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Linking Depressed Earnings to Adolescent Depression

Abstract

In this study, I analyze empirically the ways in which adolescent depression depresses earnings in young adulthood. I test the prominent assertions that adolescent depression is predictive of young adult depression and of lower educational attainment, both of which are, in turn, predictive of lower earnings. I then expand upon the current literature by testing the assumption that those depressed in adolescence would benefit from staying in school. To that end, I first estimate the relationship between adolescent depression and returns to education. Since one relevant alternative to educational attainment is work experience, I then estimate the relationship between adolescent depression and returns to work experience. Finally, I compare the returns to educational attainment with the returns to work experience for individuals depressed in adolescence relative to the returns for their non-depressed peers; I make this comparison first using the full sample, and then using subsamples distinguished by gender, race, and socio-economic status (SES).

Linking Depressed Earnings to Adolescent Depression

A Junior Independent Work Paper

by Emily Sands

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I pledge my honor that this paper represents my own work in accordance with the University Honor Code.

Introduction:

Depression is the primary cause of disability globally (WHO, 2007). A common mental disorder affecting 119 million people, it strikes individuals of both genders, from diverse backgrounds, and of all ages – particularly adolescents (NIMH, 2007). Peak depression rates occur in mid- to late-adolescence, between the ages of fifteen and eighteen (Hankin *et al.*, 1998). When depression strikes in youth, the episodes tend to last longer and recur more frequently (Greden, 2001). With symptoms including depressed mood, loss of interest, low self-esteem, and trouble concentrating, depression in adolescence can have particularly deleterious implications (WHO, 2007). In the short term, adolescent depression is emotionally distressing; in the long term, it can limit educational advancement and job opportunities, thereby impeding upon success in adulthood (Klein *et al.*, 1997; Hamilton *et al.*, 1997).

Given the high rates of adolescent depression and the potential severity of long-term implications, the paucity of longitudinal study on the effects of adolescent depression on economic success is surprising. Most studies on adolescent depression focus primarily on the contributory factors or on the efficacy of treatments; granted, the potential severity of the immediate consequences of depression – including suicide – creates a sense of urgency in evaluation and treatment. However, understanding the mechanisms through which adolescent depression can hinder success in adult life is also crucial, as it can help to maximize returns to this particular human capital endowment.

In this study, I analyze empirically the ways in which adolescent depression depresses earnings in young adulthood. I test the prominent assertions that adolescent depression is predictive of young adult depression and of lower educational attainment, both of which are, in turn, predictive of lower earnings. I then expand upon the current literature by testing the

assumption that those depressed in adolescence would benefit from staying in school. To that end, I first estimate the relationship between adolescent depression and returns to education. Since one relevant alternative to educational attainment is work experience, I then estimate the relationship between adolescent depression and returns to work experience. Finally, I compare the returns to educational attainment with the returns to work experience for individuals depressed in adolescence relative to the returns for their non-depressed peers; I make this comparison first using the full sample, and then using subsamples distinguished by gender, race, and socio-economic status (SES).

Literature Review:

Literature relevant to the relationship between adolescent depression and adult earnings can be separated into two strands. The first links adolescent depression and adult depression. The second links adolescent depression and lower educational attainment. Both adult depression and lower educational attainment are, in turn, linked to lower earnings.

Adolescent depression has been shown to be predictive of adult depression. Analyzing an epidemiologic sample of 776 individuals who were psychiatrically evaluated in 1983, 1985, and 1992, Pine *et al.* (1999) find that individuals with major depression in adolescence are at a two to four times greater risk for depression in young adulthood as compared to those without major depression in adolescence. This finding is consistent with clinical studies. Weissman *et al.* (1999) examined seventy-three subjects with onset of major depressive disorder (MDD) in adolescence as compared to thirty-seven controls with no evidence of psychiatric disorder, performing follow-up studies ten to fifteen years after the initial assessment. They find a two-fold increase in the risk of MDD in adult life among those with early-onset depression (relative risk, 2.2 [95% confidence interval, 1.0-4.7; $p < 0.05$]).

Adult depression is, in turn, correlated with lower labor force participation rates. Lerner *et al.* (2004) followed 229 employees with depression and a healthy control group of 173 employees. They find that at the six-month follow-up, employees with depression have more new unemployment as compared to the control group (12% as compared to 2%).

In cases where depressed individuals are employed, moreover, adult depression is correlated with significantly more job turnover, absenteeism, and lost productive time. Depressed employees have four times the job turnover of the control group (20% as compared to 5% at the six-month follow-up) and four times the mean productivity loss (20.7 ± 4 percent as compared to 5.2 ± 3 percent) (Lerner *et al.*, 2004). Stewart *et al.* (2003) find that depression reduces performance while at work. Analyzing data from the American Productivity Audit, they conclude that the average health-related lost productive time (LPT) among workers with depression is markedly higher than among workers without depression (5.6 hours per week as compared to 1.5 hours per week). Over eighty percent of depressed workers' LPT is explained by lower performance while at work.

With higher unemployment, job turnover, absenteeism, and lost productive time, depressed adults have, on average, lower earnings as compared to their non-depressed colleagues. Greenberg *et al.* (2003) used National Comorbidity Survey Replications (NCS-R) diagnoses rates and statistics from the National Bureau of Labor Statistics to estimate the total economic burden of depression in the US in 2000 at over \$83 billion, up seven percent from 1990. Of this, the workplace costs of depression were an estimated \$51.5 billion. Seventy percent of these workplace costs were attributable to reduced productivity while at work; the remainder was due to unemployment and absenteeism.

Adolescent depression is correlated not only with adult depression, but also with lower educational attainment, particularly among women. Asarnow *et al.* (2005) define low educational attainment as more than two years behind in school or failure to complete high school by age twenty. Examining a cross-sectional survey of 3,471 primary care patients aged 13 to 21 they find that those adolescents who screen positive for depression are 1.5 times more likely to have low educational attainment (CI 1.21-1.78; $p < 0.001$). Similarly, Berndt *et al.* (2000) integrate the data of 531 adult women with chronic depression with the 1995 Census Bureau data to find that women with early-onset depression are less likely to graduate from college as compared to the general female population (16% versus 23%).

In one of the few studies that uses a large, nationally-representative sample of adolescents to examine adolescent depression, Currie and Stabile (2007) also find a positive correlation between adolescent depression and low educational attainment. Using grade repetition as a measure of low educational attainment, they analyze data from the Canadian National Longitudinal Survey of Children and Youth and Add Health. They find that depression is positively correlated with grade repetition at the one-percent significance level.

Lower educational attainment is, in turn, correlated with lower earnings. Upon studying the lower educational attainment among female depressed adolescents, Berndt *et al.* (2000) conclude that “a randomly selected 21-year-old woman with early onset major depressive disorder in 1995 could expect future annual earnings that were 12%-18% lower than those of a randomly selected 21-year-old woman whose onset of major depressive disorder occurred after age 21 or not at all.” Thus, adolescent depression seems to impinge on success in adulthood in part by reducing educational attainment and the accumulation of human capital.

Although the literature examines the correlation between adolescent depression and lower earnings through adult depression and through lower educational attainment, it has yet to address the correlation between adolescent depression and returns to education. Choices of educational attainment are contingent on the perceived returns to schooling. If a variable that could lower returns to schooling, such as depression, is known in advance or predictable by the individual when making educational decisions, it is reasonable to assume that the decision of how far to go in school will at least partially reflect this lower expected return.

It remains unclear, however, whether depressed adolescents' lower average educational attainment is justified by lower average returns to education. According to cognitive theory of depression, depression is correlated with negative thoughts about oneself, the world, and one's future (Beck, 1963). Depressed individuals often report feeling that their lives have been failures and that they are not as good as other people; they lack hope about the future. Comparing normal, non-depressed psychiatric samples and depressed psychiatric samples of 12- to 17- year-old adolescents, Kath and Zettle (1990) conclude that depressed individuals have more cognitive distortions. The work of Haley *et al.* (1985) and Marton *et al.* (1993) confirm this finding. Marton *et al.* also find that measures of cognitive distortion drop somewhat upon remission of the depressive episode, but still persist at higher levels than among individuals not depressed in adolescence. The combination of lower educational attainment and higher cognitive bias among those depressed in adolescence begs the following question: To what extent is the decision of depressed adolescents to go less far in school justified by lower returns to education?

The decision to pursue additional years of education could be influenced not only by cognitive bias and by returns to schooling, but also by returns to work experience, a key relevant alternative to educational attainment. To date, the literature relating depression to employment

emphasizes the increased job turnover, absenteeism, and lost productive time among depressed workers, as well as the correspondingly lower earnings (Lerner *et al.*, 2004; Greenberg *et al.*, 2003); it has yet to analyze the returns to work experience following a depressive episode. Any discrepancy between the returns to work experience for those depressed and not depressed in adolescence could shed additional light on the decision of depressed adolescents to pursue fewer years of education. Specifically, if depressed adolescents' lower average educational attainment is not justified by lower returns to education, perhaps it is justified by higher returns to work experience.

Data: ¹

I analyze results of the National Longitudinal Study of Adolescent Health (Add Health), a school-based longitudinal study of adolescent health and young adult outcomes, using the restricted use version of the data available to Princeton researchers subject to approval by the suppliers of the data (Udry, 2003). I focus on the results of the 15,011 respondents who completed both the 1994-1995 Wave I survey and the 2001-2002 Wave III survey, and who responded to the full Feelings Scale in both waves. With this large, nationally representative sample, the Add Health data facilitates generalization to the population of American adolescents.

At the time of Wave I, individuals in grades seven through twelve were administered an in-school questionnaire and an in-home interview. The in-school questionnaire included questions about gender, race, parents' educational attainment, and grades in four core classes. Parents' educational attainment is the most common measure of SES in epidemiological studies (Winkleby, 1992); as such, I define SES as the average level of parental educational attainment. A proxy for school performance, GPA is calculated as the mean of the grades in each of four core classes. Wave I also included the Add Health Peabody Picture Vocabulary Test, an abridged

¹ My programs for coding and analyzing Add Health data are available upon request.

version of the Peabody Picture Vocabulary Test (PPVT), which has been used since 1959 to assess verbal ability in English-speaking individuals of all ages (Dunn and Dunn, 1981). Total scores on this 78 item test of receptive vocabulary are standardized by age and have been used widely as a proxy for verbal ability (Stockman, 2000).

In both the Wave I and the Wave III in-home interviews, respondents were administered a Feelings Scale nearly identical to The Center for Epidemiologic Studies Depression (CES-D) screener. The original CES-D, reproduced in Appendix 1, was developed in 1977 to measure somatic and affective symptoms of depression in samples of adults (Radloff, 1977). It measures frequency of depressive symptoms in the general population by employing twenty components of depressive symptomology, including feelings of guilt and worthlessness, loss of appetite, and psychomotor retardation. Respondents are asked how frequently they have experienced myriad symptoms in the past week. Each depressive symptom is assigned a score on the basis of frequency and the individual symptom scores are then summed for a total score ranging from 0 to 60. A score below sixteen is indicative of no depression, sixteen to twenty-three represents mild depression, and twenty-four and above constitutes severe depression. Although developed for use with adults, the CES-D has been used widely in research on adolescents as well (Phillips *et al.*, 2006; Radloff, 1999; Roberts *et al.*, 1990; Roberts *et al.*, 1991). At the time of Wave I, respondents were administered the original CES-D with the single omission of the symptom, “Sleep was restless” (Appendix 2); at the time of Wave III, the same individuals, now at the approximate ages of 18 to 24, were administered a more condensed version, covering nine of the nineteen symptoms tested in Wave I (Appendix 3).

I define Dep_{1994} as a measure of depression at the time of Wave I, and Dep_{2001} as a measure of depression at the time of Wave III. Since Dep_{1994} and Dep_{2001} will often be used in

tandem, I develop CES-D-equivalent scores for the variables based only on responses to the nine questions that appeared in both surveys, thereby creating a consistent, abbreviated CES-D. The abbreviated CES-D has been found to have reliability, validity, and dimensionality comparable to the full version (Cornwell, 2003; Roberts *et al.*, 1991; Turvey *et al.*, 1999). Since total scores on the abbreviated nine-question Feelings Scale range from 0 to 27, rescaling with multiplication by $\frac{20}{9}$ yields scores for the Wave I and Wave III data comparable not only to each other, but also to the original CES-D. I define depression in both periods both as a continuous random variable on the 0 to 60 CES-D scale and as binary variables, one each for mild and severe depression ($DepMild_i=1$ for $16 \leq CES - D_i < 24$, $DepMild_i=0$ otherwise; $DepSevere_i=1$ for $24 \leq CES - D_i$, $DepSevere_i=0$ otherwise).

The in-home interview of Wave III also collected data on educational and employment status. Respondents reported the highest year of regular school completed, any degrees or diplomas received, and whether they were in school full-time, part-time, or not at all at the time of the survey. They also reported whether they were employed in each of the years between 1995 and 2002. If employed in the contemporary year, 2001-2002, there is data on whether this employment was full-time or part-time. Respondents were also asked to report personal earned income, defined as income received from wages or salaries, tips, bonuses, overtime pay, and income from self-employment in the current year. In cases where respondents were employed, but stated they were unsure of their personal earned income, they were subsequently asked to choose an income window of best fit; in this study, respondents who self-identified with a particular income window will be assigned that window's mid-point income.

During Wave III, respondents ranged in age from 18 to 24; at these young ages, many were still in school. Although some attend school and work simultaneously, school is largely a

substitute for participation in the labor market; therefore, only on a subset of respondents am I able to analyze earnings. In addition, all analysis of earnings using the currently available Add Health data is an analysis not of long-term, eventual earnings, but rather of earnings in young adulthood. Although these earnings are likely positively correlated with earnings later in life, any extrapolation to the relationship between adolescent depression and eventual labor market outcomes may be tenuous. Data from Add Health's Wave IV will better illuminate the long-term labor market outcomes.

Corroborating Linkages, Methodology and Results:

As discussed, the literature relevant to the relationship between adolescent depression and labor market outcomes finds a positive correlation between adolescent depression and adult depression and a negative correlation between adult depression and earnings; it also finds a negative correlation between adolescent depression and educational attainment and a positive correlation between educational attainment and earnings. Using Add Health data, I test these relationships empirically. Throughout, I perform OLS regressions with robust standard errors.

I define earnings as $\ln(1 + \text{personal earned income})$ in line with Mincer (1958) and Becker and Chiswick's (1966) findings that the regression of the logarithm of earnings on years of schooling is a direct result of the human capital model. This is consistent with Thurow (1969) and Griliches and Mason's (1972) findings that the logarithmic dependent variable best fits the data on education, experience, and earnings. Card and Krueger (1992) and Heckman and Polachek (1974) provide additional evidence in favor of the log-linear relationship.

Analysis of earnings is restricted by the young ages of respondents, nearly thirty percent of whom are still in school full-time during Wave III (Table A); since those pursuing an education are less likely to be in the labor force, earnings are negatively correlated with

educational attainment in the full sample. I thus analyze the relationship between educational attainment and earnings using two smaller samples. I tabulate schooling by year of birth and find that most respondents born before 1979 are no longer in school. Sample A, then, consists of the 9,420 respondents born before 1979. This sample excludes some respondents already out of school, thereby limiting efficiency of the estimators; dropping respondents on the basis of age, however, engenders no selection bias. Sample B consists of the 10,765 respondents who, at the time of Wave III, self-report not being in school full-time. Although this sample yields more precise estimates, selecting on the basis of school attendance engenders some selection bias, especially since depression affects earnings in part through its effects on education. In Samples A and B reports of zero earnings provide valuable information about lack of involvement in gainful activity; I therefore choose to define the dependent variable as $\ln(1 + \text{personal earned income})$ instead of $\ln(\text{personal earned income})$ because the latter definition would necessitate dropping all respondents with zero earned income. Let $\ln E$, then, denote the natural log of $(1 + \text{personal earned income})$ (Table A).

Table A: Corroborating Linkages, Summary Statistics				
		Mean	Standard Error	Observations
1994 Depression	CES-D	13.28	9.52	20,641
	DepMild	0.17	0.37	20,641
	DepSevere	0.14	0.35	20,641
2001 Depression	CES-D	10.32	9.11	15,095
	DepMild	0.11	0.31	15,095
	DepSevere	0.09	0.29	15,095
Earnings	LnE in Sample A	7.12	3.81	9,420
	LnE in Sample B	7.25	3.85	10,765
Schooling	Educational Attainment (Years)	13.19	1.97	15,011
	School Full-Time	0.28	0.45	15,011
	School Part-Time	0.09	0.29	15,011

I analyze the correlation between adolescent depression and young adult depression by estimating regressions first with the binary variables

$$\textbf{Equation (1): } DepMild_{i,2001} = \sigma_o + \sigma_1 DepMild_{i,1994} + \sigma_2 DepSevere_{i,1994} + \sigma_3 X_i + U_i$$

$$\textbf{Equation (2): } DepSevere_{i,2001} = \alpha_o + \alpha_1 DepMild_{i,1994} + \alpha_2 DepSevere_{i,1994} + \alpha_3 X_i + U_i$$

where i indexes respondents and the vector X controls for race, gender, SES, and ability. It is plausible that adolescents with scores too low to be diagnosed with even mild depression may nonetheless have a higher probability of adult depression; I thus estimate a model with depression measured continuously

$$\textbf{Equation (3): } Dep_{i,2001} = \rho_o + \rho_1 Dep_{i,1994} + \rho_3 X_i + U_i$$

I find $\sigma_1, \sigma_2, \alpha_1, \alpha_2$, and ρ_1 all greater than zero at the one-percent significance level, confirming Garrison *et al.*'s (1997) findings that depression is recurrent and thus that adolescent depression is predictive of young adult depression (Table B).

Using the available data on young adult earnings, I next regress

$$\textbf{Equation (4): } \ln E_{i,2001} = \theta_o + \theta_1 Dep_{i,2001} + \theta_4 K_i + U_i$$

where the vector K controls for race, gender, SES, ability, and educational attainment. With both Samples A and B, I find that young adult depression is negatively correlated with $\ln E$ at the one-percent significance level (Table B). Consistent with the literature, then, I find that the negative correlation between adolescent depression and young adult earnings acts in part through the positive correlation between adolescent depression and young adult depression and, in turn, through the negative correlation between young adult depression and young adult earnings.

Returning to the full sample of 15,011 observations and regressing

$$\textbf{Equation (5): } EdAttain_i = \tau_o + \tau_1 Dep_{i,1994} + \tau_2 Y_i + U_i:$$

where the vector Y controls for race, gender, SES, ability, and age, I find $\tau_1 < 0$ at the one-percent significance level ($\tau_1 = -0.0329$, standard error 0.0017). This holds when controlling not only for gender, race, SES, and ability, but also for depression in young adulthood (Equation 7, Table B). These estimates confirm Asarnow *et al.* (2005), Currie and Stabile (2007), and Berndt *et al.*'s (2000) findings that adolescent depression is negatively correlated with educational attainment.

To study the relationship between educational attainment and earnings, I then estimate the model

$$\textbf{Equation (7): } \ln E_{i,2001} = \mu_o + \mu_1 EdAttain_i + \mu_2 Y_i + U_i$$

I find that an additional year of education is correlated with approximately nine percent higher earnings in Sample A and seventeen percent higher earnings in Sample B (standard errors 0.0194 and 0.0200, respectively) (Table B). Indeed, individuals depressed in adolescence seem to earn less in young adulthood in part because they have lower educational attainment, which is, in turn, correlated with lower earnings.

Table B: Corroborating Linkages, Results

Coefficients on and Standard Errors (in parentheses)								
Explanatory Variable	Sample (Obs)	Mild Young Adult Depression (1)	Severe Young Adult Depression (2)	Young Adult CES-D (3)	lnE (4)	Educational Attainment (5)	Educational Attainment (6)	lnE (7)
Mild Adolescent Depression	Full (15,011)	0.0601*** (0.0081)	0.0632*** (0.0071)					
Severe Adolescent Depression	Full (15,011)	0.1080*** (0.0092)	0.1454*** (0.0091)					
Adolescent CES-D	Full (15,011)			0.2940*** (0.0090)		-0.0329*** (0.0017)	-0.0257*** (0.0018)	
Young Adult CES-D	Full (15,011)						-0.0251*** (0.0017)	
	A (9,420)				-0.0229*** -0.00439			
	B (10,765)				-0.0228*** (0.0040)			
Educational Attainment	A (9,420)							0.0907*** (0.0194)
	B (10,765)							0.1689*** (0.0200)

(***) Estimates are significant at the 1% significance level

Results of the Add Health surveys, then, are consistent with previous findings that adolescent depression is correlated with lower young adult earnings in part through its positive correlation with young adult depression and in part through its negative correlation with educational attainment. The latter has been interpreted as indicating that the lower average educational attainment among individuals depressed in adolescence restricts their development of human capital. As Berndt *et al.* (2000) note,

“The clinical trial data provides strong empirical support for the hypothesis that early-onset major depressive disorder adversely affects the final educational attainment. . . . The negative educational attainment effect for women constitutes one form of lost human capital from early-onset major depressive disorder. . . . While employment rates for patients with early- and late-onset major depressive disorder were similar, the reduced

educational attainment of women with early-onset major depressive disorder results in lower expected income.”

The view that lower educational attainment among individuals depressed in adolescence results in lower expected income, however, relies on a key assumption; it assumes that, for the depressed individual in particular, continuing in school has not only positive returns, but also more substantial returns than does the relevant alternative. I turn now to a test of this assumption.

Testing the Assumption, Methodology and Results:

First, abstracting from the alternatives to educational attainment, I test if the returns to education are positive for depressed individuals. Positive returns to education for the average individual have repeatedly been shown empirically (Becker, 1964; Card, 1995); positive returns for the depressed individual, however, have not. Second, I note that positive returns to education do not suffice to show that depressed individuals would benefit from staying in school; rather, the returns to educational attainment must exceed the returns to its relevant alternative. After showing that it is valid to treat work experience as a relevant alternative to educational attainment, I compare the returns to work experience and educational attainment for those depressed in adolescence with the returns to each for their non-depressed peers. I estimate two models. First, defining depression in adolescence as a continuous random variable, I estimate

$$\begin{aligned} \textbf{Equation (8), Model 1: } \ln E_{i,2001} \\ = \psi_0 + \psi_1 Dep_{i,1994} + \psi_2 EdAttain_i + \psi_3 EdAttain_i Dep_{i,1994} \\ + \psi_4 Work_i + \psi_5 Work_i Dep_{i,1994} + \psi_6 X_i + U_i \end{aligned}$$

Second, defining depression in adolescence as two binary variables, one each for mild and severe depression, I estimate

Equation (9), Model 2: $\ln E_{i,2001}$

$$\begin{aligned}
 = & \omega_0 + \omega_1 DepMild_{i,1994} + \omega_2 DepSevere_{i,1994} + \omega_3 EdAttain_i \\
 & + \omega_4 EdAttain_i DepMild_{i,1994} \\
 & + \omega_5 EdAttain_i DepSevere_{i,1994} + \omega_6 Work_i \\
 & + \omega_7 Work_i DepMild_{i,1994} + \omega_8 Work_i DepSevere_{i,1994} + \omega_9 X_i + U_i
 \end{aligned}$$

I estimate both models using Samples A and B.

A full test of the assumption that returns to education are positive for depressed individuals in particular necessitates empirical examination of the absolute returns to education using the depressed sample. Given the short time frame of reported earnings in the currently available Add Health data set, however, estimates of the absolute returns to education would hold only limited long-run validity. Subsequent waves of Add Health data, collected when most respondents have completed their lifetime educational attainment, will be better suited to illuminate such returns.

Although estimation of absolute returns exceeds the scope of the currently available data, determination of the relative returns to education for individuals depressed in adolescence as compared to their non-depressed peers is feasible, particularly when analysis is performed using samples of older respondents and of respondents no longer in school. Estimates of the relative returns, moreover, allow for study of any comparative advantages among those with certain levels of depressive symptomology. The results of Models 1 and 2 using both Samples A and B reveal a positive correlation between educational attainment and $\ln E$ for the average, non-depressed respondent ($\psi_2 = 0.0726$, standard error 0.0307 and $\psi_2 = 0.0875$, standard error 0.0308 in Samples A and B, respectively; $\omega_3 = 0.0807$, standard error 0.0221 and $\omega_3 = 0.1043$, standard error 0.0222 in Samples A and B, respectively).

Given that a regression of GPA on adolescent depression, controlling for race, gender, SES, and ability, reveals that a score ten-points higher on the CES-D scale is correlated with 0.2 lower GPA (coefficient -0.01872, standard error 0.0007), one might expect ψ_3 , ω_4 , and ω_5 all less than zero, indicating that individuals depressed in adolescence have lower returns to education. I find, however, that none of these three coefficients is statistically significantly different from zero in either sample (Table C). As discussed, the literature has consistently shown positive returns to education for the general population (Becker, 1964; Card, 1995); given that depressed adolescents have approximately equal returns to schooling as compared to their non-depressed peers, then, the assumption that depressed adolescents have positive returns to educational attainment is consistent with the data.

Table C: Testing the Assumption, Models 1 and 2

		Coefficients on lnE	
Model	Explanatory Variable	Sample A (9,420 obs)	Sample B (10,765 obs)
1	Depression (Dep)	-0.0560** (0.0266)	-0.0795*** (0.0243)
	Educational Attainment (EdAttain)	0.0726** (0.0307)	0.0875*** (0.0308)
	EdAttain*Dep	-0.0003 (0.0018)	0.0014 (0.0018)
	Work Experience (Work)	0.5842*** (.0522)	0.4743*** (0.0438)
	Work* Dep	0.0127*** (0.0028)	0.0132*** (0.0024)
	Prob> F for null Work*Dep- EdAttain*Dep=0	0.0001	0.0003
2	Mild Depression (DepMild)	0.2011 (0.7634)	-0.8520 (0.6776)
	Severe Depression (DepSevere)	-0.9422 (0.7259)	-1.2872* (0.6585)
	Educational Attainment (EdAttain)	0.0807*** (0.0221)	0.1043*** (0.0222)
	EdAttain*DepMild	-0.0005 (0.0515)	0.0659 (0.0522)
	EdAttain*DepSevere	-0.0452 (0.0508)	-0.0251 (0.0509)
	Work Experience (Work)	0.7196*** (0.0383)	0.6046*** (0.0315)
	Work*DepMild	-0.0532 (0.0806)	-0.0020 (0.0653)
	Work*DepSevere	0.3403*** (0.0748)	0.3520*** (0.0652)
	Prob> F of null Work*DepMild- EdAttain*DepMild=0	0.5872	0.4500
	Prob> F of null Work*DepSevere- EdAttain*DepSevere=0	0.0000	0.0000
(***) Estimates are significant at the 1% level; (**) estimates are significant at the 5% level; (*) estimates are significant at the 10% level.			

Second, I test if continuing in school is more beneficial than the relevant alternative among those depressed in adolescence. Although work experience and educational attainment are sometimes pursued simultaneously, it is valid to treat work experience as a relevant alternative to schooling. A full test of the extent to which work experience and educational attainment are substitutes in each year from 1995 to 2001 is not feasible since the Add Health data has a direct measure only of whether a respondent was working in each year, and not of whether he was in school; both variables are, however, available for 2001. I thus estimate

$$\textbf{Equation (10): } Work_{i,2001} = \eta_o + \eta_1 SchoolFull_{i,2001} + \eta_2 R_i + U_i$$

where the vector R controls for gender, race, SES, ability, and depression in both periods. I find, as expected, that full-time school attendance is negatively correlated with employment at the one-percent significance level; specifically, respondents in school full-time at the time of Wave III are forty percent less likely simultaneously to be working ($\eta_1 = -0.3921$, standard error 0.0126).

Work experience is an alternative to educational attainment not only in the full sample, but also in the depressed sample in particular. I twice estimate

$$\textbf{Equation (11): } WorkX = \lambda_o + \lambda_1 Dep_{i,1994} + \lambda_2 X_i + U_i$$

for each year $X = [1995, 1996, (\dots), 2000]$, once controlling only for race, gender, SES, ability, and age, and once when controlling also for educational attainment. In the later case, λ_1 is significantly larger than in the former case, indicating that the higher work experience of depressed adolescents is directly related to their lower educational attainment (Table D). Justification for the view that depressed adolescents should stay in school, then, necessitates evidence that, for depressed individuals in particular, educational attainment is more rewarding than the relevant alternative of work experience.

Table D: Adolescent Depression and Work Experience						
	Coefficient and Standard Error (in parentheses)					
Variable	Work95	Work96	Work97	Work98	Work99	Work00
Dep1 (1)	0.0037*** (0.0004)	0.0029*** (0.0004)	0.0017*** (0.0004)	0.0007*** (0.0003)	-0.0002 (0.0003)	-0.0006** (0.0003)
Dep1 (2)	0.0045*** (0.0004)	0.0038*** (0.0004)	0.0023*** (0.0004)	0.0011*** (0.0003)	0.0000 (0.0003)	-0.0003 (0.0003)
(***) Estimates are significant at the 1% level; (**) estimates are significant at the 5% level. Results based on 15,011 observations The control variables in (1) are gender, race, SES, ability, and age; in (2), the control variable of educational attainment is appended to the preceding list.						

I now compare the returns to an additional year of schooling with the returns to an additional year of work experience for individuals depressed in adolescence. As discussed with regards to estimating the absolute returns to schooling, empirical challenges in estimating the absolute returns to work experience abound; nonetheless, as before, it is feasible to estimate the returns to work experience for depressed adolescents using as a base value the returns to work experience for their non-depressed peers. Note, however, that these comparisons are still based on the short-run returns in the young adult labor market; release of the Wave IV data set will provide insight into longer-term returns.

In Samples A and B I find, as expected, a positive correlation between work experience and $\ln E$ ($\psi_4=0.5842$, standard error 0.0522 and $\psi_4=0.4743$, standard error 0.0438 in Samples A and B, respectively; $\omega_6=0.7196$, standard error 0.0383 and $\omega_6=0.6046$, standard error 0.0315 in Samples A and B, respectively). Of particular interest, I find also that individuals depressed in adolescence have higher returns to work experience than do their non-depressed peers. In both samples, the results of Model 1 indicate that a ten-point higher CES-D score in adolescence is correlated with about thirteen percent higher young adult earnings returns to each year of work

experience. The coefficient of this interaction term is significant at the one-percent level ($\psi_5=0.0127$, standard error 0.0028 and $\psi_5=0.0132$, standard error 0.0024 in Samples A and B, respectively). Additionally, the results of Model 2 indicate that, although respondents with mild adolescent depression have approximately equal returns to work experience as compared to those with no depressive symptomology, respondents with severe adolescent depression have about thirty-five percent higher young adult earnings returns to each year of work experience ($\omega_7=-0.0532$, standard error 0.0806 and $\omega_7=-0.0020$, standard error 0.0653 in Samples A and B, respectively; $\omega_8=0.3403$, standard error 0.0748 and $\omega_7=0.3520$, standard error 0.0652 in Samples A and B, respectively)

To illuminate the time frame in which these higher returns to work experience are accrued by those depressed in adolescence, I next regress

$$\begin{aligned} \textbf{Equation (12): } \ln E_{i,2001} = & \beta_0 + \beta_1 Dep_{i,1994} + \beta_2 EdAttain_i + \beta_3 EdAttain_i Dep_{i,1994} + \\ & \beta_4 Work95_i + \beta_5 Work96_i + \\ & \beta_6 Work97_i + \beta_7 Work98_i + \beta_8 Work99_i + \beta_9 Work00_i + \beta_{10} Work95 * Dep_{i,1994} + \beta_{11} Work96 * \\ & Dep_{i,1994} + \beta_{12} Work97 * Dep_{i,1994} + \beta_{13} Work98 * Dep_{i,1994} + \beta_{14} Work99 * \\ & Dep_{i,1994} + \beta_{15} Work00 * Dep_{i,1994} + \beta_{16} X_i + U_i \end{aligned}$$

Although the estimated values of $\beta_{11}, \beta_{12}, \beta_{13}, \beta_{14}$, and β_{15} are all positive, the estimated value of β_{10} is slightly negative in both samples and none of these coefficients is statistically significant. I do, however, fail to reject the null that $\beta_{10} = \beta_{11} = \beta_{12} = \beta_{13} = \beta_{14} = \beta_{15}$ in both Samples A and B, evidence that adolescent depression does not merely temporarily increase the labor-market returns to work experience, but rather may create sustained higher returns ($F(5, 9391)=0.94$, $\text{Prob}>F=0.4522$ and $F(5, 10,733)=1.90$, $\text{Prob}>F=0.0902$ for Samples A and B, respectively). The higher returns to work experience among those depressed in adolescence for

at least the five years following a depressive episode may partially justify the decision of individuals depressed in adolescence to enter the work force instead of pursuing additional years of education.

Having found empirically that individuals depressed in adolescence have equal young adult earnings returns to educational attainment and higher young adult earnings returns to work experience as compared to their non-depressed peers, I next perform F-tests on the coefficients of these interaction terms. With Model 1, I reject the null that $\psi_3 = \psi_5$ in favor of the alternative $\psi_3 < \psi_5$. This result holds with both Samples A and B at the one-percent significance level. With Model 2, I fail to reject the null that $\omega_4 = \omega_7$; meantime, I reject the null that $\omega_5 = \omega_8$ in favor of the alternative that $\omega_5 < \omega_8$. Those with severe depression in adolescence, then, have a comparative advantage in the acquisition of human capital through work experience over their peers with mild or low levels of adolescent depressive symptomology. While the Add Health data reveals that the returns to educational attainment are approximately equal for those depressed and not depressed in adolescence, evidence that depression is correlated with higher returns to work experience calls into question the assertion that depressed adolescents who choose to work would benefit from instead staying in school (Berndt *et al.*, 2000).

Note that the positive correlation between adolescent depression and returns to work experience does not imply that each individual depressed in adolescence would have higher returns to work experience than his non-depressed peer; the correlation need not be taken as indication of a causal relationship. I have controlled manually for race, gender, SES, educational attainment, and ability across individuals, but a host of confounding variables could be cited. One could argue, for example, that working amid depression is correlated with the more general

personality trait of persistence, and that this persistence – and not the depressive episode – results in higher returns to work experience.

Testing the Assumption on Subsamples, Methodology and Results:

Having found a comparative advantage in the acquisition of human capital through work experience for those with severe depression in adolescence using Samples A and B, I turn now to a similar analysis using subsamples. I focus on Model 2 in order to illuminate the relationship between severe depression in particular and the returns to educational attainment and work experience; I use Sample A to minimize selection bias, separating the sample by gender, race, and SES.

Analyzing the Add Health data, Fletcher (2007) finds no statistically significant relationship between adolescent depression and educational attainment among males, but finds that female adolescents with depression are 3.5 percentage points less likely to graduate from high school as compared to those without depression; this is consistent with previous findings that depression primarily affects female educational attainment (Berndt *et al.*, 2000; Ding *et al.*, 2006). In light of these findings, I test if there are gender differences in the relative returns to educational attainment and work experience for those depressed in adolescence. To that end, I re-estimate Model 2 using each of two approximately equally-sized subsamples. The first is comprised of the male respondents in Sample A; the second, of the female respondents.

With the male subsample, I am unable to reject at the ten-percent significance level the null that the returns to work experience are equal across levels of depressive symptomology ($\omega_8 = 0.1963$, standard error 0.1323). In the female subsample, however, I find that those severely depressed in adolescence have higher returns to work-experience at the one-percent significance level ($\omega_8 = 0.4476$, standard error 0.0937); specifically, severely depressed

females have about forty-five percent higher young adult earnings returns to each year of work experience as compared to their female peers with lower depressive symptomology. Similarly, I am unable to reject at the five-percent significance level the null that $\omega_5 = \omega_8$ in the male sample (Prob > F 0.0685); meanwhile, I find ω_8 statistically significantly larger than ω_5 in the female sample at the one-percent significance level (Prob > F 0.0000). The stronger link between adolescent depression and lower educational attainment in females, then, is consistent with their higher relative returns to work experience (Table E1).

Table E1: Testing Assumptions, Model 2, Gender Subsamples			
	Coefficients on lnE, Sample A		
Explanatory Variable	All (9,420 obs)	Male (4,604 obs)	Female (4,810 obs)
Mild Depression (DepMild)	0.2011 (0.7634)	0.5750 (1.2449)	0.0981 (0.9961)
Severe Depression (DepSevere)	-0.9422 (0.7259)	0.0982 (1.2505)	-1.1582 (0.9357)
Educational Attainment (EdAttain)	0.0807*** (0.0221)	0.0382 (0.0296)	0.1317*** (0.0333)
EdAttain*DepMild	-0.0005 (0.0515)	-0.0424 (0.08498)	0.0068 (0.0671)
EdAttain*DepSevere	-0.0452 (0.0508)	-0.0850 (0.0943)	-0.0583 (0.0662)
Work Experience (Work)	0.7196*** (0.0383)	0.7785*** (0.0538)	0.6481*** (0.0546)
Work*DepMild	-0.0532 (0.0806)	-0.0132 (0.1238)	-0.0496 (0.1073)
Work*DepSevere	0.3403*** (0.0748)	0.1963 (0.1323)	0.4476*** (0.0937)
Prob> F of null Work*DepMild- EdAttain*DepMild=0	0.5872	0.8436	0.6675
Prob> F of null Work*DepSevere- EdAttain*DepSevere=0	0.0000	0.0685	0.0000
(***) Estimates are significant at the 1% level; (**) estimates are significant at the 5% level; (*) estimates are significant at the 10% level.			

Fletcher finds not only that adolescent depression is negatively correlated with the educational attainment of females in general, but also that it is most strongly negatively correlated with the educational attainment of white females from high SES families in particular. Noting that these results are unexpected, Fletcher hypothesizes, “It could be the case that some females in wealthy families take time off between high school and college if they have depressive symptoms. . . . These findings deserve to be the subject of future work.” To test if a more empirical explanation for the lower educational attainment among white females from relatively affluent families could lie in differences in the relative returns to education and work experience not only for females, but also for white and affluent individuals, I re-estimate Model 2 separating Sample A by race and SES as well.

I find, indeed, that the comparative advantage in work experience for individuals severely depressed in adolescence is most pronounced in the race subsample of non-Hispanic white respondents. Severely depressed non-Hispanic white respondents have about sixty-two percent higher earnings returns to each year of work experience as compared to their non-depressed peers of the same race. I find that ω_8 is not statistically significantly larger than ω_5 in the non-Hispanic black or non-Hispanic Asian samples; in the Hispanic sample, in contrast, I reject the null that they are equal in favor of the alternative $\omega_8 > \omega_5$ at the five-percent significance level; in the non-Hispanic white sample, I reject the null at the one-percent significance level (Table E2).

Table E2: Testing Assumptions, Model 2, Race Subsamples				
	Coefficients on lnE, Sample A			
Explanatory Variable	Hispanic (1,726 obs)	Non- Hispanic White (4,904 obs)	Non- Hispanic Black (1,950 obs)	Non- Hispanic Asian (827 obs)
Mild Depression (DepMild)	-0.1641 (1.8512)	0.7491 (1.1061)	1.7596 (1.6584)	-1.8527 (2.7879)
Severe Depression (DepSevere)	-1.8978 (1.7333)	-3.1135*** (0.9890)	1.6306 (1.7277)	-2.8339 (2.6047)
Educational Attainment (EdAttain)	0.0605 (0.0620)	0.0649** (0.0271)	0.1918*** (0.0542)	-0.1732* (0.0898)
EdAttain*DepMild	-0.0010 (0.1376)	0.0040 (0.0693)	-0.0837 (0.1200)	0.2246 (0.1709)
EdAttain*DepSevere	0.0062 (0.1243)	0.0040 (0.0667)	-0.1597 (0.1294)	0.1876 (0.1736)
Work Experience (Work)	0.7113*** (0.0941)	0.6408*** (0.0558)	0.7587*** (0.0777)	0.7894*** (0.1191)
Work*DepMild	0.0517 (0.1790)	0.1252 (0.1336)	-0.1112 (0.1491)	-0.4279* (0.2574)
Work*DepSevere	0.4697*** (0.1599)	0.6198*** (0.1106)	0.1873 (0.1574)	-0.0887 (0.2344)
Prob> F of null Work*DepMild- EdAttain*DepMild=0	0.8252	0.4236	0.8880	0.0189
Prob> F of null Work*DepSevere- EdAttain*DepSevere=0	0.0227	0.0000	0.1019	0.3571
(***) Estimates are significant at the 1% level; (**) estimates are significant at the 5% level; (*) estimates are significant at the 10% level.				

Dividing Sample A on the basis of SES, moreover, reveals that the comparative advantage for depressed adolescents through the acquisition of work experience is most pronounced at high levels of SES. Creating three approximately equally-sized subsamples, I define low SES as average parental educational attainment below a high school degree, middle SES as average parental educational attainment between a high school degree and some college,

inclusive, and high SES as average parental educational attainment of a college degree or above. I find that I am unable to reject the null that the relative returns to work experience and educational attainment are equal in the low and middle SES subsamples at the ten-percent significance level. I do, however, reject the null that they are equal in favor of the alternative that severely depressed adolescents have higher returns to work experience in the high SES subsample at the one-percent significance level (Table E3). Consistent with Fletcher's findings that the strongest negative correlation between adolescent depression and educational attainment exists among white females from affluent families, then, I find that the highest relative returns to work experience for those with severe adolescent depression exist among females, non-Hispanic whites, and individuals of high SES.

Table E3: Testing Assumptions, Model 2, SES Subsamples			
	Coefficients on lnE, Sample A		
Explanatory Variable	Low SES (3,871 obs)	Middle SES (2,999 obs)	High SES (2,544 obs)
Mild Depression (DepMild)	0.7253 (1.2012)	0.9193 (1.4595)	-0.8978 (1.5314)
Severe Depression (DepSevere)	-1.9060* (1.0490)	0.6205 (1.5700)	-1.0103 (1.3826)
Educational Attainment (EdAttain)	0.0958** (0.0386)	0.0616 (0.0397)	0.0529 (0.0414)
EdAttain*DepMild	-0.0269 (0.0900)	-0.0240 (0.0940)	0.0480 (0.0963)
EdAttain*DepSevere	0.0542 (0.0797)	-0.1051 (0.0998)	-0.0838 (0.0915)
Work Experience (Work)	0.8958*** (0.0605)	0.6257*** (0.0690)	0.5778*** (0.0696)
Work*DepMild	-0.9901 (0.1197)	-0.1703 (0.1566)	0.0844 (0.1534)
Work*DepSevere	0.2860*** (0.1049)	0.1839 (0.1624)	0.4480*** (0.1414)
Prob> F of null Work*DepMild- EdAttain*DepMild=0	0.6482	0.4246	0.8368
Prob> F of null Work*DepSevere- EdAttain*DepSevere=0	0.1007	0.1140	0.0017
(***) Estimates are significant at the 1% level; (**) estimates are significant at the 5% level; (*) estimates are significant at the 10% significance level.			

Conclusion:

This study corroborates previous findings that the negative correlation between adolescent depression and young adult earnings works through adolescent depression's positive correlation with young adult depression and its negative correlation with educational attainment. It then calls into question the assumption implicit in the assertion that to maximize human capital, individuals depressed in adolescence should continue in school. Although I find that individuals depressed in adolescence have positive returns to education equivalent to those of their non-depressed peers, I also find that on the aggregate they have higher returns to work

experience than do respondents not depressed in adolescence. In particular, I find that the higher returns to work experience among those with severe adolescent depression are most pronounced among women, non-Hispanic whites, and individuals of high SES. Interestingly, the literature has found that it is precisely white, affluent females who experience the strongest negative correlation between adolescent depression and educational attainment (Fletcher, 2007).

Note that I compare not the absolute returns to educational attainment and to work experience, but rather the relative returns for individuals depressed in adolescence, taking as given the returns for their non-depressed peers. I select the relative analysis since, given the short time-span of the currently available longitudinal data, any attempt at an absolute comparison could well misrepresent long-run returns. Additional waves of Add Health will soon expand the data on earnings, thereby facilitating just such an analysis of eventual returns to education and to work experience. At that time, an analysis of the absolute returns will provide a more definitive understanding of the trade-offs between educational attainment and work experience for those depressed in adolescence.²

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Appendix 1: Original CES-D

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

Week	During the Past			
	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I did not feel like eating; my appetite was poor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I felt that I could not shake off the blues even with help from my family or friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I felt I was just as good as other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I had trouble keeping my mind on what I was doing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I felt depressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I felt that everything I did was an effort.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I felt hopeful about the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I thought my life had been a failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I felt fearful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My sleep was restless.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I was happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I talked less than usual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I felt lonely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. People were unfriendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I enjoyed life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I had crying spells.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I felt sad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I felt that people dislike me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I could not get "going."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

Source: National Institute for Mental Health

Appendix 2: Add Health Wave I Modified CES-D

Section 10: Feelings Scale

How often was each of the following true during the last week?

1. You were bothered by things that usually don't bother you. H1FS1
2. You didn't feel like eating, your appetite was poor. H1FS2
3. You felt that you could not shake off the blues, even with help from your H1FS3
family and your friends.
4. You felt that you were just as good as other people. H1FS4
5. You had trouble keeping your mind on what you were doing. H1FS5
6. You felt depressed. H1FS6
7. You felt that you were too tired to do things. H1FS7
8. You felt hopeful about the future. H1FS8
9. You thought your life had been a failure. H1FS9
10. You felt fearful. H1FS10
11. You were happy H1FS11
12. You talked less than usual. H1FS12
13. You felt lonely. H1FS13
14. People were unfriendly to you H1FS14
15. You enjoyed life. H1FS15
16. You felt sad. H1FS16
17. You felt that people disliked you. H1FS17
18. It was hard to get started doing things. H1FS18
19. You felt life was not worth living. H1FS19

Source: National Longitudinal Study of Adolescent Health Survey, Wave I

Omitted, but contained in the original CES-D: Your sleep was restless

Appendix 3: Add Health Wave III Abbreviated CES-D

Section 12: Social Psychology and Mental Health

Now, think about the past seven days. How often was each of the following things true during the past seven days?

- You were bothered by things that usually don't bother you. H3SP5
You could not shake off the blues, even with help from your family and your friends, during the past seven days. H3SP6
You felt that you were just as good as other people, during the past seven days. H3SP7
You had trouble keeping your mind on what you were doing, during the past seven days. H3SP8
You were depressed, during the past seven days. H3SP9
You were too tired to do things, during the past seven days. H3SP10
You enjoyed life, during the past seven days. H3SP11
You were sad, during the past seven days. H3SP12
You felt that people disliked you, during the past seven days. H3SP13

Source: National Longitudinal Study of Adolescent Health Survey, Wave III

Omitted, but contained in the original CES-D only: Your sleep was restless

Omitted, but contained in the original CES-D and the Wave I Feelings Scale: You didn't feel like eating, your appetite was poor; you felt hopeful about the future; you thought your life had been a failure; you felt fearful; you were happy; you talked less than usual; you felt lonely; people were unfriendly to you; it was hard to get started doing things; you felt life was not worth living.