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SUICIDAL BEHAVIOR AND THE LABOR MARKET PRODUCTIVITY OF YOUNG ADULTS

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ABSTRACT

This paper provides a comprehensive analysis of the link between suicidal behaviors and human capital formation of young adults in the United States. Using data from the National Longitudinal Study of Adolescent Health, we estimate the effects of suicide thoughts and attempts on the probability of engaging in work or school. The richness of the data set allows us to implement several strategies to control for unobserved heterogeneity and the potential reverse causality. These include using a large set of control variables that are likely to be correlated with both suicidal behavior and the outcome measures, an instrumental variables method, and a fixed effects analysis from the subsample of twin pairs contained in the data. The longitudinal nature of the data set also allows us to control for past suicidal thoughts and suicide attempts of the individuals from their high school years as well as the suicidal behavior of their family members. Results from the different identification strategies consistently indicate that both suicide thoughts and suicide attempts decrease the likelihood a young adult individual engages in work or schooling.

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I. Introduction

The suicide rate among youths has reached an alarming rate in recent years and is now the third leading cause of death for those aged 15-24 (Anderson and Smith 2003). Since 1950, the suicide rate has tripled among youths (Cutler et al. 2001). Even more striking is the number of suicide attempts by young individuals. For every teen that commits suicide, as many as 150 teens attempt suicide (Chatterji et al. 2004). Concern over the health and well-being of youths has prompted the U.S. Department of Health and Human Services (DHHS) to develop a national strategy for suicide prevention. This comprehensive campaign includes developing public education campaigns, increasing the number of suicide prevention programs in schools, work sites and community services, and incorporating screening at primary health care facilities.

Suicide attempts, regardless of whether or not they are completed, impose real health care and other costs on individuals and society. For example, the direct medical costs associated with both completed and medically treated suicides by youths under 21 amounted to $945 million in 1996, and lost future earnings are estimated at $2.85 billion (Miller et al. 1999). A suicide attempt can have adverse effects on one's current and future labor market productivity due to a bodily injury or permanent disability, lost credibility in the workplace, interruptions at work and school, lost interest in future employment efforts, and continuing psychological problems. Despite this strong link between suicidal behavior and labor market outcomes, our knowledge of the potential effects of suicidal behavior on labor market and school outcomes is very limited. This relationship is also confounded by the potential effects that poor school or labor market outcomes have in contributing to suicidal behaviors.

This paper explores in depth the link between suicidal behaviors and engaging in productive activities. Specifically, we focus on labor market and educational outcomes of young adults who are at a stage in life characterized by intense investment in human capital. These adults are in

school, participating in job training or are just starting their careers. Disruptions to these investments can have profound, long-term implications for future earnings and occupational choices. If there is a positive link between the quality of the initial job and future labor market success, the answer to this question will provide important insights into the long-term effects of suicidal behavior and will help structure a better-informed policy debate over the effectiveness of cognitive behavioral therapies and anti-suicide programs such as those implemented at high schools in the United States.

A study by the Centers for Disease Control and Prevention (1992) documents that most anti-suicide programs focus on teenagers with little emphasis given to suicide among young adults. This is partly due to the fact that teenagers in high school are easier to reach than young adults and partly due to a failure to appreciate that the suicide rate is generally twice as high among persons 20-24 years of age as among adolescents 15-19 years of age. The study recommends an expansion of the suicide prevention efforts for young adults 20-24 years of age.

The paper is organized as follows. Section II provides a summary of the previous evidence on the subject. Section III discusses the econometric methodology. Section IV introduces the data set and the variables used in the analyses. Section V summarizes the results. Section VI concludes the paper.

II. Background

Researchers believe that almost all individuals who commit suicide have a diagnosable mental disorder, and mental illnesses are also primary risk factors for suicide thoughts and attempts (Maris et al. 1992, Alexopoulos et al. 1999, Johnson et al. 1990). It has been estimated that two-thirds of people who commit suicide have a depressive illness; 5 percent suffer from schizophrenia; and 10 percent meet the criteria for other mental illnesses including borderline personality disorder.

The relationship between mental illness and suicidal behaviors also holds for youth (Fergusson and Woodward 2002). One estimate shows that over 90 percent of children and adolescents who commit suicide have a mental disorder (Shaffer and Craft 1999).

While depressive illnesses are most commonly associated with suicidal behaviors, other disorders are also frequently observed, including substance abuse disorders, attention deficit disorder, anxiety disorders, panic disorder, schizophrenic disorders, post-traumatic stress disorders, borderline personality disorders (Alexopoulos et al. 1999, Johnson et al. 1990, Goldsmith et al. 2002). For example, in a study of youth in a psychiatric hospital, Borst and Noam (1989) find that conduct disorders are the most prevalent type of disorders diagnosed among suicide attempters. The authors conclude, "factors such as impulsivity and anger may contribute significantly to suicidal behavior in children and adolescents." (p. 174) Personality disorders are also highly prevalent, with a diagnosis rate of 40 to 53 percent among youth who have committed suicide (Goldsmith et al. 2002).

It is important to note that the mental illnesses that manifest themselves through suicidal behaviors likely represent the most severe cases of illness. Simon and Von Korff (1998) find that among insured patients receiving treatment for depression, the highest risk of suicide was among those receiving inpatient treatment and medication and the lowest risk was found among individuals receiving outpatient treatment without medication.

Cutler et al. (2001) argue that there is a fundamental difference between suicide attempts and completions among youth, where the latter is a result of the desire to die and the former is not. The authors discuss four reasons for suicide attempts among youth: The first involves strategic motives to "…signal others that they are unhappy or to punish others for their unhappiness." (p. 233). The second is the depression theory where youths cross some unhappiness threshold and desire to take their own lives. The third is the contagion theory where a "'social multiplier' may

amplify the effects of stressors leading to depression or may amplify the effects of factors leading to suicidal signaling as a method of conflict resolution among youths." (p. 233-234). The fourth theory involves the combination of unhappiness and the means to kill themselves. Even in the absence of the intent to die, it is clear that underlying mental states are extremely important in the theories predicting suicidal behaviors.

In contrast to the conclusions drawn by Culter et al., Boergers et al. (1998) find that most adolescents who attempt suicides cite the reasons of wanting to die or to get relief from a terrible state of mind as the primary reason for the attempt. Few identify the attempt as a cry for help or a way of getting back at someone. Although it is difficult to pinpoint the exact underlying motives for a suicide thought or attempt, the link between suicide and mental illness cannot be denied.

Suicidal behaviors and the underlying mental illness may influence labor market and schooling outcomes through direct and indirect channels. The direct mechanism may work through suicidal behavior causing lower engagement in work and schooling activities due to reduced concentration and cognitive abilities (Greenberg et al. 1990, Conti and Burton 1994). Injuries from failed suicide attempts may also contribute absenteeism and reduced productivity at work and school. About 116,000 individuals who survive a suicide attempt are hospitalized with an average hospital stay of ten days and an average cost of $15,000 (Miller 1995). Seventeen percent of these people are permanently disabled and restricted in their ability to work (Miller 1995).

The indirect mechanism may work through mental illness which may, for example, contribute to teenage pregnancy and marital instability, or may lead to low educational attainment, poor labor market productivity and lower wages (Kessler et al. 1997, Overbeek et al. 2003). Whether direct or indirect, suicidal behaviors can affect an individual's productivity which may have consequences for wages and earnings. If a positive link exists between the quality of a job

early in adulthood and future labor market success, suicidal behaviors in early adulthood can have long-lasting implications.

There is also evidence that individuals with depression symptoms and those who exhibit suicidal behaviors are less likely to reach their potential academically. According to the Department of Education, 50 percent of children with serious emotional and behavioral problems drop out of high school, compared to 30 percent of students with other disabilities (U.S. Department of Education 2001). Stoep et al. (2003) find that over half of the adolescents in the United States who fail to complete their secondary education have a diagnosable psychiatric disorder. Using a twin sample from Minnesota, Marmorstein and Iacono (2001) conclude that depression is related to significant difficulties in functioning and school adjustment which result in an increased number of suspensions and failure of classes. Slap et al. (2001) document that those who attempt suicide perform poorer at school and have a lower level of school connectedness than non-attempters.

The relationship from labor market outcomes to poor mental health also cannot be ignored. Mental health may certainly be affected by labor market involvement as higher wages may improve mental health. In the simplest case, more income can allow a person to purchase treatment for mental illness. Higher incomes might also remove stress from financial insecurity and contribute to good health. Hamermesh and Soss (1974) propose that suicide occurs when an individual's taste for living plus the total discounted lifetime utility, which is a function of permanent income, equals zero. Aggregate suicide rates should therefore fluctuate with expectations about future income and the unemployment rate. Indeed, a number of studies on the economic determinants of suicide show that suicide rates fall with rising incomes and rise with the unemployment rate (see Marcotte 2003 for a review). In short, mental health status and labor market outcomes may be intertwined. In this case it is necessary to model the link between suicidal behavior and labor market outcomes as simultaneous equations in order to obtain unbiased estimates.

To the best of our knowledge, only one previous study, Marcotte (2003), has directly estimated the effects of suicide thoughts and attempts on labor market outcomes. The lack of economic studies on suicidal behavior is largely due to lack of individual level data. The majority of studies on the topic use aggregate data from sources such as vital statistics to look at the correlations between economic outcomes such as income and suicidal behavior. However, to the extent that the underlying behavioral mechanism that leads to suicide decisions and thoughts is based on micro-level utility maximization decisions, aggregate data analysis is unsatisfying (Marcotte 2003). Using data from the National Comorbidity Survey conducted in 1991-1992, Marcotte (2003) finds that suicidal behaviors are associated with lower current income, although suicide attempters are associated with a higher current income than those who only thought about suicide. The higher income may result because of income transfers from family members or the government following the attempt. Subsequent mental health treatment may also improve mental health and labor market outcomes. The sample size in this paper is 5,877 and the target population is all adults between ages 18-54. In contrast, we use a much larger sample in this study from a more recent survey and we explicitly look at the responses of young adult population between ages 18 and 26. Our outcome measures differ in that we examine school and work activities. Finally, the cross-sectional nature of the data set used in Marcotte study and the lack of any potential instruments do not allow the author to rule out the possibility that his findings are due to heterogeneity (Marcotte 2003, p. 640).

Despite the lack of evidence in the literature of the labor market effects of suicidal behaviors, a number of studies have examined the relationship between mental illness and labor market outcomes. Given the close link between suicide and mental illness, this literature can provide insights into the true nature of the relationship. Most of this research shows that poor mental health is associated with reduced success in the labor market among adults. The first

generation of papers focusing on the effects of mental health status on labor market outcomes acknowledges but ignores the potential endogeneity between the outcomes. Studies such as Bartel and Taubman (1979, 1986), Mullahy and Sindelar (1990), and Frank and Gertler (1991) all show that individuals with reported or diagnosed mental disorders have worse labor market outcomes than other individuals. Bartel and Taubman (1979, 1986) find that earnings are lower among individuals with a recent or past mental illness diagnosis. Mullahy and Sindelar (1990) find that people with both self-reported and diagnosed mental illnesses are associated with a lower probability of working. Frank and Gertler (1991) show that having a mental illness reduces one's earnings. This paper is also important because it shows the bias introduced by using a utilization based measure that disregards mental health status rather than population based measure of mental illness. The bias arises because only a subset of the mentally ill seeks treatment.

The second generation of papers explicitly tests for and if necessary, accounts for, the potential endogeneity of mental illness in the equations for labor market outcomes. The results of these studies are generally consistent with the first generation studies and find worse labor market outcomes among mentally ill individuals. For example, Ettner et al. (1997) use the National Comorbidity Survey to study effects of the presence of specific mental illnesses (such as schizophrenia and major depression) on the probability of being employed, usual hours of work and annual income. The number of psychiatric disorders experienced during childhood and parental history of mental illness serve as instrumental variables. Results show that psychiatric disorders have detrimental effects on all three labor market outcomes. French and Zarkin (1998) examine the relationship between symptoms of emotional and psychological problems and earnings at a large worksite in the U.S. Results of tests for the endogeneity of mental health in the earnings equation leads the authors to treat mental health as exogenous. They find that earnings are lower and absenteeism is higher among those reporting mental health problems. Hamilton et al. (1997)

examine the simultaneous relationship between unemployment and mental health. Using maximum likelihood estimation, the authors find evidence that being employed is associated with improved mental health and that being in poor mental health is associated with a lower probability of employment.

Our paper expands the second generation literature by looking at the effects of suicide thoughts and attempts on the probability of engaging in a productive activity, that is, work or school. Whereas the average age in many of the above mentioned studies ranges from 35 to 40, this is the first paper to examine schooling and labor market outcomes for a sample of young adults. This paper also uses a variety of methods to control for the potential endogeneity of suicidal behaviors, which allows us to asses the validity of our conclusions. Suicide thoughts and attempts as measures of mental health are advantageous in that we are able to identify people in severe mental distress and are not limited to drawing conclusions for one particular mental illness, such as depression or schizophrenia. Another advantage is that these measures of mental health are population based rather than treatment based, the latter of which, as Frank and Gertler (1991) point out, can produce biased results.

III. Methods

The goal of this paper is to model the effect of suicidal behavior on schooling and labor market outcomes. Therefore, the basic econometric model can be expressed as:

$$L_i = \beta S_i + X_i\alpha + \varepsilon_i, \qquad (1)$$

where L_i is a dichotomous indicator for whether the individual i is either at work or school or both, and is 0 otherwise. S_i is a measure of suicidal behavior, X_i is a vector of personal and family characteristics, and ε is the disturbance term.

Estimating unbiased effects of suicidal behaviors on labor market outcomes is a difficult task. Biased estimates can come from two sources of endogeneity. The first, statistical endogeneity, results from unobserved factors in the error term of equation 1 that are correlated with both the schooling/labor market outcome and the suicidal behaviors. For example, a lack of a caring home environment might lead to insufficient investment in activities of child development and nutrition. This in turn could result simultaneously in poor labor market and schooling outcomes and poor mental health status. Estimates of the impact of suicidal behavior that do not take account of this type of effect would be biased. The second source of endogeneity, structural endogeneity, comes from the potential reverse causality from labor market and schooling outcomes to mental illness and suicidal tendencies. For example, unemployment and poor school performance may contribute to stress and poor mental health outcomes. Not accounting for this relationship would bias the estimates of the suicidal behaviors in equation 1.

We will attempt to address the potential endogeneity problems in a number of ways. First, we will try to control for the statistical endogeneity by specifying a full set of variables designed to minimize the unobserved factors left in the error term. These are variables designed to represent the home and family environment. By comparing models with and without the background variables, we will be able to see the extent to which correlation between suicidal behavior and the outcome variable is affected by controls for these observable characteristics. We are also able to control for suicidal behaviors of the respondents and their family members from Wave 1, when these individuals were at high school. These will further help us eliminate the unobserved heterogeneity.[1] Lastly, we include measures of current and previously observed depressive symptoms to account for

[1] Selection bias may be present in our data as it is possible that individuals with severe mental illness in Wave 1 may have dropped out of the sample because of hospitalization or having committed suicide (although only 96 individuals are dropped from the data between Waves 1 and 3 due to death, the cause of which is unknown). If this is the case then our sample would represent people with less severe illnesses. The extent of the problem should be very small as only 41 of the original 20,745 adolescents were not re-interviewed because they were physically or mentally incapable.

one of the many mental illnesses that may confound the relationship between human capital and suicidal behaviors. These measures are all discussed in further detail below.

In order to guard against any bias from potential measurement error and also to address a potential reverse causality from our outcome measures toward suicidal behavior, we will next turn to the instrumental variables (IV) method. The IV method can be used to address both forms of endogeneity discussed above. Instrumental variables will yield unbiased estimates of the effects of suicidal behaviors if instruments can be found which 1) predict suicidal behaviors; and 2) do not affect outcomes except through their effects on the probability that an individual is suicidal. Variables describing the suicidal behaviors of friends from Wave 1 and Wave 3 will be used as instruments for identification under the assumption that these variables will predict an individual's own decision on suicide while having no direct impact on his/her work and school decisions.

One potential concern with the instrumental variables is that if individuals with suicidal tendencies associate with other people who are suicidal themselves, then the IV strategy would not work. As we will show below, this does not appear to be a problem and suicidal behavior of friends appears to be a valid instrument. Using lagged suicidal behavior of friends might be an alternative way to address some of these concerns but the lagged value does not have much predictive power in the first stage suicide models. We rely on friends' suicidal behaviors as instruments in the absence of better alternatives. The justification for this choice of instruments is presented in detail below.

The third way we address the endogeneity issue and guard against unobserved omitted family and background characteristics is to exploit the genetic oversample of the data. In particular, any observed or unobserved background measures common to both twins will be controlled by estimating a model with twin-fixed effects. To the extent that twin pairs are exposed to the same unobservables, a fixed-effects approach will further eliminate unobserved heterogeneity. In order to implement this design, we restrict our sample to twin pairs, and estimate models of the form:

$$L_i = \delta S_i + X'_i\lambda + \gamma PairID_i + \eta_i, \quad (2)$$

where X' is a vector of fewer control variables then specified in equation 1, and PairID is a unique identifier for each twin pair. Since any observed or unobserved background measures common to both twins will be controlled for by including the PairID, only things that differ between twins, such as gender, marital status, test scores, and drug use will be included in the vector X'. The twin-fixed effects is a powerful way to control for family background characteristics and experiences common to both twins that might be correlated with both the suicidal behaviors and the outcome measures. Unfortunately, one potential problem with this approach is that the results may be biased if there are individual experiences that are correlated with suicidal behavior and that differ between twins. Given that our sample is of young adults, it is likely that events and environments related to the family will be picked up by the fixed effects. Also, it is important to acknowledge the possibility that an individual may be depressed or traumatized by the suicidal behavior of his or her twin, which may in turn cause him or her to engage in suicidal thoughts or attempts. In this case, the difference in labor market outcomes between the two will be reduced, which may cause bias in the estimated coefficients. However, we guard against this problem by controlling for depression in Waves 1 and 3 in some of our specifications.

IV. Data

The data for this project come from the National Longitudinal Study of Adolescent Health (Add Health).[2] The Add Health is the largest and most comprehensive nationally representative survey of adolescents ever undertaken. The first wave of the survey was administered between

[2] The Add Health is a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant P01-HD31921 from the National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123 W. Franklin Street, Chapel Hill, NC 27516-2524 (www.cpc.unc.edu/addhealth/contract.html).

September 1994 and April 1995 to 20,745 youths in grades 7 through 12. Approximately 200 adolescents were randomly selected from each of 132 schools that are representative of U.S. schools with respect to county, urbanicity, school size, school type, and ethnicity. The adolescents were interviewed for the second time between April and August 1996 for Wave 2. Of the original Wave 1 respondents, 15,170 were re-interviewed between August 2001 and April 2002 for Wave 3. There are about 5,500 cases excluded from Wave 3 for various reasons including moving out of country, active military duty, incarceration and being institutionalized, death, and failure to locate in repeated attempts. In order to assess whether individuals who are suicidal in Wave 1 are more likely to be excluded from Wave 3, we compared the means of suicide thoughts and suicide attempts as reported in Wave between those who exit the sample from Waves 1 to 3 and those who stayed in the sample. For both suicide thoughts and suicide attempt, we could not reject the hypothesis that these means are equal to each other. Therefore, we believe that the sample attrition is unlikely to be correlated with the suicidal behaviors in our data. The Wave 3 respondents constitute our main analysis sample. As described below, we also utilize a number of questions from Wave 1.[3]

One interesting feature of Add Health is the genetic oversample, which consists of a large number of twins. As one of our identification strategies, we limit our sample to twins and estimate fixed effect models. There are a total of 578 pairs of identical and fraternal twins in our sample. It is noteworthy that the fractions of twins who report suicide thoughts and suicide attempts are similar to that reported in the full sample.[4]

Dependent Variables

[3] We exclude responses from Wave 2 because a large number of individuals were not interviewed in Wave 2 but are interviewed Waves 1 and 3.

[4] The sample size for our analyses with twins decreases further because of the elimination of missing variables from either of the individuals within the pairs.

Our dependent variable is a dichotomous indicator for whether or not the individual is currently engaged in a productive (or work-related) activity. This indicates whether the individual currently works, attends school, or both. That is, the variable *Work-School* equals 1 if the respondent is either working, in school, or both, and equals 0 otherwise. We define individuals who are at school as engaging in productive activity because many individuals in our sample are still at school age. In fact about 38 percent reported going to school, and 63 percent of those who are working are also at school.[5]

Suicide Variables

The Add Health contains a series of questions about suicidal behaviors of the respondents, their friends, and family members in each wave. The self-suicidal behavior questions include whether the respondent seriously thought about committing suicide in the past 12 months (termed suicide thoughts) and whether she/he attempted suicide in the past 12 months (termed suicide attempt). The two questions on suicide from Wave 3 constitute our primary measures of suicidal behavior. To the extent that suicide attempts are reflective of a more serious mental health problem than having just suicide thoughts, these two measures provide an opportunity to assess the differential effect of the degree of suicidal behavior on our outcome measures.

Table 1 presents the descriptive statistics of the variables used in the analyses as well as their definitions. The first column displays the means for the full sample. The next two columns display the means for the sub-sample of individuals who report that they had suicide thoughts in the past 12 months and those who do not report having such thoughts. As shown in Table 1, 6 percent of the sample seriously thought about committing suicide during the past 12 months and 1.6 percent reported attempting suicide during the past 12 months. The same figures from Wave 1 are 13.4

[5] Another possible outcome to analyze is the wage rate. However, many of these students are employed at or near minimum wage (nearly forty percent making less than seven dollars per hour) and the job choices in school and the associated wages may not reflect accurately what will be their wage trajectory in the future.

percent and 3.7 percent, respectively. Note that among individuals with suicide thoughts, about 27 percent actually attempted suicide. These statistics correspond well with figures from other surveys. For example, the rates of suicide thoughts and attempts from the 1991-1992 National Comorbidity Survey are 5.2 percent and 1.4 percent, respectively, for youths ages 15-24.

In Wave 3, 6.7 percent of our sample reported having friends who tried to kill themselves during the past 12 months, and about 3 percent reported having family members who tried to kill themselves during the same period. These numbers are down from 17.5 percent for friends and from 4.4 percent for family members in Wave 1. The decline in the suicidal behavior of family members between Wave 1 and Wave 3 is consistent with the general decline in suicides that started in 1992 (Lubell et al. 2004).

As illustrated in Table 1, 83.4 percent of our sample is engaged in a work or schooling activity. The engagement in productive activity is less common (79.2 percent versus 83.7 percent) among those with suicide thoughts than those with none.

Other Control Variables

The richness of the Add Health allows us to control for a large set of background variables in our analyses. There are 34 variables in this set and their definitions and descriptive statistics are reported in Table 1. The set includes indicators for age, gender, race, ethnicity, U.S. resident status, marital status, mother's educational attainment, non-wage income, and standard Picture Peabody Vocabulary Test scores from Wave 1.[6] In expanded models, we also include religion, physical health status, cocaine and drug use from Wave 1, indicators of whether the person experienced any type of abuse during childhood, whether she/he spent time in foster care, and whether the father had ever been in jail.

[6] The Add Health Picture Vocabulary Test (AHPVT) is a computerized, abridged version of the Peabody Picture Vocabulary Test-Revised (PPVT-R). The AHPVT is a test of hearing vocabulary, designed for persons aged 2 1/2 to 40 years old who can see and hear reasonably well and who understand standard English to some degree.

It is important to include this extensive set of variables in the analysis to obtain consistent estimates because they will help reduce the amount of unobserved factors in the error term that are correlated with both suicidal behavior and productive activity. For example, negative experiences early in life could predispose individuals to risky, self-destructive or aggressive behaviors by impairing their self-esteem and damaging their ability to form relationships with others (Veltman and Browne 2001, Felitti 1998, and Dube et al. 2003). However, many of these variables may be endogenous themselves, therefore models are estimated with and without these potentially endogenous variables so that we can gauge the effects of the inclusion or exclusion of these variables on the coefficients of interest.

As part of the expanded set of variables, we also include in some models measures of depressive symptoms. In Wave 1, Add Health asks 18 of the 20 standard questions from the Center for Epidemiological Scale for Depression (CES-D).[7] In Wave 3, Add Health includes only 9 of these questions. Responses in the depressive symptoms scale include 0 (never or rarely), 1 (sometimes), 2 (a lot of the time), and 3 (most of the time or all of the time).[8] After summing up scores from these questions, we generate dichotomous indicators that equals 1 if the individual's score places them at the 75th percentile or higher in the sample distribution for that wave and 0 otherwise (Cuellar and Chatterji 2006). We consider these indicators as reflecting elevated levels of depressive symptoms. The CES-D scale does not correspond to a DSM-IV diagnosis of major depression. It is used primarily as a screening tool for depression, not as a diagnostic tool (Eaton et al. 2003). We recognize that depression is endogenous in our models for the same reasons that suicidal behaviors are endogenous. For this reason we present models with and without the measures of depression. In addition, we present some models that only include the depression

[7] See Radloff (1977) for more on the CES-D scale.
[8] Several items assess positive symptoms. These are reversed before the scale scores were calculated. The Add Health CES-D is shown to have a high internal consistency (Goodman 1999).

measure from Wave 1 in order to avoid some of the bias due to potential reverse causality, as depression will have been measured before the labor market and schooling choices are observed. Lastly, we show models that include depression measured both at Wave 1 and Wave 3. Note that the effects of depressive symptoms on labor market and school outcomes are not the main focus of this paper because the CES-D is primarily a screening tool for depression and may not be able to identify cases of depression precisely. Also, the scale of depressive symptoms is a very narrow measure of mental illness as depression is only one of the many that affect human capital formation. Suicide behaviors, by contract, are associated with many different mental illnesses and therefore represent a broad scope of illnesses. Suicidal behaviors are much more likely than the CES-D score to represent the most severe cases of illness. It is the severe cases that are the most likely to have negative schooling and labor market outcomes.

Despite the problems with the depression measures, we believe it is important to show models that include and exclude these measures in order to see the influence of this mental illness on the estimates of suicidal behaviors. This exercise will help us to gauge, albeit rather imperfectly, whether or not suicidal behaviors are merely representing the underlying depressive symptoms. Large decreases in the magnitude of the coefficients on suicide thoughts and attempts that result when our measures of depression are included will indicate that the suicidal behaviors are likely representing the effects of this one particular mental illness which is commonly associated with suicide. Small or no changes in the coefficients will imply that suicidal behaviors affect human capital formation independently of depressive symptoms, however, we still will not be able to isolate indirect effects from other mental illness. That is, even with depression held constant, the coefficients on suicidal behaviors will still represent a combination of the direct and indirect effects since depression is only one of the many conditions associated with suicides. Unfortunately data limitations do not allow us to control for all of the possible comorbid conditions.

In order to conserve a sample as large and representative as possible, we constructed a dummy variable for "missing category" for the variables for which at least one observation was missing due to any reason. This method allows us to utilize a sample size of 14,401, which is larger than those usually employed in most other studies. Age in our sample only ranges from 18 to 26. We use dummy variables for age in order to capture any non-linear association between age and the outcomes variables. Certain variables from Wave 1 are used to avoid the potential bias from any reverse causality. For example, we use the standard test scores and illicit drug use from Wave 1 because the current values may be endogenous to the current productive activity. Furthermore, we do not include the individual's own years of schooling into the models because (1) this variable may be endogenous; and (2) 38 percent of our sample is still in school. Instead, we adopt a quasi-reduced form approach by substituting in the determinants of human capital accumulation, such as mother's education, physical health, and non-wage income.[9] However, we experimented with models that include the number of years of schooling, models that include the standard test scores from Wave 3, and models that are only estimated for the non-school sample (the outcome is "work" in that case). Results are all similar to those presented in this paper and are available upon request.

V. Results

We begin by discussing the determinants of suicide thoughts and attempts. The results in Table 2 display the effects of the suicidal behaviors of friends and family as well as personal characteristics on the probability of suicide thought or attempts among Add Health respondents. We present results from three different specifications for both suicidal thoughts and attempts. The first column does not include any of the depression indicators from Waves 1 and 3. The second column presents the results with the depression indicator from Wave 1 and the third column

[9] Our health variable is a measure of physical health. Therefore it should not be co-linear with the suicidal behavior. In any case, we estimated models excluding physical health as a control and the results remained the same.

contains the depression indicators from both Waves 1 and 3. These results will later be used as the first stage results in the work-school equations. Linear probability models are shown with robust standard errors to adjust for heteroskedasticity in the error term.[10]

The most striking result from Table 2 is that peer and family behaviors have a strong, positive relationship with the suicidal behaviors of respondents. For example, having a friend who attempted suicide in Wave 3 increases the probability of suicide thoughts by 12 percentage points and suicide attempts by more than 3 percentage points. Similarly, having a family member who had attempted suicide in the past 12 months increases suicide thoughts by 9 percentage points and suicide attempts by 3 percentage points. A past suicide attempt is highly associated with current suicidal behavior, increasing suicide thoughts and suicide attempts by about 9 and 4 percentage points, respectively. This result suggests that mental health problems during adolescence may have persistent effects on the mental health of individuals even after they enter adulthood. The past suicidal experiences of the friends and family members have effects in the expected direction (positive), but the magnitudes of the coefficients are small and are not estimated with much precision. For practical purposes, these effects are not distinguishable from zero.

A few other variables are worth mentioning for their efficacy in predicting suicide thoughts and attempts. Individuals in the top 25th percent of the CES-D distribution (the depression indicators) are positively associated with suicide thoughts and attempts. Having a standardized test score in one of the top three percentile categories actually increases the probability of having suicide thoughts over those individuals having scores in the lowest 25th percentile. It is interesting

[10] We specify linear equations for ease of estimation and interpretation. Instrumental Variable estimation is much more straightforward with a linear model than with a nonlinear model such as a probit. Least squares estimates of coefficients in linear probability models are consistent estimates of average probability derivatives, but standard error estimates are biased as a result of heteroskedasticity (Angrist and Krueger 1999). We report standard error estimates that are robust to any form of heteroskedasticity.

to note that the effect monotonically increases as one moves in the direction of higher test scores.[11] However, the differences disappear when suicidal attempts are considered. Having suffered any type of abuse as a child is positively related to current suicide thoughts (4 percentage points) and attempts (1 percentage point). A similar pattern is observed for the effect of having a father who was ever jailed, although the effect is only statistically significant for suicide thoughts. Being married and being in good physical health are negatively related to both suicide thoughts and attempts.

Table 3A presents baseline OLS results for the effects of suicide thoughts and attempts on the probability of being in a productive activity as measured by working and/or being at school. The results for the suicide thoughts are displayed in column 1 and the results for the suicide attempts are displayed in column 2. None of the family background and socio-economic status variables is controlled for in the Table 3A specification. Table 3B presents the results from these expanded specifications. In Table 3B, columns 1 and 4 exclude the two measures of depression indicator, columns 2 and 5 include only depression indicator from Wave 1, and columns 3 and 6 include the depression indicators from Waves 1 and 3.

A comparison of the results in Tables 3A and 3B shows that including the larger set of variables does not affect the sign or the statistical significance of the suicide coefficients in the work-school models, although the magnitudes of the effects fall somewhat when the larger set of variables is included. The results from Tables 3A and 3B indicate that having suicide thoughts decrease the probability of being in a productive activity by a range of 3 to 6 percentage points, and attempting suicide decreases the probability of being in a productive activity by a range of 10 to 14

[11] The reason for including the test scores as dummies rather than as a continuous percentile is because the test scores are either missing for or not taken by about 5 percent of the respondents. In order to avoid dropping these individuals, we use dummy categories for test scores and include a dummy category for missing test scores. However, dropping observations with missing test scores and using a continuous test score variable produced results very similar to those presented in the paper.

percentage points. Another interesting finding is that the inclusion of the measures of depression indicators has no appreciable effect on the magnitude of these coefficients. Also, using a specification with a rich set of control variables does not have much effect on the overall fit of the model as indicated by the R-squared values. The fact that controlling for a large set of background characteristics and past suicidal behavior only slightly reduces the effect of current suicide thoughts and attempts can be interpreted to mean that unobserved heterogeneity accounts for only a small percentage of the effect of suicidal behavior on human capital activities. However, an alternative interpretation is that the additional variables, though statistically significant in the work school equation, are not able to capture the omitted variables that are correlated with suicide thoughts and attempts. This suggests that the results from the two-state least squares estimation and the fixed effects models are necessary for drawing more valid conclusions.

Given the large set of control variables used in Table 3B, this is our preferred specification for OLS models. An interesting result that arises in Table 3B is that the current suicidal behaviors affect the decision to go to work or school even after holding constant past suicide attempts, and holding constant current and past suicide attempts of a family member. In fact, none of these other suicide measures are statistically significant predictors of the work-school decision. Although the coefficients are negative as one would expect, the magnitudes are small. It appears that these factors primarily affect the outcomes of individuals through their influence on the current suicidal behaviors of individuals, as shown in Table 2.

The other control variables in Table 3B are usually consistent with our expectations and the results from the relevant literature. The indicators for depressive symptoms in Wave 1 and 3 are negatively associated with the probability of work-school. High standard test scores at high school and having a mother with more than a high school education are both associated with increases in working and schooling. Being in good physical health is a strong predictor of engaging in

productive activities, while having spent time in foster care is negatively associated with these outcomes. Finally, having used illicit drugs at high school, and having a father who was jailed in the past have negative effects on working/schooling.

Table 4 shows the results of two-stage least squares (TSLS) estimation of suicidal behaviors on the outcome variable for select coefficients.[12] Here, the variables from our preferred specification, the full specification, are reported since the inclusion of the potentially endogenous variables does not seem to have a large effect on the coefficients on the suicide variables. The TSLS results are qualitatively similar to those in Table 3B, but the magnitudes are much larger. Having suicide thoughts decreases the probability of being in a productive activity by a range of about 20-22 percentage points, while a suicide attempt decreases the probability of being in a productive activity by a range of about 69-72 percentage points. In all models, including measures of depressive symptoms has little effect on the magnitude of the coefficients.

Intuitively, the instruments are attractive because there is existing strong evidence that peer suicide affects one's own state of mental health and resulting behaviors. For example, in a sample of high school students, Ho et al. (2000) find that there is a high risk of suicidal behaviors and psychiatric disturbances among peers of individuals who completed suicide. Cerel et al. (2005) find that adolescents who are exposed to peer suicide are more likely to have suicidal thoughts and attempts and to engage in other destructive behavior such as substance use.

While it is not hard to imagine that a friend's suicidal behavior strongly predicts an individual's own behavior, we believe it is unlikely that the suicidal behavior of a friend will have direct effects on one's own labor market and schooling decisions above and beyond the effects on the individual's own suicidal behavior, particularly when a measure of depression is held constant. However, one possibility is that youths react to peer suicide by engaging in risky behavior, such as

[12] To economize on space, we present only the key coefficients. The coefficients from other variables largely remain same with those in Table 3B. The full results are available from the authors upon request.

substance abuse, and if that behavior has a direct effect on labor market and school outcomes, the exogeneity of the instruments may be called into question. One can guard against this criticism by including controls for current risky behavior, such as drug and alcohol use. The problem is that these variables may themselves be endogenous to our outcome measures. This is why we control for measures of *past* drug use in the models, which do not suffer from endogeneity. Despite the potential endogeneity problem, we re-estimated our models including current drug and alcohol use. These models did not alter the estimates of suicidal behavior in any significant way.

The validity of our instrumental variables analyses hinges on the assumption that friends' suicidal behaviors are strongly associated with the individuals' own suicidal behaviors, while having no direct association with the outcome measures that we examine. The strength of the instruments can be gauged in two ways—theoretically and empirically. As we have discussed, the instruments have some theoretical strengths and weaknesses, but Table 4 shows evidence that the instruments are valid, nonetheless, based on empirical tests. As reported at the bottom of Table 4, the two instruments, a friend's attempt in the first wave and a friend's attempt in the third wave, are strong predictors of current suicidal behaviors as indicated by the F-statistics. Furthermore, the Durbin-Wu-Hausman test results indicate that OLS estimate is inconsistent at less than 10 percent level in all models. Finally, the results from the over-identification tests suggest that the instruments can be appropriately excluded from the second stage equations.

The results from the twin sample which includes the twin fixed effects are show in Table 5. Only the coefficients on select variables of interest are shown for brevity. We believe the results of these specifications are reliable since the fixed effects can control for a host of unmeasured, time invariant characteristics that might be correlated with the suicidal behaviors and the outcome measures. Obviously, the number of control variables in the twin models is much lower than the others as many of the background variables exhibit no variation between sibling pairs. The results

are largely consistent with those of the previous tables. Both suicidal thoughts and attempts are negatively and statistically significantly related to the probability of being in a productive activity as measured by working and/or schooling. The effect of suicidal thoughts between TSLS and the fixed effects models are particularly close to each other (around -0.20 versus -0.19) while the effect of suicide attempt goes down sharply between the models. As pointed out in the methods section, the twin results may be an underestimate of the true effects of suicidal behavior if one twin engages in suicidal behavior because of the suicidal behavior of the other. A comparison between the TSLS and twin-fixed effects results supports this possibility, especially for the suicide attempt models. Another potential explanation as to why the suicide attempt coefficients differ between the TSLS and the fixed effects model may be due to the low variation in this variable, especially for the twin fixed effects model. Note that the sample size in the twin fixed effects model is not only smaller but the identification comes from a much smaller number of twin pairs with discordant reports on their suicide attempts, while the number of discordant reports is much higher for the suicidal thoughts as one would expect. Specifically, there are only 10 twin pairs with discordant reports for the suicide attempts out of a total of 383 twin pairs, while the number of twin pairs with discordant reports for the suicide thoughts is 45 out of 383.

Specification Checks

One can argue that the family members' suicide attempts may be endogenous to the individuals' own suicidal behavior. For example, a respondent may attempt suicide and a parent may follow in response. If this is the case, our results from the OLS and twin-fixed effects could be biased. However, the coefficients on the family members' suicide attempts are not statistically significant in any of our models. In fact, our results basically remain the same when we exclude these variables from our models.

Our instrumental variables method can account for the potential reverse causality from labor market and schooling choices to suicidal behavior. A useful exercise is to estimate models that only includes the past suicidal behavior since these models are not subject to any reverse causality problem to begin with. Also, having both the current and past suicidal behavior in the same models might be problematic due to multicollinearity. Therefore, we estimated our models excluding the current suicidal behavior variables. In these models, the past suicidal attempt has a negative coefficient in the work-school model.

In order to see if suicidal behaviors have a differential impact on the decisions to go to work, school, or both, we estimate a multinomial logit model in Table 6. In doing this, we have separated the dichotomous indicator of being in a productive activity into its possible components. The decisions modeled in this table are 1) school, 2) work, 3) school and work together, or 4) no work and no school, which is the omitted reference category. Note that estimating a fixed effects multinomial logit model in our context may be problematic because it has been shown by Monte Carlo simulations that the fixed effects estimator produce a large finite sample bias in discrete choice models when the number of observations in each group is very small (Green 2002). In our case, there are two individuals in each twin pair by definition. Therefore, the fixed effects model in this context will be unreliable so we rely on the expanded set of variables to help control for omitted variables. Since we do not explicitly account for the potential endogeneity of the suicide behaviors in the multinomial logit, we treat these results as merely demonstrative and do not place much emphasis on the magnitude of the coefficients.

The estimates from the multinomial logit model are presented in Table 6. The coefficients in the first three columns show the results for the suicidal thoughts model and the coefficients in the last three columns show the results for the suicide attempt model. The omitted outcome in the multinomial logit models is no-work and no-school. The results indicate that suicidal behaviors as

measured by suicide thoughts and suicide attempts decrease the probability that an individual is engaged in work, school, or both of these activities in comparison to the omitted category of not working and not going to school.

Finally, there may exist some state level variables that can influence both the suicidal behavior and the choice of productive activities. For example, a high unemployment rate in a state may depress labor market opportunities for individuals and encourage school enrollment. At the same time, a high unemployment rate may also cause mental health problems and may in turn increase suicidal tendencies. Because of the concerns about confidentiality, state identifiers have not been made available to the researchers. Therefore, it is not possible to control for any state level characteristics from Wave 3, such as unemployment rate. However, the pseudo-identifiers for states are available, which allows for estimation of models with state fixed effects. These models would control for any type of state level unobservables that would be correlated with both the suicidal behavior and the outcome. We repeated our analyses including the state fixed effects in the models. None of the implications discussed in this paper has changed as a result of this exercise. Given the negligible effects of these dummies on the coefficients of suicide variables, we present the more parsimonious models in this paper.

VI. Conclusion

This paper expand our understanding of the link between mental health and human capital formation by providing insights into the effects of suicidal behavior on the outcome of productive activities of young adults. The suicidal behaviors are measured as suicide thoughts and suicide attempts, and productive activities are measured as engaging in work and/or schooling activities. Obtaining a reliable effect of suicidal behavior on productivity outcomes can be problematic because of the presence of unobserved heterogeneity and a potential reverse causality. In this paper,

we employ three strategies to eliminate these problems. First, we control for a very large set of background variables that are likely to be correlated with both suicidal behavior and our outcome measure. Second, we use the instrumental variables method to control for both unobserved heterogeneity and reverse causality. Finally, we estimate models with twin fixed effects to sweep out any unobservables that are common to both twins.

The results from all three approaches suggest that suicide thoughts and attempts have negative effects on the work and schooling decisions of young adults. All of the effects are found to be robust to different sets of control variables and various specification tests. It is also interesting to note that the size of the effect of suicide attempt is larger than that of the suicidal thoughts in all the models that are estimated. This is a sensible result given that suicide attempt is likely to be an indicator for a more serious mental health problem than having suicidal thoughts only. One explanation for the relatively large effects of suicidal behavior on labor market outcomes found in this paper is that the suicidal behaviors examined here are indicative of more severe mental health problems and should have larger adverse effects on productivity. These effects may be magnified by the direct deleterious effects on productivity via increased bodily injury, absenteeism, and loss of concentration.

The results shown in this paper highlight the costs to individuals and to society resulting from suicidal behaviors. The fact that all of the three strategies that we employ to tease out both the unobserved heterogeneity and reverse causality points to a negative link between the suicidal behaviors and the outcome measure makes us believe that the detrimental effects are consistent with a causal explanation. Furthermore, the small and statistically insignificant coefficients on past suicide attempts arising from models that both include and exclude current suicidal behaviors suggest that there is no long term effect of past attempts (i.e. attempts during high school) on future

human capital formation. This result should be interpreted with caution, however, as teenagers who attempt suicide may receive mental health treatment that prevents future deleterious effects.

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Table 1
Definitions and Descriptive Statistics

Variable	Definition	Full Sample	Suicide thoughts=1	Suicide thoughts=0
Work-school	Dummy variable =1 if working and/or attending school, =0 otherwise	0.834	0.792***	0.837
		(0.372)	(0.406)	(0.370)
Suicide thoughts	Dummy variable =1 if ever thought seriously about committing suicide during the past 12 months, =0 otherwise	0.059	1.000	0.000
		(0.235)	(0.000)	(0.000)
Suicide attempt	Dummy variable =1 if actually attempted suicide during the past 12 months, =0 otherwise	0.016	0.265***	0.000
		(0.124)	(0.442)	(0.000)
Suicidal friend	Dummy variable =1 if any friends tried to kill themselves, =0 otherwise	0.067	0.223***	0.057
		(0.250)	(0.416)	(0.233)
Suicidal family	Dummy variable =1 if any family members tried to kill themselves, =0 otherwise	0.029	0.095***	0.025
		(0.167)	(0.294)	(0.155)
Suicide thoughs_w1	Dummy variable =1 if ever thought about committing suicide during the past 12 months (reported at Wave 1), =0 otherwise	0.134	0.307***	0.123
		(0.340)	(0.462)	(0.328)
Suicide attempt_w1	Dummy variable =1 if actually attempted suicide during the past 12 months (reported at Wave 1), =0 otherwise	0.037	0.107***	0.032
		(0.189)	(0.310)	(0.178)
Suicidal friend_w1	Dummy variable =1 if any friends tried to kill themselves (reported at Wave 1), =0 otherwise	0.175	0.245***	0.171
		(0.380)	(0.431)	(0.376)
Suicidal family_w1	Dummy variable =1 if any family members tried to kill themselves (reported at Wave 1), =0 otherwise	0.044	0.064***	0.042
		(0.204)	(0.245)	(0.201)
Catholic	Dummy variable =1 if Catholic, =0 otherwise	0.255	0.230*	0.256
		(0.436)	(0.421)	(0.437)
Protestant	Dummy variable =1 if Protestant, =0 otherwise	0.406	0.348***	0.410
		(0.491)	(0.477)	(0.492)
No religion	Dummy variable =1 if no religion or agnostic, =0 otherwise	0.205	0.281***	0.200
		(0.403)	(0.450)	(0.400)
Other religion [a]	Dummy variable =1 if other religion, =0 otherwise	0.135	0.141	0.134
		(0.341)	(0.349)	(0.341)
Healthy	Dummy variable =1 if in good physical health, =0 otherwise	0.954	0.888***	0.958
		(0.209)	(0.316)	(0.200)
Any abuse	Dummy variable =1 if experienced sexual abuse, physical abuse, or neglect from parents or other adult caregivers by the start of 6th grade, =0 otherwise	0.245	0.419***	0.234
		(0.430)	(0.494)	(0.423)
Foster	Dummy variable =1 if ever spent time in foster care, =0 otherwise	0.023	0.041***	0.022
		(0.151)	(0.199)	(0.147)
Jailed father	Dummy variable =1 if father ever spent time in prison, =0 otherwise	0.147	0.233***	0.142
		(0.354)	(0.423)	(0.349)
Cocaine_w1	Dummy variable =1 if ever used cocaine (reported at Wave 1), =0 otherwise	0.032	0.052***	0.031

		(0.175)	(0.222)	(0.172)
Marijuana_w1	Dummy variable =1 if ever used marijuana(reported at Wave 1), =0 otherwise	0.277	0.331***	0.274
		(0.448)	(0.471)	(0.446)
Age	Age in years	21.956	21.649***	21.975
		(1.772)	(1.837)	(1.776)
Age18 [a]	Dummy variable =1 if 18 years of age, =0 otherwise	0.010	0.014	0.009
		(0.098)	(0.118)	(0.097)
Age19	Dummy variable =1 if 19 years of age, =0 otherwise	0.095	0.138***	0.092
		(0.293)	(0.345)	(0.289)
Age20	Dummy variable =1 if 20 years of age, =0 otherwise	0.132	0.156**	0.131
		(0.339)	(0.363)	(0.337)
Age21	Dummy variable =1 if 21 years of age, =0 otherwise	0.161	0.165	0.161
		(0.368)	(0.371)	(0.368)
Age22	Dummy variable =1 if 22 years of age, =0 otherwise	0.189	0.191	0.187
		(0.391)	(0.393)	(0.391)
Age23	Dummy variable =1 if 23 years of age, =0 otherwise	0.191	0.136***	0.195
		(0.393)	(0.343)	(0.396)
Age24	Dummy variable =1 if 24 years of age, =0 otherwise	0.163	0.145	0.164
		(0.369)	(0.352)	(0.370)
Age25	Dummy variable =1 if 25 years of age, =0 otherwise	0.051	0.052	0.051
		(0.220)	(0.222)	(0.220)
Age26+	Dummy variable =1 if 26 years of age, =0 otherwise	0.008	0.004	0.008
		(0.090)	(0.059)	(0.091)
Male	Dummy variable =1 if male, =0 otherwise	0.468	0.442	0.470
		(0.499)	(0.497)	(0.499)
White	Dummy variable =1 if white, =0 otherwise	0.662	0.713***	0.658
		(0.473)	(0.453)	(0.474)
Black	Dummy variable =1 if black, =0 otherwise	0.227	0.178***	0.230
		(0.419)	(0.383)	(0.421)
Other race [a]	Dummy variable =1 if other race, =0 otherwise	0.111	0.109	0.112
		(0.315)	(0.312)	(0.315)
Hispanic	Dummy variable =1 if Hispanic ethnicity, =0 otherwise	0.161	0.149	0.162
		(0.368)	(0.357)	(0.369)
U.S. born	Dummy variable =1 if born in the U.S., =0 otherwise	0.920	0.926	0.920
		(0.271)	(0.262)	(0.271)
PVT_w1A [a]	Standard Peabody test score ranking from Wave 1 in the lowest 25 percentile	0.250	0.177***	0.255
		(0.434)	(0.382)	(0.436)
PVT_w1B	Standard Peabody test score ranking from Wave 1 in the 25-50 percentile	0.257	0.257	0.256
		(0.438)	(0.437)	(0.437)

PVT_w1C	Standard Peabody test score ranking from Wave 1 in the 50-75 percentile	0.233	0.257	0.231
		(0.423)	(0.437)	(0.422)
PVT_w1D	Standard Peabody test score ranking from Wave 1 in the highest 25 percentile	0.260	0.310***	0.257
		(0.439)	(0.463)	(0.437)
Married	Dummy variable =1 if married, =0 otherwise	0.171	0.099***	0.176
		(0.377)	(0.299)	(0.381)
Mother high school- [a]	Dummy variable =1 if mother has less than a high school degree reported at Wave 1, =0 otherwise	0.159	0.139	0.160
		(0.366)	(0.346)	(0.367)
Mother high school	Dummy variable =1 if mother has a high school degree reported at Wave 1, =0 otherwise	0.352	0.353	0.351
		(0.477)	(0.478)	(0.477)
Mother high school+	Dummy variable =1 if mother has more than a high school degree at Wave 1, =0 otherwise	0.489	0.508	0.488
		(0.500)	(0.500)	(0.500)
Non-wage	Non-wage income in the past year in dollars	1909.3	1662.2	1924.8
		(14238.2)	(7768.9)	(14551.6)
Non-wage1[a]	Dummy variable =1 if non-wage income is < 0, =0 otherwise	0.031	0.039	0.030
		(0.173)	(0.196)	(0.171)
Non-wage2	Dummy variable =1 if non-wage income is =0, =0 otherwise	0.536	0.507*	0.538
		(0.499)	(0.500)	(0.499)
Non-wage3	Dummy variable =1 if 0<non-wage income<=1000, =0 otherwise	0.158	0.161	0.158
		(0.365)	(0.367)	(0.365)
Non-wage4	Dummy variable =1 if 1000<non-wage income<=2000, =0 otherwise	0.067	0.072	0.067
		(0.250)	(0.259)	(0.249)
Non-wage5	Dummy variable =1 if 2000<non-wage income<=5000, =0 otherwise	0.098	0.103	0.97
		(0.297)	(0.305)	(0.296)
Non-wage6	Dummy variable =1 if 5000<non-wage income<=10000, =0 otherwise	0.054	0.070**	0.053
		(0.227)	(0.255)	(0.225)
Non-wage7	Dummy variable =1 if 10000<non-wage income, =0 otherwise	0.056	0.047	0.056
		(0.230)	(0.212)	(0.231)
Number of observations		14,401	848	13,553

Notes: Standard deviations are in parentheses. *, **, and *** indicate that the mean is statistically different between the sample with suicide thoughts and those without at the 10%, 5%, and 1% levels, respectively.

[a] Omitted category

Table 2
Determinants of Suicide Thoughts and Attempts

Variable	Suicide Thoughts	Suicide Thoughts	Suicide Thoughts	Suicide Attempts	Suicide Attempts	Suicide Attempts
Suicidal friend	0.120***	0.119***	0.114***	0.035***	0.035***	0.034***
	(0.013)	(0.013)	(0.013)	(0.007)	(0.007)	(0.007)
Suicidal family	0.090***	0.088***	0.088***	0.030***	0.029**	0.029**
	(0.018)	(0.018)	(0.018)	(0.011)	(0.011)	(0.011)
Suicide attempt_w1	0.094***	0.086***	0.083***	0.038***	0.035***	0.034***
	(0.016)	(0.016)	(0.016)	(0.010)	(0.010)	(0.010)
Suicidal friend_w1	0.008	0.006	0.004	0.003	0.003	0.002
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
Suicidal family_w1	0.001	-0.001	-0.000	0.011	0.011	0.011
	(0.011)	(0.011)	(0.011)	(0.007)	(0.007)	(0.007)
Catholic	-0.003	-0.003	-0.002	-0.003	-0.003	-0.003
	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)
Protestant	-0.004	-0.004	-0.003	-0.005	-0.005	-0.004
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
No religion	0.015**	0.015**	0.015**	0.002	0.002	0.002
	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)
Healthy	-0.071***	-0.067***	-0.060***	-0.030***	-0.029***	-0.026***
	(0.014)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)
Any abuse	0.043***	0.041***	0.038***	0.013***	0.012***	0.011***
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
Foster	0.012	0.011	0.012	0.015	0.015	0.016
	(0.016)	(0.016)	(0.016)	(0.011)	(0.011)	(0.011)
Jailed father	0.027***	0.027***	0.025***	0.005	0.005	0.004
	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)
Cocaine_w1	0.009	0.006	0.006	0.003	0.003	0.003
	(0.014)	(0.014)	(0.014)	(0.008)	(0.008)	(0.008)
Marijuana_w1	0.004	0.002	0.000	-0.001	-0.001	-0.002
	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)
Age19	-0.004	-0.004	-0.003	0.015	0.015	0.015
	(0.024)	(0.024)	(0.024)	(0.011)	(0.011)	(0.011)
Age20	-0.021	-0.021	-0.019	0.004	0.003	0.004
	(0.023)	(0.023)	(0.023)	(0.011)	(0.011)	(0.011)
Age21	-0.026	-0.028	-0.025	0.003	0.003	0.004
	(0.023)	(0.023)	(0.023)	(0.010)	(0.010)	(0.010)
Age22	-0.023	-0.025	-0.023	0.002	0.001	0.002
	(0.023)	(0.023)	(0.023)	(0.010)	(0.010)	(0.010)
Age23	-0.039*	-0.041*	-0.037	-0.000	-0.001	0.000
	(0.023)	(0.023)	(0.023)	(0.010)	(0.010)	(0.010)
Age24	-0.024	-0.026	-0.022	-0.000	-0.001	0.000
	(0.023)	(0.023)	(0.023)	(0.010)	(0.010)	(0.010)
Age25	-0.014	-0.016	-0.013	-0.002	-0.002	-0.001
	(0.024)	(0.024)	(0.024)	(0.011)	(0.011)	(0.011)
Age26+	-0.044	-0.049*	-0.045*	-0.003	-0.005	-0.003
	(0.027)	(0.027)	(0.027)	(0.013)	(0.013)	(0.013)
Male	-0.004	-0.002	0.002	-0.004*	-0.003	-0.002
	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)
White	0.007	0.008	0.007	-0.005	-0.005	-0.005

	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)
Black	-0.005	-0.004	-0.006	-0.004	-0.004	-0.005
	(0.008)	(0.008)	(0.008)	(0.005)	(0.005)	(0.005)
Hispanic	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
U.S. born	-0.012	-0.012	-0.012	-0.004	-0.004	-0.004
	(0.008)	(0.008)	(0.008)	(0.004)	(0.004)	(0.004)
Married	-0.027***	-0.027***	-0.026***	-0.007***	-0.007***	-0.007***
	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)
PVT_w1B	0.014**	0.016***	0.017***	0.005*	0.006**	0.006**
	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)
PVT_w1C	0.018***	0.021***	0.022***	0.005	0.006*	0.006*
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
PVT_w1D	0.028***	0.033***	0.033***	0.004	0.005	0.005
	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)
Mother high school	0.004	0.005	0.006	-0.006	-0.006	-0.005
	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)
Mother high school+	0.004	0.006	0.007	-0.006	-0.005	-0.005
	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)
Nonwage2	-0.015	-0.015	-0.012	-0.010	-0.010	-0.009
	(0.013)	(0.013)	(0.013)	(0.008)	(0.008)	(0.008)
Nonwage3	-0.015	-0.016	-0.015	-0.007	-0.007	-0.007
	(0.013)	(0.013)	(0.013)	(0.008)	(0.008)	(0.008)
Nonwage4	-0.013	-0.015	-0.013	-0.007	-0.007	-0.007
	(0.015)	(0.015)	(0.015)	(0.009)	(0.009)	(0.009)
Nonwage5	-0.015	-0.015	-0.013	-0.009	-0.009	-0.008
	(0.014)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)
Nonwage6	-0.003	-0.004	-0.001	-0.007	-0.007	-0.006
	(0.016)	(0.016)	(0.016)	(0.009)	(0.009)	(0.009)
Nonwage7	-0.020	-0.021	-0.019	-0.014*	-0.014*	-0.014
	(0.015)	(0.015)	(0.015)	(0.009)	(0.009)	(0.008)
Depressed	---	0.025***	0.018***	---	0.008***	0.005*
		(0.005)	(0.005)		(0.003)	(0.003)
Depressed_w1	---	---	0.056***	---	---	0.018***
			(0.005)			(0.003)
Constant	0.129***	0.117***	0.088***	0.057***	0.053***	0.044**
	(0.031)	(0.031)	(0.031)	(0.018)	(0.018)	(0.018)
R-squared	0.06	0.06	0.07	0.03	0.03	0.04
Observations	14,401	14,401	14,401	14,401	14,401	14,401

Notes: *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are in parentheses. Models also include missing dummy categories for friends' suicidal behavior, family members' suicidal behavior, abuse, foster care, jailed father, drug use, standard test scores, mother's education, and non-wage income.

Table 3A
OLS Estimates for Work-School Model for Basic Specification

Variable	Work-School	Work-School
Suicide thoughts	-0.061***	---
	(0.014)	
Suicide attempt	---	-0.139***
		(0.030)
Age19	0.006	0.008
	(0.033)	(0.033)
Age20	-0.003	-0.001
	(0.033)	(0.033)
Age21	-0.010	-0.008
	(0.032)	(0.033)
Age22	-0.014	-0.013
	(0.032)	(0.032)
Age23	-0.003	-0.001
	(0.032)	(0.033)
Age24	0.007	0.008
	(0.033)	(0.033)
Age25	-0.003	-0.002
	(0.035)	(0.035)
Age26+	-0.028	-0.026
	(0.049)	(0.049)
Male	0.018***	0.018***
	(0.006)	(0.006)
White	0.037***	0.036***
	(0.011)	(0.011)
Black	-0.025*	-0.025**
	(0.013)	(0.013)
Hispanic	0.012	0.012
	(0.009)	(0.009)
U.S. born	-0.080***	-0.080***
	(0.012)	(0.012)
Married	-0.051***	-0.051***
	(0.009)	(0.009)
PVT_w1B	0.079***	0.079***
	(0.010)	(0.010)
PVT_w1C	0.107***	0.106***
	(0.010)	(0.010)
PVT_w1D	0.141***	0.139***
	(0.010)	(0.010)
Mother high school	0.041***	0.040***
	(0.011)	(0.011)
Mother high school+	0.087***	0.086***
	(0.011)	(0.011)
Non-wage2	0.017	0.016
	(0.019)	(0.019)
Non-wage3	-0.005	-0.006
	(0.020)	(0.020)
Non-wage4	0.014	0.014
	(0.022)	(0.022)

Non-wage5	-0.033	-0.034
	(0.021)	(0.021)
Non-wage6	-0.027	-0.028
	(0.023)	(0.023)
Non-wage7	-0.001	-0.002
	(0.023)	(0.023)
Constant	0.761***	0.760***
	(0.039)	(0.039)
R-squared	0.06	0.06
Observations	14,401	14,401

Notes: Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Models also include missing dummy categories for standard test scores, mother's education, and non-wage income.

Table 3B
OLS Estimates for Work-School Model for Expanded Specification

Variable	Work-School	Work-School	Work-School	Work-School	Work-School	Work-School
Suicide thoughts	-0.037***	-0.033**	-0.030**	---	---	---
	(0.014)	(0.014)	(0.014)			
Suicide attempt	---	---	---	-0.106***	-0.102***	-0.098***
				(0.030)	(0.030)	(0.030)
Suicide attempt_w1	-0.014	-0.000	0.000	-0.014	0.001	0.001
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Suicidal family	-0.017	-0.015	-0.014	-0.017	-0.015	-0.014
	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)
Suicidal family_w1	-0.021	-0.016	-0.016	-0.020	-0.015	-0.015
	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)	(0.016)
Catholic	0.006	0.007	0.006	0.006	0.007	0.006
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Protestant	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
No religion	-0.039***	-0.038***	-0.038***	-0.039***	-0.038***	-0.038***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Healthy	0.105***	0.099***	0.098***	0.104***	0.099***	0.097***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Any abuse	-0.008	-0.005	-0.004	-0.009	-0.005	-0.004
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Foster	-0.095***	-0.094***	-0.094***	-0.094***	-0.093***	-0.093***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Jailed father	-0.033***	-0.033***	-0.033***	-0.034***	-0.034***	-0.033***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Cocaine_w1	-0.063***	-0.059***	-0.059***	-0.063***	-0.059***	-0.058***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Marijuana_w1	-0.022***	-0.018**	-0.017**	-0.022***	-0.018**	-0.017**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Age19	0.010	0.010	0.009	0.011	0.011	0.011
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Age20	0.003	0.004	0.004	0.004	0.005	0.005
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Age21	-0.001	0.002	0.002	0.000	0.003	0.003
	(0.032)	(0.032)	(0.032)	(0.033)	(0.033)	(0.033)
Age22	-0.003	0.001	0.000	-0.002	0.002	0.001
	(0.032)	(0.032)	(0.032)	(0.033)	(0.033)	(0.033)
Age23	0.010	0.014	0.014	0.011	0.016	0.015
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Age24	0.019	0.022	0.021	0.020	0.023	0.022
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Age25	0.010	0.013	0.013	0.010	0.014	0.013
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Age26+	-0.013	-0.004	-0.005	-0.011	-0.003	-0.004
	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)
Male	0.019***	0.015**	0.014**	0.018***	0.014**	0.013**
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
White	0.035***	0.032***	0.032***	0.034***	0.031***	0.032***

	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Black	-0.025*	-0.027**	-0.026**	-0.026*	-0.027**	-0.026**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Hispanic	0.010	0.009	0.009	0.010	0.009	0.009
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
U.S. born	-0.067***	-0.068***	-0.068***	-0.067***	-0.068***	-0.068***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Married	-0.052***	-0.052***	-0.052***	-0.052***	-0.052***	-0.052***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
PVT_w1B	0.081***	0.076***	0.076***	0.081***	0.076***	0.076***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
PVT_w1C	0.107***	0.102***	0.102***	0.107***	0.102***	0.101***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
PVT_w1D	0.137***	0.130***	0.130***	0.137***	0.130***	0.130***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Mother high school	0.036***	0.034***	0.034***	0.035***	0.033***	0.033***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Mother high school+	0.078***	0.075***	0.075***	0.077***	0.074***	0.074***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Non-wage2	0.013	0.014	0.013	0.012	0.014	0.013
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Non-wage3	-0.011	-0.009	-0.009	-0.011	-0.009	-0.010
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Non-wage4	0.009	0.012	0.011	0.008	0.011	0.011
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Non-wage5	-0.035*	-0.034	-0.035*	-0.036*	-0.035*	-0.035*
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Non-wage6	-0.029	-0.028	-0.029	-0.030	-0.029	-0.029
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Non-wage7	-0.005	-0.004	-0.005	-0.005	-0.005	-0.005
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Depressed_w1	---	-0.043***	-0.041***	---	-0.043***	-0.041***
		(0.008)	(0.008)		(0.008)	(0.008)
Depressed_w3	---	---	-0.014**	---	---	-0.014**
			(0.007)			(0.007)
Constant	0.679***	0.700***	0.707***	0.680***	0.701***	0.708***
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
R-squared	0.07	0.07	0.07	0.07	0.07	0.07
Observations	14,401	14,401	14,401	14,401	14,401	14,401

Notes: Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Models also include missing dummy categories for family members' suicidal behavior, abuse, foster care, jailed father, drug use, standard test scores, mother's education, and non-wage income.

Table 4
TSLS Estimates for Work-School Model (n=14,401)

Variable	Work-School	Work-School	Work-School	Work-School	Work-School	Work-School
Suicide thoughts	-0.216**	-0.206*	-0.204*	---	---	---
	(0.106)	(0.107)	(0.112)			
Suicide attempt	---	---	---	-0.722*	-0.685*	-0.682*
				(0.372)	(0.372)	(0.393)
Depressed_w1	---	-0.038***	-0.038***		-0.038***	-0.038***
		(0.008)	(0.008)		(0.008)	(0.008)
Depressed_w3	---	---	-0.004			-0.003
			(0.009)			(0.010)
R-squared	0.06	0.06	0.06	0.03	0.04	0.04
Observations	14,401	14,401	14,401	14,401	14,401	14,401
F-test on instruments	45.71***	45.38***	41.59***	11.99***	11.85***	10.74***
Hausman test statistic	3.15*	2.89*	2.68*	3.27*	2.88*	2.61*
Overidentification test statistic	0.013	0.223	0.241	0.037	0.292	0.307

Notes: Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Models also include the extended set of variables as shown in Tables 3B.

Table 5
Fixed Effects Estimates for Work-School Model from the Twin Sample

Variable	Work-School	Work-School	Work-School	Work-School	Work-School	Work-School
Suicide thoughts	-0.188**	-0.182**	-0.185**	---	---	---
	(0.072)	(0.071)	(0.072)			
Suicide attempt	---	---	---	-0.276*	-0.249*	-0.252*
				(0.153)	(0.153)	(0.153)
Depressed_w1	---	-0.119**	-0.113**	---	-0.126**	-0.137**
		(0.045)	(0.046)		(0.055)	(0.057)
Depressed_w3	---	---	0.033	---	---	0.044
			(0.052)			(0.054)
R-squared	0.06	0.08	0.08	0.05	0.07	0.07
Number of twin pairs	383	383	382	383	383	382

Notes: Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Models include all time-varying variables described in Tables 3B.

Table 6
Multinomial Logit Coefficients for the Work-School Model

Variable	School, No Work	No School, Work	School Work	School, No Work	No School, Work	School, Work
Suicide thoughts	-0.296**	-0.209**	-0.248**	---	---	---
	(0.139)	(0.103)	(0.119)			
Suicide attempt	---	---	---	-0.499**	-0.588***	-0.721***
				(0.237)	(0.177)	(0.212)
Suicidal family	-0.082	-0.054	-0.146	-0.097	-0.056	-0.150
	(0.195)	(0.138)	(0.166)	(0.193)	(0.136)	(0.165)
Suicide attempt_w1	0.019	0.061	-0.123	0.017	0.066	-0.114
	(0.182)	(0.123)	(0.151)	(0.182)	(0.123)	(0.151)
Suicidal family_w1	-0.159	-0.078	-0.115	-0.152	-0.070	-0.106
	(0.165)	(0.112)	(0.135)	(0.164)	(0.112)	(0.135)
Catholic	-0.021	0.051	0.152	-0.022	0.050	0.151
	(0.114)	(0.090)	(0.101)	(0.114)	(0.090)	(0.101)
Protestant	-0.018	0.001	-0.038	-0.021	-0.002	-0.042
	(0.101)	(0.080)	(0.090)	(0.101)	(0.080)	(0.090)
No religion	-0.485***	-0.179**	-0.429***	-0.490***	-0.181**	-0.432***
	(0.114)	(0.087)	(0.100)	(0.114)	(0.087)	(0.100)
Healthy	0.541***	0.463***	0.793***	0.546***	0.460***	0.789***
	(0.155)	(0.100)	(0.134)	(0.155)	(0.100)	(0.134)
Any abuse	-0.172**	-0.003	-0.072	-0.176**	-0.003	-0.072
	(0.083)	(0.060)	(0.070)	(0.083)	(0.060)	(0.070)
Foster	-0.745***	-0.437***	-0.681***	-0.741***	-0.432***	-0.672***
	(0.243)	(0.140)	(0.193)	(0.243)	(0.140)	(0.192)
Jailed father	-0.494***	-0.121*	-0.328***	-0.500***	-0.124*	-0.331***
	(0.102)	(0.069)	(0.083)	(0.102)	(0.069)	(0.083)
Cocaine_w1	-0.949***	-0.345***	-0.229	-0.951***	-0.345***	-0.229
	(0.275)	(0.126)	(0.166)	(0.275)	(0.126)	(0.166)
Marijuana_w1	-0.389***	-0.019	-0.327***	-0.391***	-0.021	-0.329***
	(0.085)	(0.059)	(0.071)	(0.085)	(0.059)	(0.071)
Age19	-0.187	0.508	-0.002	-0.176	0.519	0.013
	(0.289)	(0.315)	(0.280)	(0.289)	(0.316)	(0.282)
Age20	-0.444	0.735**	-0.134	-0.436	0.741**	-0.126
	(0.286)	(0.309)	(0.276)	(0.286)	(0.310)	(0.277)
Age21	-0.591**	0.807***	-0.178	-0.580**	0.814***	-0.168
	(0.284)	(0.307)	(0.274)	(0.285)	(0.309)	(0.276)
Age22	-1.097***	1.039***	-0.406	-1.089***	1.044***	-0.399
	(0.286)	(0.306)	(0.275)	(0.287)	(0.308)	(0.276)
Age23	-1.309***	1.242***	-0.466*	-1.298***	1.249***	-0.457*
	(0.289)	(0.307)	(0.276)	(0.290)	(0.308)	(0.277)
Age24	-1.437***	1.386***	-0.653**	-1.430***	1.390***	-0.647**
	(0.294)	(0.308)	(0.280)	(0.294)	(0.309)	(0.281)
Age25	-1.468***	1.297***	-0.777**	-1.464***	1.297***	-0.775**
	(0.333)	(0.318)	(0.303)	(0.334)	(0.319)	(0.304)
Age26+	-1.412***	1.189***	-0.870**	-1.399***	1.196***	-0.860**
	(0.525)	(0.371)	(0.426)	(0.525)	(0.372)	(0.427)
Male	-0.126*	0.282***	-0.213***	-0.127*	0.281***	-0.215***

	(0.066)	(0.051)	(0.058)	(0.066)	(0.051)	(0.058)
White	-0.225**	0.356***	0.259***	-0.230**	0.351***	0.253**
	(0.110)	(0.086)	(0.099)	(0.110)	(0.087)	(0.099)
Black	-0.235*	-0.199**	0.001	-0.235*	-0.201**	-0.001
	(0.122)	(0.097)	(0.112)	(0.122)	(0.097)	(0.112)
Hispanic	-0.103	-0.040	0.298***	-0.103	-0.041	0.296***
	(0.111)	(0.076)	(0.087)	(0.111)	(0.076)	(0.087)
U.S. born	-0.666***	-0.269**	-0.955***	-0.669***	-0.272**	-0.958***
	(0.142)	(0.108)	(0.120)	(0.142)	(0.109)	(0.121)
Married	-0.845***	-0.156**	-0.918***	-0.842***	-0.156**	-0.917***
	(0.105)	(0.062)	(0.084)	(0.105)	(0.062)	(0.084)
PVT_w1B	0.411***	0.416***	0.546***	0.410***	0.418***	0.547***
	(0.097)	(0.067)	(0.083)	(0.097)	(0.067)	(0.083)
PVT_w1C	0.754***	0.504***	1.011***	0.752***	0.505***	1.012***
	(0.104)	(0.077)	(0.089)	(0.104)	(0.077)	(0.089)
PVT_w1D	1.353***	0.706***	1.449***	1.346***	0.702***	1.444***
	(0.107)	(0.084)	(0.095)	(0.107)	(0.084)	(0.095)
Mother high school	0.438***	0.133*	0.321***	0.434***	0.129*	0.315***
	(0.119)	(0.075)	(0.091)	(0.119)	(0.075)	(0.091)
Mother high school+	1.218***	0.247***	0.850***	1.214***	0.243***	0.845***
	(0.116)	(0.077)	(0.092)	(0.116)	(0.077)	(0.092)
Non-wage2	-0.017	0.161	-0.035	-0.018	0.158	-0.039
	(0.201)	(0.145)	(0.167)	(0.201)	(0.145)	(0.167)
Non-wage3	0.123	-0.182	0.013	0.125	-0.183	0.013
	(0.211)	(0.156)	(0.176)	(0.211)	(0.156)	(0.176)
Non-wage4	0.487**	-0.089	0.210	0.489**	-0.090	0.208
	(0.232)	(0.178)	(0.198)	(0.232)	(0.178)	(0.198)
Non-wage5	0.163	-0.366**	-0.281	0.164	-0.368**	-0.284
	(0.216)	(0.161)	(0.184)	(0.216)	(0.161)	(0.184)
Non-wage6	0.290	-0.387**	-0.180	0.287	-0.392**	-0.185
	(0.232)	(0.176)	(0.199)	(0.232)	(0.176)	(0.200)
Nonwage7	0.468**	-0.141	-0.122	0.466**	-0.148	-0.129
	(0.236)	(0.180)	(0.205)	(0.236)	(0.180)	(0.205)
Depressed	-0.386***	-0.195***	-0.412***	-0.387***	-0.195***	-0.412***
	(0.078)	(0.056)	(0.066)	(0.078)	(0.056)	(0.066)
Depressed_w1	-0.115*	-0.117**	-0.062	-0.121*	-0.116**	-0.060
	(0.070)	(0.053)	(0.061)	(0.070)	(0.053)	(0.060)
Constant	0.324	-0.708*	0.206	0.322	-0.697*	0.218
	(0.413)	(0.374)	(0.373)	(0.413)	(0.375)	(0.374)
Log-Likelihood		16,410.0			16,405.7	
Observations		14,392			14,392	

Notes: Omitted outcome in the multinomial logit model is No-school/No-work. Robust standard errors are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.