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High School Dropout Determinants: The Effect of Poverty and Learning Disabilities

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Abstract

Numerous studies have found determinants of high school completion; most studies focus on socioeconomic and academic performance factors. This research aims to study the impact of socioeconomic status and learning disabilities, specifically the impact that socioeconomic status has on the prevalence of learning disabilities, and then the impact learning disabilities has on high school completion. Moreover, this study aims to determine if an interaction between these two factors exists, thereby causing an increased disadvantage of attaining a high school education for these students possessing both of these characteristics. Additionally, this study will show the effectiveness of the current efforts towards helping these students facing poverty and/or learning disabilities.

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I. Introduction

Child Trends Data Bank reports that for the year 2003 the high school dropout rate was 10%. Considering the growing importance of higher education, one might wonder why some students still opt to drop out of high school. Perhaps this phenomenon is merely a selection process, for Eckstein found that dropouts have a competitive advantage in jobs not requiring a high school diploma (1999). Moreover, assuming choices are not constrained, Human Capital Theory suggests that these students determine that the cost of lost wages exceeds the gain received by investing in a high school diploma. However, instances arise when students are forced out of high school due to poor grades or bad behavior.

Until this time, the United States' labor market has incorporated these lower skilled workers, but today the U.S. faces a new challenge of increasing global competition and a loss of jobs, especially lower skilled jobs, to less expensive overseas operations. If this trend continues, the outlook for these high school dropouts appears to be bleak. Therefore, today society needs to stress the importance of education, and by studying the determinants of dropping out of high school, society can target the students most inclined to drop out and hopefully improve their chances of economic success in the future by encouraging them to complete high school.

Numerous studies have found determinants of high school completion; most studies focus on socioeconomic and academic performance factors. This research aims to study the impact of socioeconomic status and learning disabilities, specifically the impact that socioeconomic status has on the prevalence of learning disabilities, and then the impact learning disabilities has on high school completion. Moreover, this study aims to determine if an interaction between these two factors exists, thereby causing an increased disadvantage of attaining a high school education for these students possessing both of these characteristics. Additionally, this study will show the effectiveness of the current efforts towards helping these students facing poverty and/or learning disabilities.

II. Literature Review

Considering the importance of educational attainment to society, researchers have conducted many studies focusing on this issue. In 1962, Bertrand studied the social interaction between the family and the school social systems and its effect on high school dropouts. The most important determinants of high school dropouts that he found follow:

1. Low socioeconomic status directly correlates with high school dropouts.
2. Students of parents with lower educational attainment are more likely not to complete high school.
3. Parents who place a low value on a high school education transfer this low value to their children, thereby increasing their chances of dropping out of high school.
4. Students who have lower GPAs and who have failed more classes possess a higher chance of dropping out of high school.
5. Students incompatible with the school

> social system tend to receive more ridicule from students and punishment from teachers and consequently drop out of high school at a higher rate. (Alvin Bertrand 1962)

The main finding centered on the effect that dysfunctions between family and school social structures cause. When they contradict each other, students aim to fit-in with their family social structure rather than their school social system, thereby affecting their decision to stay in school (Bertrand 1962).

Bertrand's findings prove useful in my study by showing the impact that socioeconomic status (SES) and the accompanied challenges that students face have on high school completion. Additionally, he stresses the impact of social structures leading me to hypothesize that low SES and learning disabilities may cause a student not to "fit-in" to the school social system, thereby increasing the likeliness of that student dropping out of high school.

In 2003, Coleman and DeLeire investigated the effect that locus of control has on a student's decision to complete high school. They found that students with external locus of control place a lower value on a high school education and therefore tend to drop out of high school more often than students with an internal locus of control (Margo Coleman and Thomas DeLeire 2003). This finding follows the Human Capital Theory which suggests that students with external locus of control are more likely to drop out of high school because they underestimate their earnings potential and therefore determine that the cost of lost wages exceeds the gain received by investing in a high school diploma (place a lower value on a high school education).

Similar to Bertrand's findings of parental values transferring to their children, studies show that parents affect their children's locus of control because nurturing, encouraging parents tend to raise children with internal locus of control. More specifically, "parental involvement, family environment, teacher warmth, and academic performance help determine the development of internal locus of control" (Coleman and DeLeire 2003). The common bond between these factors that influence locus of control development is harmony between the family and school social systems which is outlined in Bertrand's study, thereby suggesting students with external locus of control tend not to "fit-in" with both of these social structures which leads to higher dropout rates.

Coleman and DeLeire believed that students who experienced stressful events, especially during their youth, were more likely to have an external locus of control (2003). One might deem it reasonable to assume that students coming from a low social class and/or facing a learning disability would also face stressful events in their life perhaps leading them to miscalculate the value of a high school education.

Dunn, Chambers, and Rabren in 2004 conducted a study that helps to strengthen the validity of the findings of the previously discussed studies through dropout interviews establishing the factors that would have convinced them to stay in school:

> 68% of the [dropouts interviewed] felt that there were changes that could have been made that would have helped them stay in school. These included changes in (a) attitudes and effort, (b) school attendance policies, (c) teacher behavior, (d) discipline policy, and (e) peers. (Caroline Dunn, Dalee Chambers and Karen Rabren 2004)

Additionally, students also claimed that they were more likely to stay in school if they believed that they were being effectively prepared for their future career plans which follow Human Capital Theory perfectly (Dunn, Chambers, and Rabren 2004).

The previous two studies discussed have established the impact of SES, family background, social structures, and educational performance on high school completion. Not only does Dunn, Chambers, and Rabren's study reinforce these findings, but also explores the impact that

disabilities have on students and their decision to stay in school. They found that 58% of the students with learning disabilities and only 37% of the students with mental retardation were likely to drop out of high school (Dunn, Chambers, and Rabren 2004). These findings show that learning disabilities have an effect on high school completion.

My study aims to determine if a relationship exists between SES and learning disabilities; however, arguments can be made that this relationship may be either causal or selective. SES causes learning disabilities or learning disabilities create challenges that lead to a lower SES. Miech, Caspi, Moffitt, Wright, and Silva, in 1999, found that "mental disorders are overrepresented in the lower social strata," and therefore wanted to investigate this relationship between SES and mental disorders in order to determine the direction of the relationship (Richard Miech, Avshalom Caspi, Terrie Moffitt, Bradley Entner Wright and Phil Silva 1999). This study found that "adolescent mental disorders were more likely to be found among youth in families with low [socioeconomic status] SES than would be expected by chance alone" (Miech et al. 1999). These findings were especially robust for attention deficit disorder, a learning disability. Additionally, attention deficit disorder tends to affect educational attainment (Miech et al. 1999). Miech et al. suggests that SES and learning disabilities are correlated with data collected from New Zealand. My study aims to further this literature by determining if similar relationships exist in the United States.

III. Theory

According to Gary Becker's Human Capital Theory, wages differ because jobs differ and workers differ. Each worker brings a unique set of skills and abilities to the labor force (human capital) and therefore workers' human capital determines their compensation. Education, training, and medical treatment have been shown to contribute to the accumulation of human capital (George Borjas 2000). Therefore, according to this theory, investments in human capital increase the chances for economic success.

As mentioned earlier, the U.S. labor market demands fewer blue-collar workers due to the shift of jobs to other countries. Therefore, the U.S. labor force and future labor force needs to recognize the necessity for increased human capital in order to successfully compete in the labor force. Essentially, the completion of a high school degree becomes the first step in starting the process of increased human capital investment. By earning a high school degree, workers possess more skills that will help them either enter a higher level of education or better perform in the labor force.

Clearly, the Human Capital Theory emphasizes the importance of investment in human capital, such as a high school education, for economic success. This paper defines economic success as completing high school and therefore aims to determine the human capital investments that determine this "economic success." Since high school occurs during our youth, the majority of the human capital investments that would lead us to this achievement must be transferred from our parents to us. Therefore, our family socioeconomic class greatly impacts our human capital accumulation. Families from a lower socioeconomic class not only obtain less resources but also less human capital to pass onto their children, thereby causing these children to automatically be disadvantaged. Therefore, this paper hypothesizes that lower familial investment in children's human capital would increase the chances of these students dropping out of high school.

However, this paper also focuses on the challenge that students with learning disabilities face. Education exists as one of the critical components of human capital; therefore, one would assume that if students had a learning disability, this obstacle could deter them from achieving an increased level of human capital, such as a high school education. Moreover, this paper hypothesizes that learning disabilities

create extra barriers for students to overcome, and therefore increase the likeliness of them dropping out of high school.

Therefore, both lower socioeconomic status (SES) and learning disabilities can decrease the probability of high school completion. However, there could also be an interaction between SES and learning disabilities in determining high school completion because SES impacts the treatment and prevalence of a learning disability. First of all, parents from a lower socioeconomic class, most likely, have less human capital to use to help their children overcome a learning disability. Additionally, they also have fewer resources to use towards medical treatment. Therefore, this paper hypothesizes that the independent effects of low SES and learning disabilities are intensified when the student faces both challenges. Moreover, students with a learning disability from a lower socioeconomic class have an even greater chance of dropping out of high school than those students with learning disabilities from higher socioeconomic classes.

Essentially, following from the literature and the theory, this paper aims to research three hypotheses:

1. Lower SES increases the probability of dropping out of high school.
2. Learning disabilities increase the probability of dropping out of high school.
3. The interaction between lower SES and learning disabilities further increases the probability of dropping out of high school.

IV. Empirical Model

This study will use the National Longitudinal Survey of Youth (NLSY) 1997 Cohort to test the proposed hypotheses. As of December 31, 1996, the approximately 9,000 youth interviewed were between the ages of 12 and 16. For Round 1 of this longitudinal survey, both the youth and one of his/her parents were interviewed. Today, these youth are between the ages of 21 and 25; therefore, by this time, they have had ample time to complete high school if they opted to do so.

In order to determine if the youth dropped out of high school, I extracted the data revealing the highest grade completed as of the survey date in 2003, which places them between the ages of 19 and 23. By this time, the majority of the youth should have had time to complete high school; however, some cases may exist where youth were held back a year or more and may still be working on their high school degree. In these rare cases, the data will show them as dropouts when in actuality they are still students, thereby adversely affecting the results. The variable DO was created so that if the highest grade completed was below 12, DO = 1 and if it was equal to or greater than 12, DO = 0. Approximately 14.5 percent of the sample (1033 of 7110) dropped out of high school.

The first survey determined if the youth has or had a learning disability such as dyslexia or attention disorder that "limits or has limited the kind of schoolwork or other daily activities [he/she] can perform, the amount of time [he/she] can spend on these activities or [his/her] performance in these activities" (NLSY97 R06815). Moreover, if the youth suffers from such a condition, then LD = 1, and LD = 0 otherwise. Approximately 7 percent of the sample (499 of 7110) suffered from a learning disability.

Several factors influence socioeconomic status (SES) such as family income, parental education level, parental occupation, and social status in the community; however, this study uses the biological mother's highest completed grade to proxy this variable (Socioeconomic Status). Essentially, "women's educational attainment… influences women's occupations and earnings, which are themselves indicators of women's status. Also, it allows women to make better-informed decisions about affairs in their own household, their community, and their nation" (2006). Since educational attainment affects all factors of SES, this variable should be a good proxy for SES. Moreover, this study assumes that mothers with higher levels of education enjoy higher SES.

Lastly, the interaction variable was created

by multiplying the learning disability and the SES variable. See Table 1 for summary statistics concerning the average biological mother's highest completed grade for dropouts and graduates, along with the percentage of dropouts and graduates who face a learning disability. Table 1 shows that the dropouts from this sample tend to have mothers with less education, thereby suggesting they belong to a lower SES. Additionally, significantly more high school dropouts face a learning disability, compared to the graduates in the sample.

Table 1: Summary Statistics

	Average Mother's Education	Percent with LD	Average Mother's Education
Graduate	12.78	5.89%	-12.6622
Dropout	10.74	13.65%	-10.467

This study aims to determine the impact that socioeconomic status (SES), learning disabilities, and the interaction of these two variables have on high school achievement. The following formula will be used in order to test the hypotheses.

$$DO = \alpha_1 + \alpha_2(BMHGC) + \alpha_3(LD) + \alpha_4(BMHGC)(LD) + \varepsilon$$

Table 2 defines the variables and shows the expected signs.

Since the dependent variable (DO) is a dichotomous variable, the probit model will be used because this model better estimates the probability of an event than an OLS regression model.

Previous studies of high school completion tend to control for other variables in order to tease out the true effects of the variables in question—SES and learning disabilities specific to this study. These control variables can be grouped into two categories: background variables and educational variables. However, due to multicollinearity, I have decided to leave out a number of control variables that have been used in past studies such as race, students' school performance, and school attendance.

Most studies of high school completion control for parents' educational attainment. As Human Capital Theory suggests, people with less educational investment will not perform as well in the economy as those with more education. Additionally as Bertrand found, parents transfer educational values to their children (1962). Assuming that parents with lower educational attainment place a lower value on education, their children will also place a lower value on education and are therefore more likely to drop out of high school than children of high school graduates. While using the mother's educational attainment as a proxy for SES, I am also controlling for parents' educational attainment.

V. Results

The results originate from a probit analysis of a sample of 7110 youth. Not only was the regression equation significant, but also all of the variables were significant to at least the 0.01 level with the correct estimated sign. The results can be found in Table 3.

Table 2: Variable Definitions

Variable	Definition	Expected Sign
Dependent Variable		
DO	High School Dropout=1 High School Graduate=0	
Independent Variables		
BMHGC	Biological Mother's Highest Grade Completed (Proxy for SES)	(-)
LD	Student faces a Learning Disability=1	(+)
	Student does not face a Learning Disability=0	
BMHGCLD	Interaction between BMHGC and LD	(-)

In regards to the probit model, the higher the LR chi2 the more significant the overall model; therefore, with a LR chi2 of 519.19, this model predicts high school dropouts fairly accurately. All of the coefficients proved to be statistically significant with the hypothesized signs. By using the probit model with marginal effects, I determined that with each additional grade completed by the biological mother, the

student is 2.72% less likely to drop out of high school. Students who possess a learning disability are 47.70% more likely to drop out of high school. Additionally, with each additional grade completed by the biological mother, students facing learning disabilities are 1.46% less likely to drop out of high school. These marginal effects are figured holding all other variables constant.

Table 3: Results

DO	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
BMHGC	-0.1319	0.0069	-19.17	0.000***	-0.1454	-0.1184
LD	1.4595	0.3483	4.19	0.000***	0.7769	2.1421
BMHGCLD	-0.0708	0.0284	-2.49	0.013*	-0.1265	-0.0152
CONSTANT	0.4574	0.0816	5.6	0	0.2974	0.6174
n = 7110						
LR chi2 = 519.19						

*indicates significance at the 10% level
**indicates significance at the 5% level
***indicates significance at 1% level

Therefore, this study shows that higher SES (higher parental educational attainment) and dropping out of high school are significantly negatively correlated. This finding means that students from lower SES tend to drop out of high school more than students from higher SES. This finding also confirms Bertrand's findings that low SES is directly correlated and parents' education is inversely correlated with student dropouts.

Additionally, this study illustrates that learning disabilities and high school dropouts are significantly positively correlated. Therefore, students with learning disabilities drop out of high school more than students without learning disabilities, which was also determined in Dunn, Chambers, and Rabren's study.

The variable of most interest in this study is the interaction between these two variables. Do these students facing both low SES and learning disabilities have an increased chance of dropping out of high school? This study found this hypothesis to be true. Essentially, students from high SES with learning disabilities have an increased chance of graduating than those facing a lower SES and a learning disability, even after controlling for the independent effects of SES and LD. This finding establishes that a similar trend occurs in the United States as was found in New Zealand by Miech, Caspi, Moffitt, Wright, and Silva.

The confidence intervals further verify the robustness of the results. Not only are the variables significant according to the z statistic, but also the 95% confidence interval is narrowly focused in the correct direction.

VI. Conclusion

The results not only confirm pervious studies' findings but also verify the three-fold hypothesis established in this study that lower socioeconomic status (SES) and learning disabilities increases the probability of dropping out of high school along with an interaction of the two factors thereby intensifying the negative effect for students facing both challenges. Since this study shows that certain students face specific challenges which deter them from completing high school, perhaps these students can be better helped and encouraged to complete high school.

Several programs already exist attempting to aid students from lower SES; however, the government, schools, and other education promoting organizations can identify these students fairly easily. Determining students with learning disabilities is not as easy however. Therefore, by identifying characteristics of learning disabilities and distributing this information to schools and parents, perhaps these students can receive help earlier. Additionally, information concerning the treatments for these learning disabilities should be similarly distributed, especially to lower SES families. Assistance for these treatments should be given to lower SES families as well. Perhaps mentoring programs should be established for these lower SES students to not only give them good role models but also to educate them about their career options. Essentially, these students facing learning disabilities and/or low SES need

to be encouraged to stay in school and educated on the consequences of not graduating. Most importantly, those facing both learning disabilities and low SES should be the object of public policy because of their high risk of dropping out of high school.

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