INCLUDING HIGH SCHOOL STUDENTS WITH DISABILITIES IN REGULAR EDUCATION
ENVIRONMENTS: THE IMPACT ON POST-SCHOOL OUTCOMES

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By
Chandra Mae Linton, B.A.

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ABSTRACT

Since Congress passed the Education of All Handicapped Children Act in 1975, federal government policy regarding the education of children with disabilities is that they should be provided a “free appropriate public education” (FAPE) in the “least restrictive environment” (LRE). The law, however, provides little guidance regarding the meaning of these terms and there is a lack of quantitative evidence that the mandated policy produces positive outcomes for students with disabilities, particularly those with moderate to severe disabilities. As a consequence, this paper explores the effect of inclusion of high school students with disabilities in regular education environments on their subsequent high school graduation, post-graduation activities, residential independence, and social skills, using data from the 1987 and 1990 National Longitudinal Transitional Study, sponsored by the US Department of Education. Results indicate that greater inclusion in regular education environments yields a higher likelihood of graduation and independent living, but has no relationship with post-graduation socialization or participation in a productive activity after high school (e.g., employment, post-secondary education, GED courses).
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INTRODUCTION

The appropriate setting for educating students with disabilities has been the subject of a lively debate for at least several decades. Special education was originally developed to address the perceived inadequacies of the general education curriculum, but in the latter part of the 20th century, students with disabilities began to be mainstreamed back into general education settings as part of the movement to deinstitutionalize people with disabilities in both residential and educational settings (Hebbeler, 1993). The debate today has become even more nuanced, with some advocates urging the adoption of a “full inclusion” model, which would include all students, regardless of disability, into general education classrooms and curriculum without any of the more traditional “pull-out” special education resources (i.e., students being removed for special instruction). This full inclusion model typically relies on team teaching approaches and a very rich staffing pattern, with several different teachers involved in educating each student. Other advocates acknowledge the benefits of such fully integrated settings, but argue that students with certain severe disabilities still need the increased attention and expertise that special education can provide; they advocate that students be mainstreamed as much as possible but not be educated exclusively in general education settings.

The Individuals with Disabilities Education Act (IDEA), originally passed as the Education of All Handicapped Children Act in 19751 and amended in 19972 and 2004,3 ensures every child a “free appropriate public education” (FAPE) and requires that students be educated in the “least restrictive environment” (LRE). Under IDEA, FAPE

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1 Public Law 94-142  
2 Public Law 105-17  
3 Public Law 108-446
refers to special education services that are provided at public expense in conformity with an Individual Educational Program (IEP), the statement outlining the services that will be provided to meet the student’s needs. The requirement of education in the LRE is contained in the statement that "to the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are educated with children who are not disabled, and that special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only when the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily."5

The underlying policy goal is to allow students with disabilities to participate in education with their peers in a regular educational environment to the greatest extent possible (Committee on Education and the Workforce, 2005). While emphasizing the importance of such integration, this focus on the “least restrictive environment” acknowledges that there are cases when general education is not appropriate, and requires that schools have a complete spectrum of alternative educational placements available.

What is considered to be the “appropriate” and “least restrictive” environment is determined on an individual basis through the development of an Individual Educational Program, a statement of individual goals and plans that are the result of a collaboration between the student, parents, teachers, and other professional staff (e.g., counselors, psychologists, health specialists, occupational therapists). IEPs are intended to be

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4 20 U.S.C. § 1401(9).
developed with reference to the ability of the student to participate in the general
education curriculum,\(^6\) highlighting the underlying goal of the IDEA to educate students
with disabilities in the regular education environment to the maximum extent appropriate.
Although the IDEA does not give much guidance to IEP teams, a number of judicial
decisions have identified the following as factors to be considered among others: the
feasibility of providing services in a general education placement, the availability of
supplementary aids and services that can be provided in the general education classroom,
the educational benefit of each placement including non-academic benefits, and the
student’s disruptive behavior (Douvanis and Hulsey, 2002).

Although the presumption of placement in a regular education environment is
now a legal requirement, it is another matter whether this is justified empirically as an
effective educational strategy, particularly for those students with the most severe
disabilities. There are advocates on both sides of the issue, all of whom are concerned
about the best education for students with disabilities. Many disability rights advocates
argue that it is a fundamental human right to be treated like all other students and that
segregation is always inappropriate (TASH, 2005). On the other hand, others argue that
students with some disabilities are better served in settings that focus on their specialized
needs (Fuchs and Fuchs, 1994).

These disagreements arise for a number of reasons. First, different groups are
focusing on different outcomes. Some groups are concerned with social outcomes such
as a youth’s feeling of social belonging or ability to function comfortably in social

settings following school. Others are concerned with more academic outcomes, particularly test scores. And yet others are concerned with the development of independence in vocational, residential, and personal arenas so that the youth can function on their own as much as possible once they finish their education. But even when there is agreement on the desired outcomes, there can be disagreement on how best to achieve those goals. For example, everyone may agree that an appropriate education would prepare students for employment following graduation. However, some might argue that socialization opportunities with non-disabled peers is essential preparation, and urge full or near-full inclusion. Others might believe that learning discreet skills in preparation for a particular type of employment is more useful, and favor education in a separate setting where those skills can be acquired.

The reauthorization of IDEA in 2004 provided an opportunity for the education community to evaluate the “least restrictive environment” requirements and respond to any developments since 1997. Rather than modifying the substance of this requirement, the Conference Report (Committee on Education and the Workforce, 2004) emphasized the need for states to provide a continuum of placement options and to not encourage or discourage any particular type of placement (Consortium for Citizens with Disabilities, 2005). The reauthorization also increased the requirements for transition planning in the IEP process, indicating increased emphasis on the connection between secondary school placements and post-school outcomes (IBID.). In addition, there was significant debate surrounding the discipline of students with disabilities, particularly as it relates to their effect on their non-disabled peers (IBID.). This question is integrally related to students’
participation in general education curriculum. The increased interaction between students with and without disabilities has created a concern among general education teachers and administrators that these placements might cause disruptions that harm the educational environment for the non-disabled students.

Despite the policy relevance of the relationship between a student’s educational environment and post-school outcomes, there is a striking lack of quantitative research on the question. The success of the intervention, while normally a key factor in determining policy, seems to be absent from the discussion in this area of special education. To help fill this gap, this paper examines the effect of inclusion of high school students with disabilities in regular education environments on their subsequent high school graduation, post-graduation activities, residential independence, and social skills.

PREVIOUS RESEARCH

As noted, there is surprisingly little research regarding the impact of regular education placements for students with disabilities on their subsequent post-school outcomes (Zigmond, 2003). There are a number of case studies that look at individual programs and schools, with no ability to generalize to the populations at issue, and some authors have tried to combine these studies through meta-analysis to determine whether a significant effect does exist. For example, Baker (1994) found that there was a mild to moderate effect size for academic and social outcomes (an academic effect size of 0.08 and a social effect size of 0.28), while Carlberg and Kavale (1980) found that the effect differed depending on the nature of the student’s disability, i.e., there was a positive
effect for students with below normal IQ, but a negative effect for students with emotional, behavioral, and learning disorders.

The National Longitudinal Transition Study (NLTS) provided the first real opportunity to conduct nationally representative quantitative research regarding the effectiveness of inclusion practices. However, only two studies have addressed this question using the NLTS. Hebbeler (1993) looked at the impact of regular education on post-school outcomes focusing on four different disability clusters (mild, moderate, sensory, and severe), and found that greater time spent in regular education was positively related to employment and social outcomes, but there was no significant relationship with independent living. Wagner (1996) also used the NLTS data to look at post-school outcomes, controlling for whether the student completed secondary school, and found that more time spent in regular education was positively related to both employment and community participation.

Although Wagner and Hebbeler make great contributions to the knowledge base regarding the effects of inclusion on post-school outcomes, the portions of their research devoted to post-school outcomes are small. Their findings are reported as part of larger analyses of the NLTS data, and do not thoroughly explain what factors were controlled for, or what methods were used to arrive at their conclusions. This information was included in Hebbeler’s research on the relationship between regular education and post-graduate employment. However, she defined employment as a competitive job outside the home for which the youth was being paid (Hebbeler, 1993). This definition does not allow for other productive activities the youth might choose to take part in, such as
supported or volunteer work, job-skills training, or GED courses. Accordingly, this study will use the outcome “productive activity” rather than competitive employment.

**ANALYSIS METHODS**

Post-school outcomes for students with disabilities are the result of a complex relationship among a variety of different factors. Some of these, such as family background (e.g., income, race, structure) and a child’s innate characteristics (e.g., disability, IQ), are certainly important determinants. But, the focus in this analysis are the child’s educational experiences and how these can affect what happens to children with disabilities as they leave high school. Specifically, this paper hypothesizes that educational placement, determined in part by a child’s characteristics and prior educational experience, is an important factor influencing post-school outcomes. Using logistic regression analysis, the paper examines the relationship between school placement and important post-school outcomes, controlling for individual, family, and school characteristics.

The general form of the model is:

\[ Y_i^T = B_0 + B_1(Placement_i^{T-1}) + B_2X_{i1}^{T-1} + B_3X_{i2}^{T-1} + \ldots + e \]

where \( Y \) is a particular post-school outcome, \( Placement \) is a measure of the student’s inclusion in regular education while in high school, and the \( X \)'s are a set of child and family level background variables, including the severity of the child’s disability, all measured during high school. The variables used in the analysis are discussed below in the section on Data Sources.


Data Sources

The data set used for this analysis is the National Longitudinal Transition Study (NLTS). The NLTS, mandated by Congress in 1983, tracked over 8,000 students with disabilities in the United States, collecting data in 1987 and 1990. All independent variables and covariates were taken from Wave 1 of the NLTS, collected in 1987 when the students were in high school, while the measures of post-school outcomes (i.e., the dependent variables) were taken from Wave 2, collected in 1990 when the students were out of school. The NLTS variables that are of interest to this analysis are described below with statistics presented in Table 1.

The four dependent variables of interest, chosen to evaluate different goals of inclusion relating to academic, personal, vocational, and socialization outcomes, are as follows:

- **Graduation from High School (GRADUATE90):** measures whether the student had graduated from high school in 1990. This variable is equal to one if the student graduated, and equal to zero if the student had not. Students who aged out, dropped out, or were suspended or expelled were considered to have not graduated. Of the full sample, 68.8 percent had graduated by 1990. The unweighted sample size for this model is 1888 students.

- **Socialization (SOCIAL):** measures “how often youth sees friends.” If youth saw their friends more than once a week, this variable is equal to one, and if they saw friends once a week or less it is equal to zero. The mean value of this variable is 0.658, and the unweighted sample size for this regression is 1752 students.
- **Independent Living (LIVEIND):** measures whether the “youth is living independently,” a dichotomous variable derived from the parent/youth interview. It is equal to one if the youth is living independently and zero if the youth is living with their parents or in an institution of any form. In 1990, 26.2 percent of students in this study were living independently. The unweighted sample size for this regression is 1869 students.
### Table I: Descriptive Statistics of High School Students with Disabilities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Valid N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>St. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate</td>
<td>Youth graduated from high school in 1990</td>
<td>7046</td>
<td>0</td>
<td>1</td>
<td>0.69</td>
<td>0.46</td>
</tr>
<tr>
<td>Social</td>
<td>Student socialized with friends more than once per week in 1990</td>
<td>5910</td>
<td>0</td>
<td>1</td>
<td>0.66</td>
<td>0.47</td>
</tr>
<tr>
<td>LiveInd</td>
<td>Youth lived independently in 1990</td>
<td>6562</td>
<td>0</td>
<td>1</td>
<td>0.26</td>
<td>0.44</td>
</tr>
<tr>
<td>Productive Activity</td>
<td>Youth was engaged in a productive activity in 1990</td>
<td>4861</td>
<td>0</td>
<td>1</td>
<td>0.75</td>
<td>0.43</td>
</tr>
<tr>
<td>Percent Regular</td>
<td>Percent time spent in regular education</td>
<td>5784</td>
<td>0</td>
<td>100</td>
<td>43.15</td>
<td>40.18</td>
</tr>
<tr>
<td>Severe</td>
<td>Student’s primary disability is severe</td>
<td>8389</td>
<td>0</td>
<td>1</td>
<td>0.17</td>
<td>0.38</td>
</tr>
<tr>
<td>Other Severe</td>
<td>Student’s primary disability is blind, deaf, or both</td>
<td>8389</td>
<td>0</td>
<td>1</td>
<td>0.12</td>
<td>0.33</td>
</tr>
<tr>
<td>Not Severe</td>
<td>Student’s primary disability is not severe</td>
<td>8389</td>
<td>0</td>
<td>1</td>
<td>0.70</td>
<td>0.46</td>
</tr>
<tr>
<td>IQ</td>
<td>Student’s IQ</td>
<td>4383</td>
<td>1</td>
<td>145</td>
<td>78.15</td>
<td>23.27</td>
</tr>
<tr>
<td>Self-Care Skills</td>
<td>Ability of student to dress, feed, and go out of the home by themselves</td>
<td>6731</td>
<td>3</td>
<td>12</td>
<td>11.00</td>
<td>2.01</td>
</tr>
<tr>
<td>Female</td>
<td>Student’s gender is female</td>
<td>8407</td>
<td>0</td>
<td>1</td>
<td>0.61</td>
<td>0.49</td>
</tr>
<tr>
<td>White</td>
<td>Student identifies as White, not Hispanic</td>
<td>7574</td>
<td>0</td>
<td>1</td>
<td>0.62</td>
<td>0.48</td>
</tr>
<tr>
<td>Parents</td>
<td>Number of parents in the student’s household</td>
<td>6694</td>
<td>1</td>
<td>2</td>
<td>1.66</td>
<td>0.47</td>
</tr>
<tr>
<td>Outside Family</td>
<td>Student lived outside their family in 1987</td>
<td>5756</td>
<td>0</td>
<td>1</td>
<td>0.11</td>
<td>0.32</td>
</tr>
<tr>
<td>Other</td>
<td>Student lived in some other setting in 1987</td>
<td>5756</td>
<td>0</td>
<td>1</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Income over 12</td>
<td>Family income in 1987 over $12,000</td>
<td>6023</td>
<td>0</td>
<td>1</td>
<td>0.74</td>
<td>0.44</td>
</tr>
<tr>
<td>Poor School</td>
<td>Student attended a high poverty school</td>
<td>6533</td>
<td>0</td>
<td>1</td>
<td>0.25</td>
<td>0.44</td>
</tr>
<tr>
<td>Voc-ed</td>
<td>Number of hours of voc-ed received in high-school</td>
<td>7454</td>
<td>0</td>
<td>1440</td>
<td>143.91</td>
<td>196.72</td>
</tr>
<tr>
<td>Transition</td>
<td>Program is available to assist students in planning transition to adulthood</td>
<td>5311</td>
<td>0</td>
<td>1</td>
<td>0.20</td>
<td>0.40</td>
</tr>
</tbody>
</table>

*Source: National Longitudinal Transition Study, 1987 and 1990*
Productive Activity (PRODUCTIVE ACT): measures “whether youth is productively engaged,” as determined from the parent/youth survey. This is also a dichotomous variable, equal to one if the student is engaged in productive activity. Productive activities are defined as employment, post-secondary education, GED courses, and job-skills training. The mean for the full sample is 0.75, and the unweighted sample size for this regression is 1712 students.

The same model was used to estimate the effect for each post-school outcome, with the exception of the model for high school graduation, for which the variables about the vocational or transitional programs offered by the school were deleted, and the model for socialization, for which the vocational education variable was deleted. This is because the presence or absence of these programs should have little impact on the student’s ability to achieve the particular post-school outcome. These programs should affect other post-school outcomes, however, so they are included in the other models. The sample size for each regression varies as noted above, and is defined by the observations available for both the dependent variable and the educational placement variable.

The intervention of interest, participation in regular education (PCTREG), is measured as “percent of youth’s time spent in regular education for the academic year,” as derived from school transcript data. This coefficient tests the hypothesis that increasing inclusion in regular education improves the relevant post-school outcome. The mean percentage of time spent in regular education environments is 43.2 percent.

Covariates used in the four different models are of three different types: individual, family, and school level characteristics. The individual-level characteristics
that are expected to contribute to post-school outcomes independently of inclusion are the severity of the child’s disability, his/her IQ, and his/her self-care skills in 1987, as well as the child’s gender and ethnicity. Disability, IQ, and self-care skills control for the fact that some students have a higher ability level than other students which would presumably lead, in general, to greater success following high school. Gender and ethnicity, while ideally not factors in a student’s success, are often considered to be relevant nonetheless (Hebbeler, 1993). The specific variables used are as follows:

- **Student Disability:** Students’ disabilities are divided into three categories, with dichotomous variables for two of the categories used in the model:
  - SEVERE is equal to one for any students with moderate or severe mental retardation, aphasia, severe emotional disabilities, autism, or multiple disabilities. These are the students who seem least likely to succeed in a general education placement. Of all students in the sample, 17.2 percent have severe disabilities.
  - OTHERSEVERE is equal to one for students who are blind, deaf, or blind and deaf. These are students who face extreme obstacles in integrating into a general education placement, but once integrated, appear to have a higher likelihood of benefiting from that placement. In other words, they don’t have disabilities which would directly affect their ability to learn, as long as they were provided with the proper adaptive tools. Of students in the sample, 12.4 percent have these categories of disabilities.
The excluded category is NOT SEVERE, or mild disabilities, which includes learning disabilities, orthopedic impairments, speech or language disabilities, and mild forms of mental retardation or emotional disabilities.

- **Student IQ (IQ):** is equal to the youth’s score on any IQ test they have taken. The average IQ for students in this study is 78.2.

- **Self-Care Ability (SELF CARE):** is an ability scale that runs from 1 to 12, measuring the ability of the youth, while they were a student, to dress, feed, and go out of the home on their own. The average score on this scale is 11.

- **Gender (GENDER):** is equal to one if female, zero if male, using information provided by the parent, or if missing, by the school district. Of all students for which there are data, 61.2 percent are female.

- **Race (WHITE):** refers to the ethnicity of the student, as described by either the parent or school district. It is equal to one if the student is identified as white non-Hispanic and zero if the student is identified as any other race/ethnicity. Of the students in this sample, 62.4 percent are white.

Family characteristics that might also affect post-school outcomes, and therefore need to be included as covariates in the model, are family income, whether the family is a one or two parent household, and where the student lives. These are important variables to control for because a family’s resources and the number of parents in the household are considered to be significant factors in the youth’s success (Hebbeler, 1993), and whether a student lives at home, in an institution, or in a correctional institution, for example, will probably impact the level of support they have during their education.
Specifically, it seems likely that students who live with their families will have more personalized attention at home which should improve their success in various outcomes, and students whose families are able to give them more assistance, either because there are more parents in the home or more resources at the family’s disposal, are also more likely to succeed. The variables used are as follows:

- **Parents in the Home (PARENTS):** is defined as the number of parents in the youth’s household.

- **Living Outside the Home (OUTSIDE FAMILY):** is equal to 1 for all students who lived outside their family home in 1987 (88.7 percent of the sample), including students who lived independently or in supervised settings such as group homes and correctional facilities. It is equal to zero if the student lived with their family.

- **Household Income (INCOMEOVER12):** is a dichotomous variable equal to one if the family’s income in 1987 was over $12,000, and equal to zero otherwise. This variable was created from family income data that were collected in overlapping categories.

  Finally, there are four variables describing the student’s high school experience that were included as additional covariates because of their expected relationship to student outcomes independent of placement in regular education classes:

- **School Poverty (POOR SCHOOL):** indicates the level of poverty at the school the student attended. This variable is equal to one for schools where the percentage of students at the school who are considered low-income is over 50 percent — 25.4 percent of students in this sample attended poor schools.
- **Vocational Education (VOCED):** is the number of hours the youth spent in vocational education during high school. This variable ranges from 0 to 1440, with a mean of 143.9 hours.

- **Transition Services (TRANSITION):** is equal to one if the school offered transition planning to its students with disabilities, and zero if it did not. Of the students in the study, 19.9 percent had transition services available to them.

**Weights**

The NLTS involved the selection of a national probability sample of school districts, and then a probability sample of students with disabilities who were in grades 7 through 12 (or whose birthdays were in or before 1972) in 1985-86 using rosters provided by the school districts. The data that were subsequently collected were weighted to represent the U.S. population of students in special education in the 1985-86 school year who were in grades 7 through 12 or at least 13 years old. Because data could not be collected from all sampled students, the weights also include adjustments for non-response. As a consequence, all of the analyses were conducted using the NLTS sampling weights, specifically the “Postschool Outcomes Wave 2” Weight.7

**Missing Data**

Regressions were only run where both the dependent variable and the weight had valid observations. To keep observations that had missing data for the independent

7 The weight was divided by its mean because SAS does not properly use weights in logistic regressions; this adjustment normalized the weights to sum to one.
variables within the regression model, missing data points were set to the lowest value of the variable and individual dummy variables were created to indicate missing data for these cases. The dummy variables were then included in the model to indicate which cases had missing data. There was no missing data for “female” where both the weight and dependent variable had valid data, and the missing data were identical for “severe” and “other severe,” so “female” and “other severe” are the only independent variables that don’t have corresponding dummy variables.

RESULTS

Results from the logistic regression analyses are presented in Table II, with separate columns for each of the four outcome measures. The signs on the coefficients are generally as expected, indicating that the model specification is working as anticipated.

The results indicate that the percent of time that students with disabilities spent in regular education is significantly related to two of the four post-school outcomes: graduation and independent living. The relationship between educational placement and the other two post-school outcomes, socialization and participation in a productive activity, were not statistically significant (i.e., could not be distinguished from zero).

The analysis indicates that the more time a student spends in regular education, the more likely that student is to graduate (p = 0.07). A 10 percent increase in the percent of time spent in regular education increases the odds of graduation by about four percent controlling for other variables in the model. Similarly, students who spend a greater
amount of time in regular education are more likely to live independently after high school \((p < 0.0001)\). A 10 percent increase in time spent in regular education increases the odds of independent living by approximately 12 percent, controlling for the covariates.

There were a few important findings with respect to the covariate coefficients. Surprisingly, students with severe disabilities were more likely to graduate \((p = 0.02)\) than students whose disability is categorized as “not severe,” i.e., students with learning disabilities, orthopedic impairments, speech or language disabilities, and mild forms of mental retardation or emotional disabilities. The odds of a student with a severe disability graduating from high school is 1.7 times the odds that of student with a non-severe disability will graduate. In addition, gender and race/ethnicity appear to play a large role in determining post-school outcomes, as gender was significant in every model, and race/ethnicity was meaningful in three out of four models.

**DISCUSSION**

The analysis has identified two outcomes, graduation and independent living, that can be seen as benefits of the inclusion of students with disabilities in regular education environments. This is important because it supports the argument made by disability advocates, often made in the past without the support of quantitative evidence. It also reflects the current presumption in the law that students should be educated in regular education environments when it is appropriate.
Table II: Logistic Regression Estimates (Ind Var: Regular Ed)

<table>
<thead>
<tr>
<th></th>
<th>Graduate</th>
<th>Social</th>
<th>IndLiv</th>
<th>ProductiveAct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.307 (0.880)</td>
<td>-1.890** (0.749)</td>
<td>-6.210*** (1.354)</td>
<td>-1.860** (0.834)</td>
</tr>
<tr>
<td>Percent Regular</td>
<td>0.004* (0.002)</td>
<td>0.001 (0.002)</td>
<td>1.354*** (0.749)</td>
<td>0.003 (0.003)</td>
</tr>
<tr>
<td>Percent Regular Missing</td>
<td>0.634** (0.239)</td>
<td>0.158 (0.234)</td>
<td>0.432* (0.260)</td>
<td>0.552** (0.271)</td>
</tr>
<tr>
<td>IQ</td>
<td>0.005 (0.005)</td>
<td>0.001 (0.004)</td>
<td>0.016** (0.005)</td>
<td>0.005 (0.005)</td>
</tr>
<tr>
<td>IQ Missing</td>
<td>0.373 (0.415)</td>
<td>0.430 (0.393)</td>
<td>1.387** (0.441)</td>
<td>0.016 (0.466)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.248* (0.130)</td>
<td>0.336** (0.121)</td>
<td>-0.554*** (0.122)</td>
<td>0.560*** (0.139)</td>
</tr>
<tr>
<td>Parents</td>
<td>0.706*** (0.134)</td>
<td>0.123 (0.134)</td>
<td>-0.030 (0.140)</td>
<td>0.463** (0.151)</td>
</tr>
<tr>
<td>Parents Missing</td>
<td>0.772 (0.502)</td>
<td>1.018** (0.481)</td>
<td>-0.414 (0.457)</td>
<td>0.840 (0.576)</td>
</tr>
<tr>
<td>Voc Ed</td>
<td>0.0007** (0.0003)</td>
<td>-0.0006 (0.0004)</td>
<td>0.014 (0.141)</td>
<td>0.348 (0.259)</td>
</tr>
<tr>
<td>Voc Ed Missing</td>
<td>0.141 (0.259)</td>
<td>0.348 (0.300)</td>
<td>0.516** (0.237)</td>
<td>0.113* (0.063)</td>
</tr>
<tr>
<td>Transition</td>
<td>0.352* (0.195)</td>
<td>-0.164 (0.190)</td>
<td>0.516** (0.237)</td>
<td>0.113* (0.063)</td>
</tr>
<tr>
<td>Transition Missing</td>
<td>0.280* (0.157)</td>
<td>-0.450** (0.159)</td>
<td>-0.357** (0.170)</td>
<td>0.113* (0.063)</td>
</tr>
<tr>
<td>Self Care Skills</td>
<td>-0.016 (0.070)</td>
<td>0.150** (0.058)</td>
<td>0.270** (0.110)</td>
<td>0.113* (0.063)</td>
</tr>
<tr>
<td>Self Care Skills Missing</td>
<td>-0.388 (0.711)</td>
<td>0.376 (0.608)</td>
<td>3.533** (1.027)</td>
<td>1.735** (0.716)</td>
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<tr>
<td>Severe</td>
<td>0.538** (0.227)</td>
<td>-0.246 (0.200)</td>
<td>-0.405 (0.265)</td>
<td>-0.252 (0.240)</td>
</tr>
<tr>
<td>Severe Missing</td>
<td>-0.386 (2.080)</td>
<td>-0.967 (2.189)</td>
<td>-0.197 (2.141)</td>
<td>-0.320 (2.158)</td>
</tr>
<tr>
<td>Other Severe</td>
<td>0.935 (0.629)</td>
<td>0.130 (0.519)</td>
<td>0.259 (0.539)</td>
<td>-0.233 (0.553)</td>
</tr>
<tr>
<td>Income over 12</td>
<td>0.028 (0.139)</td>
<td>0.263* (0.136)</td>
<td>0.355** (0.146)</td>
<td>0.174 (0.157)</td>
</tr>
<tr>
<td>Income over 12 Missing</td>
<td>0.269 (0.224)</td>
<td>-0.048 (0.203)</td>
<td>-0.268 (0.237)</td>
<td>-0.127 (0.237)</td>
</tr>
<tr>
<td>White</td>
<td>0.212 (0.133)</td>
<td>0.563*** (0.128)</td>
<td>0.274** (0.135)</td>
<td>0.684*** (0.147)</td>
</tr>
<tr>
<td>White Missing</td>
<td>-0.270 (0.573)</td>
<td>0.838 (0.586)</td>
<td>0.675 (0.520)</td>
<td>0.658 (1.107)</td>
</tr>
<tr>
<td>Poor School</td>
<td>-0.246 (0.161)</td>
<td>-0.663*** (0.150)</td>
<td>-0.113 (0.173)</td>
<td>-0.357** (0.177)</td>
</tr>
</tbody>
</table>
These results are, however, **not** consistent with prior research done using the NLTS. Hebbeler (1993) and Wagner (1996) found positive and significant relationships between inclusion in regular education and employment outcomes, compared to the findings here that the two are unrelated. Hebbeler also found that social outcomes were affected by participation in regular education, but that independent living was not. Again, this is the opposite of what was found here, that social outcomes were not related to inclusion in regular education, but that independent living and regular education were highly correlated. This difference may be due to different covariates in the models, but as Hebbeler and Wagner do not fully describe their models, it is difficult to know is this is the case.

What is somewhat surprising is that socialization was not significantly improved as a result of greater inclusion in regular education. Improvement in social skills is one outcome that is often assumed to be a benefit of interacting with non-disabled peers on a daily basis. The failure to find a significant relationship may be due in part to the way the variable was defined. If the variable were defined in such a way as to measure improvement in social skills, or more accurately measured skills in a given social

<table>
<thead>
<tr>
<th></th>
<th>Graduate</th>
<th>Social</th>
<th>IndLiv</th>
<th>ProductiveAct</th>
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<tr>
<td>Poor School Missing</td>
<td>-0.429**</td>
<td>-0.315</td>
<td>-0.0065</td>
<td>-0.026</td>
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<tr>
<td></td>
<td>(0.192)</td>
<td>(0.221)</td>
<td>(0.232)</td>
<td>(0.236)</td>
</tr>
<tr>
<td>Outside Family</td>
<td>-0.597</td>
<td>-0.567</td>
<td>1.587***</td>
<td>-0.711</td>
</tr>
<tr>
<td></td>
<td>(0.413)</td>
<td>(0.405)</td>
<td>(0.385)</td>
<td>(0.468)</td>
</tr>
<tr>
<td>Outside Family Missing</td>
<td>-0.301</td>
<td>0.226</td>
<td>0.047</td>
<td>-1.086</td>
</tr>
<tr>
<td></td>
<td>(0.556)</td>
<td>(0.562)</td>
<td>(0.500)</td>
<td>(0.707)</td>
</tr>
<tr>
<td>N</td>
<td>1888</td>
<td>1752</td>
<td>1869</td>
<td>1712</td>
</tr>
</tbody>
</table>

* p < 0.10; ** p<0.05; *** p <0.0001
environment rather than the number of times the youth saw their friends, it might yield different results.

It is not as unexpected that involvement in a productive activity was not related to participation in regular education. Students who spend a lot of time in specialized instruction are more likely to be specifically prepared for tasks that are appropriate for their disability, which might better prepare them to find a job or post-secondary activity. On the other hand, regular education might provide the skills needed by most post-secondary education and employment programs. It is understandable that there is no clear relationship between the policy and productive activity outcome.

One surprising result with regard to the covariates was that students with severe disabilities were more likely than their peers to graduate. The logical assumption is that students with severe disabilities would have a harder time meeting the graduation requirements and would therefore be less likely to graduate. The relationship may be a result of school policies that don’t place as many requirements on students with severe disabilities in order to advance from one grade level to the next. Students with the most severe disabilities simply advance from grade to grade every year because they are deemed unable to meet any of the stated graduation requirements.

Another important result is the consistent relevance of gender and ethnicity. Gender was significant in every model, and ethnicity was significant in all models except graduation. Although the role of these variables is beyond the scope of this paper, it is nonetheless an important policy result and leads to questions about how students with disabilities might be treated differently based on their race or gender.
CONCLUSIONS

The results indicate that greater inclusion of students with disabilities in regular education environments yields a higher likelihood of graduation and independent living, but has no relation to post-graduation socialization or participation in a productive activity. This generally supports the continued use of the IDEA presumption that all students be included to greatest extent appropriate.

But because the results are not consistent with the limited prior research, and because the implications of this research are far-reaching with regard to the education of students with disabilities, there needs to be far more research in this area of education. The US Department of Education is in the process of collecting a second round of the NLTS (NLTS 2), looking at students who were in high school in 2000. Data will be collected over ten years. This data set is an excellent opportunity to take another look at the impact of high school placement decisions on students with disabilities. For students with disabilities, the IDEA governs every aspect of education, and it is unwise and irresponsible to have such a comprehensive policy in place without ongoing quantitative evaluation.
REFERENCES


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