005). High rates for criminal behavior, such as carrying weapons and fighting, were observed for this group even up to eight years after leaving high school (Newman et al., 2011). Among the sample, youth with diagnoses of emotional disturbances and learning disabilities often had higher rates of crime and parenthood than youth with other diagnoses. A key limitation of the NLTS2, though, is that it does not include a sample of youth without disabilities, making comparisons difficult.

For youth with disabilities, crime and parenthood may further compound their outcomes on employment experience and education ("human capital outcomes") as adults and limit the

opportunities available to them. Poor outcomes for youth with disabilities in these areas relative to youth without disabilities have been well documented (for example, Wells et al., 2003; Horvath-Rose et al., 2004), and for youth with mental, emotional, and learning conditions in particular (Newman et al., 2011; Zablocki and Krezmien, 2012). Committing crimes or becoming parents may therefore further attenuate these outcomes. For example, youth with disabilities who are incarcerated as minors might have particular difficulty in later employment (Bullis and Yovanoff, 2006; Cuellar et al., 2006).

One confounding factor in the relationship between having a disability and factors that put youth at risk of poor outcomes is not completing high school, which may be a choice in as much as it is a response. In the general population, youth who drop out of high school are more likely to engage in criminal activities than youth who do not, while increased years of schooling is associated with decreased criminal activity (Lochner, 2004; Lochner and Moretti, 2004). It is difficult, however, to determine the direction of causality—that is, whether the factors involved in dropping out of school lead to other risk factors, or whether the engagement in risk factors leads to the factors involved in dropping out of school. This causal circularity can result in biased parameter estimates—that is, estimates whose expectations conditional on the data are not the parameters' true values—if educational status is included as a predictor of a risk factor or not sufficiently accounted for as an explanatory variable.

2.   Research Questions and Hypotheses

The study answers two research questions regarding how disability intersects with parenthood and criminal behavior. Our first research question involves prevalence: were youth with disabilities more likely to become parents or commit crimes by age 18 than youth without disabilities? We anticipate based on prior research that youth with disabilities were more likely to become parents and engage in criminal behaviors than youth without disabilities. Our second research question involves the effects of these factors on long-term outcomes: What were the differential effects of crime and (for females) parenthood on human capital outcomes, accounting for disability status, after adolescents become young adults? We hypothesize that youth with and without disabilities who committed crimes or became parents as adolescents had poorer human capital outcomes (in terms of years of full-time employment and college education attainment) by age 24 compared with their counterparts without such factors.

Our analysis builds on previous research by examining the effect of crime and parenthood in adolescence on outcomes as young adults and the differential effects of having a disability on that relationship.

C. Methods

1.   Data

The data for the analysis are from NLSY97. NLSY97's 8,984 respondents were ages 12 to 16 on December 31, 1996. Thirteen annual NLSY97 survey rounds were available at the time of our analysis. NLSY97's national cross-section sample contains 6,748 respondents; the remaining 2,236 respondents comprise NLSY97's Hispanic and black oversamples. The NLSY97 disability data used in the analysis were collected during NLSY97's first and sixth survey rounds.

Our analysis sample excluded some NLSY97 respondents. We included only respondents for whom we could measure the variables of interest. For this reason, we dropped all observations for 1,538 respondents who left the sample permanently by age 24. Because our disability measure captured how each respondent's disability status evolved from rounds one to six, we excluded an additional 1,144 NLSY97 respondents whose disability status was not known at both survey rounds. We dropped another 61 respondents from the sample because their records were missing one or more measures of parenthood or crime. Finally, we eliminated 91 more respondents due to missing education, demographic, or functional limitation data. We used code from the Bureau of Labor Statistics, which administers the NLSY97, to construct customized weights that scale the remaining sample to be nationally representative.

The analysis sample included 6,150 youth observed through age 24. We tracked the youth by academic year, which we defined as July 1 through June 30.

One concern with omitting cases is whether individuals with disabilities were more likely to be dropped or included in the sample, potentially biasing the results. To examine this issue, we looked at the round 1 disability prevalence by exclusion status. The round 1 disability statuses were similar between the analysis sample (13 percent, N=6,211), the sample excluded because of missing background characteristics (12 percent, N=102), the sample excluded because of a lack of round 6 disability information (14 percent, N=307), and the sample excluded because they dropped out of the survey by age 24 for whom we had round 6 disability information (12 percent, N=686). However, youth excluded because they left the sample before the age of 24 were less likely to have a disability (10 percent, N=588) than the analysis sample, a difference that was significant at $p<.05$ using a chi-square test. (Note that sample members could be in more than one excluded category.) This pattern suggests that people with a disability in the first round were somewhat less likely to be excluded from the analysis.

2. Measures

Disability characteristics. NLSY97 asked questions across four impairment categories: physical (having a deformed or missing body part), chronic (diagnosed with a chronic condition or disease such as asthma or diabetes), sensory (having trouble seeing, hearing, or seeing), and mental (having an eating disorder; a learning or emotional problem; or a mental condition that limited the ability to attend school or work). For each category, respondents were asked whether they had that type of impairment. If the answer was yes, the respondent was then asked which condition(s) was (were) associated with that impairment and whether the condition(s) limited his or her ability to function.

To capture the disability status of NLSY97 respondents, we created two limiting impairment categories. First, we combined NLSY97's chronic, physical, and sensory impairment categories, leaving us with a mental impairment category and a physical/sensory impairment category. Then, for each impairment category, we flagged as having a disability anyone who reported having a functionally limiting condition in rounds one or six. Impairment categories were not mutually exclusive as some individuals had multiple impairments than spanned different categories.

About 20 percent of the sample reported having a functionally limiting impairment (Table 1). Among those with an impairment, about 46 percent had a mental impairment and the remaining 54 percent had a sensory, physical, or chronic impairment.

Table 1. Frequency of Sample Characteristics

Variable	Unweighted percentage	Weighted percentage
Number	**6,150**	**15,427,000**
Disability characteristics		
No limiting impairment	80.3	79.8
Sensory or physical limiting impairment	13.9	14.0
Mental limiting impairment	9.1	9.5
Demographic characteristics		
Female	50.4	49.7
Black	27.1	15.2
Hispanic	19.8	12.3
White	52.3	71.3
Other	0.9	1.2
Youth age at first interview		
12	14.6	15.2
13	20.5	20.4
14	21.1	20.7
15	20.4	19.7
16	18.1	18.5
17	5.3	5.4
Household income relative to the federal poverty ratio		
0-99%	19.0	13.8
100-199%	18.0	17.0
200-299%	16.2	18.0
300% or more	29.6	35.7
Missing	17.2	15.5
Intact family	49.8	54.2
MSA status		
Not in MSA	19.4	21.4
In MSA, not in central city	47.1	51.6
In MSA, in central city	32.4	26.0
In MSA, not known	1.1	1.0
U.S. Census region		
Northeast	16.9	17.6
North Central	24.3	28.2
South	38.1	34.1
West	20.7	20.2
Education and Employment Outcomes by Age 24		
Education status		
Did not complete high school	20.9	18.3
High school diploma	55.5	54.3
Obtained associate's or higher postsecondary degree	23.5	27.4
Years full-time employment		
0	7.6	6.2
1	8.6	7.7
2	10.6	9.8
3	12.1	11.8
4	15.0	14.9
5	17.1	17.8
6	15.9	17.2
7	13.2	14.7

Note: NLSY97 rounds 1-13. N = 6,150. Data are weighted using study-specific weights as described in the methods section.

Demographic characteristics. Several demographic characteristics were included in our analysis, such as gender, race/ethnicity (non-black/non-Hispanic, black, Hispanic, and mixed); age at first interview; household income (relative to the federal poverty level [FPL]); family structure (intact [with both biological parents residing in the household] or nonintact [all other parent combinations]); residence in a metropolitan statistical area (MSA) in round 1; and region of residence during round 1. Table 1 includes frequency distribution for these characteristics.

The summary statistics show that our analysis sample represented a diverse collection of youth. The weighted statistics show that the sample was split almost evenly by gender, intact family status, and census region. About 30 percent of sample members reported being non-white. Except for age 17, the sample was divided rather evenly across youths' age at first interview. Almost 80 percent of the sample lived in an MSA and slightly more than 50 percent lived in an MSA but not in a central city. Slightly less than half of youth reported incomes between 0 percent and 300 percent of the FPL, with about 14 percent having incomes below 100 percent of the FPL.

Education and employment. We used two measures to capture the employment and education outcomes of youth by age 24. For education, we defined three educational attainment outcome categories at age 24: did not complete high school (dropout, which includes individuals who obtained a general equivalency diploma [GED]); completed high school (high school graduate); and earned an associate's, bachelor's, professional, or graduate degree (college graduate). The categories were populated using the respondents' self-report of highest degree earned. We then used the categories to create indicator variables for high school and college completion. Employment experience was the sum of years of employment accumulated between ages 18 and 24. Youth who worked any hours during at least two-thirds of the weeks in an academic year were considered to have worked that year.

Table 1 includes summary statistics for the education and employment outcomes. The weighted statistics indicate that 82 percent of the sample completed high school by age 24, which is consistent with other data sources. Slightly more than a quarter of sample members earned an associate's degree or better by age 24. The distribution of employment experience starts with 6 percent having zero years of experience by age 24, rises steadily from zero to five years, peaks at five years at 18 percent, and then declines to 15 percent for seven years.

Crime and parenthood. Our study examined adolescent risk factors using four primary measures constructed from NLSY97 data. A youth was recorded as having a risk factor if he or she reported the factor at least once in any academic year on or before age 18. (For a few individuals ages 16 or 17 in the first interview, we could not identify risk factors for academic age 18 because of the spacing between the first and second interview rounds; for these individuals, we used their values for academic age 19, which included their experiences at age 18.) For parenthood, we identified female youth who had a biological child during or before the academic year they were age 18, even if the child did not reside in the same residence as the mother. The property crime measure was a summary measure indicating whether a youth reported destroying property, stealing items of any value, or other property crime (such as fencing or selling stolen property). Violent crime included one of three behaviors: attacking someone, joining a gang, or carrying a handgun. Illegal income reflected criminal activities to obtain income, such as selling illegal drugs or stolen property.

We restricted our parenthood measure to females for two reasons. First, a higher proportion of females report parenthood by age 18 than males; only 2 percent of males reported becoming a parent by age 18. Second, females might be more affected, in terms of short- and long-term outcomes, by parenthood than males (for example, missing school because of birth or restricted ability to work because of child care issues).

We also created a composite measure that identified male youth who reported a criminal behavior (that is, property crime, violent crime, or illegal income) in at least two academic years, and who reported at least two years of activity for at least two of the three criminal behaviors. This measure identifies youth with the most persistent criminal behaviors.

Risk factor summary statistics are reported in Table 2 by high school completion and disability status. Among all youth, those with disabilities appeared more likely to commit crimes than those with no impairments. For instance, 25 percent of those without impairments, 30 percent of those with sensory and physical impairments, and 38 percent of those with mental impairments committed a violent crime. Youth with mental impairments appeared more likely than youth with sensory or physical impairments to commit crimes. In aggregate, differences in parenthood among females were less pronounced across groups. High school noncompletion was relatively higher among youth with impairments. About 24 percent of those with a sensory or physical impairment and 35 percent of those with a mental impairment dropped out of high school, compared with 16 percent of youth without impairments.

Turning to the statistics disaggregated by high school completion status, regardless of disability status, crime and parenthood appeared most prevalent among high school dropouts. For instance, among youth without an impairment, 4 percent of high school graduates and 30 percent of high school dropouts reported being a parent by age 18. Among those with a sensory or physical limitation, the pattern was similar: by age 18, 6 percent of high school graduates and 28 percent of high school dropouts were parents. Our rates of parenthood are slightly lower than both the national estimates presented earlier and other analyses of NLSY97, in part because of the sample restrictions we imposed and the use of a slightly lower age cutoff (parenthood by age 18 rather than by age 20, as with Shandra [2011])

3.   Analytical Approach

To examine our research questions, we estimated three sets of models. The first set estimated each risk factor as a function of disability status. Our second set of models used disability status and various risk factors to predict college completion among high school graduates. The third and final set of models estimated years of full-time employment experience accumulated between ages 18 and 24 as a function of education, disability status, and risk factors.

Risk factors. Although it is unsurprising that dropping out of high school and factors such as parenthood or crime are positively correlated, it is unclear in which direction any potential causality occurs. Does dropping out lead to a risk factor or do risk factors cause youth to drop out of school? Models that regard risk factors as a function of dropout status will return unbiased estimates only if the causality goes in that direction. Conversely, risk factor models that omit dropout status fail to account for a potentially important factor.

Table 2. Descriptive Statistics for Parenthood and Criminal Behavior (percentages unless otherwise specified)

	No limiting impairment	Sensory or physical limiting impairment	Mental limiting impairment
All youth			
Number	4,937	855	562
Did not complete high school	16	24	35
Parenthood (females only)	8	11	12
Property crime	33	34	44
Violent crime	25	30	38
Illegal income	17	20	27
Multiple crime areas (males only)	16	20	27
High school noncompleters			
Number	934	224	210
Parenthood (females only)	30	28	27
Property crime	43	39	53
Violent crime	45	48	57
Illegal income	31	26	39
Multiple crime areas (males only)	26	32	46
High school completers			
Number	4,003	631	352
Parenthood (females only)	4	6	4
Property crime	32	32	39
Violent crime	21	25	28
Illegal income	15	18	21

Note: NLSY97 rounds 1-13. N = 6,150 (3,099 for parenthood, 3,049 for multiple crimes). Data are weighted using study-specific weights as described in the methods section.

To begin to understand the relationship between disability and risk factors, we estimated separate logistic regression models for high school graduates and dropouts. The logistic regression coefficient estimates and accompanying odds ratios provide easily interpretable results and always predict outcome values in the [0, 1] probability range. After considering other specifications, we decided to use separate models because the approach was feasible and would at least enable us to formally test whether the parameter estimates describing the probability of risk factors varied by high school completion status. We initially attempted to find an instrumental variable for dropout status, which would have enabled us to control for any endogeneity bias. Unfortunately, we were unable to identify a strong, valid instrument in our data. Each model predicted a risk factor as a function of disability onset status, mental disability status, and additional controls:

$$\Pr\left(ATRISK_i = 1\right) = \frac{1}{1 + e^{-g_i}}$$
$$(1) \quad g_i = \alpha_1 physen_i + \alpha_2 mental_i + \Lambda X_i + \varepsilon_i$$

In Equation (1), *ATRISK* is an indicator variable that equals one if that youth has a certain risk factor by age 18, *i* is the individual youth subscript, *physen* is an indicator for having a functionally limiting physical or sensory impairment, *mental* is an indicator for having a functionally limiting mental impairment, and *X* is a vector of demographic control variables.

College completion. Having a risk factor by age 18 has the potential to influence an individual's ability to complete high school. But do risk factors along with a disability further decrease the likelihood that a youth will not go on to earn a college degree? To investigate this question, we estimated a series of logistic regression models to predict college completion as a function of disability status and risk factors:

$$\Pr\left(COLLEGE_i = 1\right) = \frac{1}{1 + e^{-f_i}}$$

$$f_i = \beta_1 atrisk_i + \beta_2 physen_i + \beta_3\left(physen_i \cdot atrisk_i\right) + \beta_4 mental_i +$$
$$(2) \quad \beta_5\left(mental_i \cdot atrisk_i\right) + \mathrm{B}X_i + \upsilon_i$$

In Equation (2), COLLEGE is a Bernoulli variable that equals one if an individual completes college by age 24.

We were interested specifically in the probability that, having certain risk factors by age 18, a youth with disability went on to complete college. We also usually know by age 18, however, whether an individual dropped out of high school and that the vast majority of high school dropouts did not go on to earn a college degree. Consequently, we estimated these models using data only from high school graduates.

Employment experience. Finally, to examine how disability and risk factors affect a youth's ability to work into early adulthood, we estimated a series of linear regression models:

$$exxp_i = \gamma_1 atrisk_i + \gamma_2 dropout_i + \gamma_3\left(physen_i \cdot dropout_i\right) + \gamma_4\left(physen_i \cdot graduate_i\right) +$$
$$\gamma_5\left(physen_i \cdot atrisk_i\right) + \gamma_6\left(mental_i \cdot dropout_i\right) + \gamma_7\left(mental_i \cdot graduate_i\right) +$$
$$(3) \quad \gamma_8\left(mental_i \cdot atrisk_i\right) + \mathrm{N}X_i + \eta_i$$

Within Equation (3), exxp is years of full-time employment experience obtained between ages 18 and 24, dropout is an indicator for dropping out of high school, and graduate (1-dropout) is an indicator for high school completion. Additionally, X now includes a college completion indicator. The model was estimated using the entire sample.

Years of employment experience is considered count data as it takes only nonnegative integer values. There is some concern with using a linear regression model for count data because this model type can predict negative outcome values. Therefore, to test the robustness of our results, we also estimated a Poisson regression model (results not shown). The Poisson model is specially qualified to model count data because it does not predict negative values of the outcome variable. Results across the two models were consistent.

D.   Results

1.   Were youth with disabilities more likely to become parents or commit crimes by age 18 than youth without disabilities?

The logistic regression results for crime and parenthood among high school dropouts and graduates are presented in Table 3. To facilitate an easy comparison between different specifications, Table 3 includes estimates that use the entire sample to model risk factors.

Estimating the risk factor regressions separately for high school dropouts and graduates strongly affects the parameter estimates. The full sample models suggest that youth with mental impairments were more likely to engage in criminal behaviors than are those without impairments. However, when we divided the sample by high school completion and estimate separate models, the effect of mental impairments on crime and parenthood disappeared among high school graduates. For high school dropouts, however, the mental impairment effect remained and grew in magnitude; such youth were more likely to engage in criminal behaviors than were those without impairments. The growth in magnitude of the mental impairment coefficient was especially strong for youth who commited multiple crimes. Among high school graduates, those with sensory and physical limitations appeared more likely to engage in criminal behaviors (significant at the 10 percent level) than were those without any limitations. For high school dropouts, however, there was no link in the models we estimated between impairment status and risk factors. Only the impairment estimates for the parenthood model appeared consistent across subpopulations with no relationship. When we formally tested whether the estimates across any of the risk factor models were the same with a Chow test, we concluded— even for the parenthood model—that the estimates were all different.

2.   What were the differential effects of crime and parenthood on human capital outcomes, accounting for disability status, after adolescents become young adults?

College completion. Parameter estimates from the college completion models indicate that having one or multiple risk factors negatively influenced the likelihood that a high school graduate earned a college degree by age 24. Table 4 reports parameter estimates for the college completion predictive models. For each model, the included risk factor decreased the probability of completing college. The odds ratio results revealed that parenthood had a particularly strong negative effect on college completion, with mothers being about 25 percent as likely to earn a college degree as those who did not have children. Engaging in one or more criminal behaviors was associated with being about half as likely to complete college as someone with no criminal history. In addition, youth with mental impairments were less likely to earn a college degree than those without any limiting impairment.

Table 3. Regression-Adjusted Results Predicting Crime and Parenthood

Disability group	Full sample				High school noncompletion				High school completion			
	Estimate	Standard error	p-value	Odds ratio	Estimate	Standard error	p-value	Odds ratio	Estimate	Standard error	p-value	Odds ratio
Parenthood (females only)												
No limiting impairment	Reference				Reference				Reference			
Sensory/physical limiting impairment	0.241	0.182	0.187	1.27	-0.040	0.279	0.887	0.96	0.383	0.259	0.139	1.47
Mental limiting impairment	0.041	0.245	0.869	1.04	-0.207	0.315	0.512	0.81	-0.356	0.465	0.443	0.70
Property Crime												
No limiting impairment	Reference				Reference				Reference			
Sensory/physical limiting impairment	-0.070	0.092	0.447	0.93	-0.235	0.189	0.212	0.79	-0.039	0.106	0.715	0.96
Mental limiting impairment	0.360	0.104	<0.001	1.43	0.513	0.182	0.005	1.67	0.209	0.130	0.106	1.23
Violent Crime												
No limiting impairment	Reference				Reference				Reference			
Sensory/physical limiting impairment	0.205	0.096	0.032	1.23	0.086	0.188	0.649	1.09	0.212	0.115	0.066	1.24
Mental limiting impairment	0.391	0.107	<0.001	1.48	0.476	0.182	0.009	1.61	0.137	0.141	0.333	1.15
Illegal Income												
No limiting impairment	Reference				Reference				Reference			
Sensory/physical limiting impairment	0.041	0.110	0.708	1.04	-0.335	0.201	0.095	0.72	0.155	0.132	0.241	1.17
Mental limiting impairment	0.416	0.118	<0.001	1.52	0.515	0.190	0.007	1.67	0.208	0.159	0.192	1.23
Multiple Crime Areas (males only)												
No limiting impairment	Reference				Reference				Reference			
Sensory/physical limiting impairment	0.100	0.161	0.536	1.10	-0.179	0.282	0.526	0.84	0.163	0.204	0.426	1.18
Mental limiting impairment	0.567	0.151	<0.001	1.76	0.934	0.247	<0.001	2.54	0.168	0.212	0.430	1.18

Note. NLSY97 rounds 1-13. Full sample N = 6,150 (3,099 for parenthood, 3,049 for multiple crime areas). High school noncompletion N = 1,288 (567 for parenthood, 721 for multiple crime areas). High school completion N = 4,862 (2,532 for parenthood, 2,328 for multiple crime areas). Table shows logistic regression results of disability measures on risk factors. Regression models include sex (in models with all youth), race/ethnicity, family structure, household poverty status, age at first interview, metropolitan statistical area, and U.S. Census region as covariates, and include study-specific weights as described in the methods section.

Table 4. Regression-Adjusted Results Predicting College Degree Attainment for High School Completers, by Crime and Parenthood Status

Group	Estimate	Standard error	p-value	Odds ratio
Parenthood (females only)				
Parenthood	-1.395	0.359	0.0001	0.25
No limitation	Reference			
Sensory/physical limiting condition	-0.153	0.149	0.305	0.86
Mental limiting condition	-1.148	0.284	<.0001	0.32
Property crime				
Property crime	-0.324	0.090	0.000	0.72
No limitation	Reference			
Sensory/physical limiting condition	-0.049	0.132	0.713	0.95
Sensory/physical limiting condition x property crime	-0.459	0.267	0.086	0.63
Mental limiting condition	-1.165	0.229	<.0001	0.31
Mental limiting condition x property crime	0.249	0.378	0.510	1.28
Violent crime				
Violent crime	-0.791	0.110	<.0001	0.45
No limitation	Reference			
Sensory/physical limiting condition	-0.176	0.127	0.167	0.84
Sensory/physical limiting condition x violent crime	0.193	0.297	0.516	1.21
Mental limiting condition	-0.942	0.195	<.0001	0.39
Mental limiting condition x violent crime	-1.358	0.752	0.071	0.26
Illegal income				
Illegal income	-0.754	0.122	<.0001	0.47
No limitation	Reference			
Sensory/physical limiting condition	-0.213	0.125	0.087	0.81
Sensory/physical limiting condition x illegal income	0.415	0.319	0.194	1.51
Mental limiting condition	-1.164	0.201	<.0001	0.31
Mental limiting condition x illegal income	0.492	0.488	0.313	1.64
Multiple crime areas (males only)				
Multiple crimes	-0.643	0.193	0.001	0.53
No limitation				
Sensory/physical limiting condition	-0.132	0.199	0.508	0.88
Sensory/physical limiting condition x multiple crimes	-0.266	0.601	0.659	0.77
Mental limiting condition	-1.114	0.255	<.0001	0.33
Mental limiting condition x multiple crimes	0.484	0.678	0.475	1.62

Note: NLSY97 rounds 1-13. N = 4,862 (2,532 for parenthood, 2,328 for multiple crime areas). Table shows logistic regression results of risk factors and disability measures on college degree completion among high school graduates. Disability and parenthood interaction terms not included because of small sample. Regression models include sex (in models with all youth), race/ethnicity, family structure, household poverty status, age at first interview, metropolitan statistical area, and U.S. Census region as covariates, and include study-specific weights as described in the methods section.

The coefficients of most interest for our analysis, however, are the terms that interact impairment statuses with criminal behavior; that is, was there an additional effect on college completion by both having a disability and committing a crime? These coefficients capture the marginal effect of both having a disability and engaging in criminal activities. (We could not include an interaction term for becoming a parent and having a disability because of small sample size.) The parameter estimates suggest that, in most cases, having a disability and committing a crime did not make college completion by age 24 less likely. The only exception—at the 10 percent significance level—was for those who engage in property crime.

Employment experience. Table 5 contains the parameter estimates for our employment experience regressions. Because we used a linear regression model to estimate experience, the effect sizes are the parameter estimates.

The results associating employment experience with risk factors are mixed. The estimates suggest that engaging in one or more criminal behaviors did not tend to decrease the amount of employment experience a youth accumulates. For women, however, pregnancy was associated with 0.6 fewer years of employment between ages 18 through 24. High school completion was strongly linked with employment over time. Dropping out of high school tended to decrease the amount of employment experience a youth accumulated between ages 18 and 24, with dropping out associated with at least 1.2 fewer years of employment experience.

Results from the employment models also show that functional impairment status was a strong predictor of employment experience obtained between ages 18 and 24 (Table 5). Regardless of high school completion status, youth with a limiting sensory or physical condition accumulated at least 0.3 fewer years of employment experience than their counterparts without any limiting conditions. High school graduates who had mental impairments also tended to accumulate less employment experience than high school graduates without limiting impairments.

The parameter estimates for the employment models suggest that having a limiting condition and a risk factor had no marginal effect on employment. The marginal effect for risk factors and having a functional limitation or mental impairment was consistently indistinguishable from zero.

E. Discussion

Engaging in criminal behavior or becoming a parent as an adolescent was associated with mixed effects on later outcomes. For women, becoming a parent before age 19 had an expected negative relationship on both obtaining a college degree and on years of full-time employment. Among all youth, engaging in a criminal behavior as an adolescent also had a negative relationship on obtaining a college degree (among high school completers), but no relationship on their employment experiences as young adults.

Table 5. Regression-Adjusted Results Predicting Years of Full-Time Employment, by Crime and Parenthood Status

	Estimate	Standard Error	p-value
Parenthood (females only)			
Parenthood	-0.629	0.175	0.000
High school noncompletion	-1.505	0.143	<.0001
High school noncompletion x sensory/physical limiting condition	-0.559	0.284	0.049
High school completion x sensory/physical limiting condition	-0.414	0.123	0.001
Sensory/physical limiting condition x parenthood	-0.032	0.381	0.933
High school noncompletion x mental limiting condition	-0.070	0.324	0.829
High school completion x mental limiting condition	-0.686	0.223	0.002
Mental limiting condition x parenthood	0.366	0.470	0.436
Property crime			
Property crime	0.044	0.066	0.506
High school noncompletion	-1.196	0.089	<.0001
High school noncompletion x sensory/physical limiting condition	-0.438	0.200	0.028
High school completion x sensory/physical limiting condition	-0.331	0.109	0.003
Sensory/physical limiting condition x property crime	0.131	0.180	0.468
High school noncompletion x mental limiting condition	-0.357	0.216	0.098
High school completion x mental limiting condition	-0.619	0.155	<.0001
Mental limiting condition x property crime	0.015	0.212	0.945
Violent crime			
Violent crime	0.000	0.074	0.996
High school noncompletion	-1.192	0.090	<.0001
High school noncompletion x sensory/physical limiting condition	-0.457	0.203	0.024
High school completion x sensory/physical limiting condition	-0.324	0.106	0.002
Sensory/physical limiting condition x violent crime	0.139	0.189	0.460
High school noncompletion x mental limiting condition	-0.296	0.224	0.186
High school completion x mental limiting condition	-0.588	0.144	<.0001
Mental limiting condition x violent crime	-0.088	0.223	0.694
Illegal income			
Illegal income	-0.107	0.084	0.201
High school noncompletion	-1.179	0.090	<.0001
High school noncompletion x sensory/physical limiting condition	-0.442	0.192	0.022
High school completion x sensory/physical limiting condition	-0.323	0.103	0.002
Sensory/physical limiting condition x illegal income	0.219	0.208	0.292
High school noncompletion x mental limiting condition	-0.454	0.205	0.027
High school completion x mental limiting condition	-0.667	0.140	<.0001
Mental limiting condition x illegal income	0.298	0.237	0.209
Multiple crime areas (males only)			
Multiple crimes	-0.129	0.120	0.281
High school noncompletion	-0.819	0.114	<.0001
High school noncompletion x sensory/physical limiting condition	0.045	0.244	0.852
High school completion x sensory/physical limiting condition	-0.190	0.161	0.238
Sensory/physical limiting condition x multiple crimes	0.155	0.314	0.621
High school noncompletion x mental limiting condition	-0.787	0.283	0.006
High school completion x mental limiting condition	-0.585	0.169	0.001
Mental limiting condition x multiple crimes	0.122	0.315	0.699

Note: NLSY97 rounds 1-13. Full sample N = 6,150 (3,099 for parenthood, 3,049 for multiple crime areas). Table shows ordinary least squares regression results of risk factors, disability, and high school completion measures on years of full-time employment from ages 18 to 24. Regression models include sex (in models with all youth), race/ethnicity, family structure, household poverty status, age at first interview, metropolitan statistical area, U.S. Census region, and college degree as covariates, and include study-specific weights as described in the methods section.

Although we observed higher rates of adolescent parenthood and criminal activity for youth with disabilities than for youth without disabilities in the descriptive statistics, the differences of the outcome between youth with and without disabilities largely dissipated when we accounted for high school completion status and background characteristics. After controlling for these factors, youth with sensory or physical limitations were no more or less likely than youth without limitations to engage in crime or become parents. However, youth with mental limiting conditions who did not complete high school were more likely than youth without limitations to engage in criminal behaviors.

As with previous literature, we observed a negative association between employment and having a limitation, with a larger magnitude for those with mental limitations compared with those with sensory or physical limitations (and for youth with limitations who did not complete high school). We did not, however, observe a negative relationship between high school completers with a sensory or physical disability and college completion, though we did for youth with mental limitations.

Finally, we observed no persistent, confounding effect for having a disability and having a risk factor. That is, for youth with disabilities, committing crimes or becoming a parent was not correlated with employment and education outcomes beyond the negative effects that having a disability or a risk factor had alone.

1.   Limitations

Our results should be interpreted in light of the study's limitations. First, we use a broad measure of self-reported criminal activities: committing any of the measured behaviors at least once during the observation period. Although we used an alternative specification (reporting the behavior across multiple rounds) that was consistent with our results, this approach might not have identified those who were more intensively engaged in criminal behaviors (those who commit crimes more frequently, for instance). Survey respondents might have also underreported their criminal behavior. Second, causality cannot be determined; that is, we cannot say conclusively that having a risk factor results in poorer adult outcomes, or that having a disability results in having a risk factor. Other factors, such as environmental or family contexts, could influence both sides of the equations.

2.   Policy and Research Implications

Several policy and research implications follow from our analysis. First, from a research perspective, when assessing factors that put youth at-risk of poor outcomes, there is an intricate relationship between high school noncompletion and those factors. Risk factors could facilitate high school noncompletion, but dropping out could also encourage risk factor. Models that do not properly account for this complex relationship may produce biased parameter estimates. Our results show that when models of risk factors are estimated separately for high school dropouts and graduates, the parameter estimates differ.

This issue may also extend into the policy realm: that multiple risk factors are intertwined and are associated with poorer outcomes suggests the need for better identification issues and supports in secondary school. The risk that engaging in certain behaviors as an adolescent—becoming a parent, committing crimes—has serious implications for later education outcomes

and, for crimes, potential arrests. Identification strategies to help prevent these behaviors, particularly for youth participating under IDEA, could provide opportunities for educators and counselors to intervene at an early stage to divert youth from engaging in such behaviors and promote high school completion. Other research on the involvement of youth with disabilities in the juvenile justice system (such as Mears and Aron, 2003) has found no systematic prevention or early intervention efforts in schools for youth with disabilities. These types of programs are needed to minimize youths' involvement with the justice system. School seems an appropriate place for such interventions, given that many youth with disabilities, particularly those most at risk of committing crimes or becoming parents (that is, youth with mental limitations) likely could be identified through their participation in special education programs. Improved implementation of interventions to divert youth from engaging in behaviors that put them at-risk could have beneficial effects for this population in both the short and long terms. These programs, however, would likely require additional funding to schools, though these costs could be offset by decreased demands on the justice system, if they were found to divert youth from such involvement.

The issue of higher prevalence of dropping out of high school and having certain risk factors might reflect the lower cognitive ability of youth with mental limitations, but environmental factors could also be influential. Youth with disabilities might be more likely to receive disciplinary actions such as school suspensions, which could result in reduced attachment to school and subsequent dropout behavior, and potentially influencing their later disability status. In this scenario, high school noncompletion might result from a lack of fit between youth and their school environments. Secondary school administrators and educators need to be aware of this link between disability and risk factors to avoid pushing these youth out of school, instead providing even more supports to help such youth maintain their school involvement. Improved supports beyond those already provided through IDEA for youth, particularly youth with limiting mental impairments, could minimize their further entanglement in activities that put them at risk of poor transitions and so promote their high school completion and other outcomes.

Future research could extend this analysis of NLSY97 by looking at other risk factors (either as adolescents or adults) or other adult outcomes. For example, the interplay of activity levels, nutrition, and obesity among youth and adults with differing disability types could be helpful to examine nutritional issues facing this population. Another important area for research includes interactions with the juvenile justice system; a large portion of youth and adults who are incarcerated have a mental or other limiting condition. Though our results suggest that the likelihood of committing a crime is higher for those with mental limitations, it does not seem that the difference alone would account for such high numbers who are incarcerated. NLSY97 could be useful for this investigation, particularly as it continues to follow its sample cohort into adulthood.

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