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Long-Term Economic Costs of Psychological Problems During Childhood

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Abstract

Childhood psychological conditions including depression and substance abuse are a growing concern among American children, but their long-term economic costs are unknown. This paper uses unique data from the US Panel Study of Income Dynamics (PSID) following groups of siblings and their parents for up to 40 years prospectively collecting information on education, income, work, and marriage. Following siblings offers an opportunity to control for unobserved family and neighborhood effects. A retrospective child health history designed by the author was placed into the 2007 PSID wave measuring whether respondents had any of 14 childhood physical illnesses or suffered from depression, substance abuse, or other psychological conditions.

Large effects are found on the ability of affected children to work and earn as adults. Educational accomplishments are diminished, and adult family incomes are reduced by 20% or \$10,400 per year with \$18,000 less family household assets. Lost income is a partly a consequence of seven fewer weeks worked per year. There is also an 11 percentage point lower probability of being married. Controlling for physical childhood diseases shows that these effects are not due to the co-existence of psychological and physical diseases, and estimates controlling for within-sibling differences demonstrate that these effects are not due to unobserved common family differences.

The long-term economic damages of childhood psychological problems are large—a lifetime cost in lost family income of approximately \$300,000, and total lifetime economic cost for all those affected of 2.1 trillion dollars.

Keywords

children; economic cost; psychological health; USA; family income

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INTRODUCTION

This paper investigates the long-term economic costs during one's adult years of experiencing psychological conditions during childhood. Childhood psychological issues including depression and drug/alcohol abuse are a serious and growing concern among American children. It is estimated that 1-2% of children and 3-8% of adolescents suffer from depression (Prager, 2009). During childhood, males and females are equally affected, but during adolescence the female to male ratio shift to approximately 3:1, mirroring prevalence in adults (Prager, 2009). Between 1960 and 1975 there was also a shift to earlier age of onset of depression (Klearman & Weissman, 1989).

Stimulated by the work of Barker (1997), recent research has established evidence of a strong link between poor physical health during childhood and even in-utero to health and economic outcomes much later in adulthood (Case & Paxson, 2002; Case, Fertig, & Paxson, 2005; Currie & Stabile, 2003). Much less studied are long-term economic consequences of psychological conditions experienced during childhood. Such studies are difficult, as it simultaneously requires knowing that conditions existed during childhood and the ability to follow the same individuals from childhood into much of their adult life all the while measuring key adult economic outcomes of interest. Moreover, some effects attributed to childhood psychological conditions may instead reflect unmeasured difficulties in the family or neighborhood in which the children were raised. This research deals with both issues by capturing a significant part of the lifespan from childhood into mid-adulthood and by using sibling information to control for unobserved common family and neighborhood effects.

METHODS

Data

Our analysis is based on the Panel Study of Economic Dynamics (PSID), which has gathered 40 years of extensive economic and demographic data on a nationally representative sample of, at baseline, approximately 5,000 American families and eventually 35,000 individuals living in those families. Details on family and individual income and labor market activity have been obtained in each yearly wave since 1968. Starting in 1984, at five-year intervals until 1999, PSID asked questions to measure household wealth. Starting in 1997, PSID switched to a two-year periodicity, and wealth modules were included in the core interview. PSID is recognized as the premier American panel survey measuring several key dimensions of adult socio-economic status (SES) outcomes.

Two unique aspects of PSID permit a long-term perspective on estimating effects on adult SES of having psychological conditions during childhood. First, as part of its original design, PSID follows all family members of the 1968 baseline group as well as any new family members who were born subsequently so that all children of original PSID members and their siblings are also panel members. For PSID panel children, the full array of SES measures exists each year for themselves, the parental households from which they came, and their siblings when they became independent households. PSID offers a rare opportunity to model and control for observed and unobserved family background effects.

Second, a retrospective child health history designed by the first author was placed into the regular 2007 PSID wave (Smith, 2008). This history relied on Calendar Life History (CLH) methods to ask respondents whether and when they had in the years before age 17 any of 14 important childhood physical illnesses and whether before age 17 they suffered from (1) depression, (2) drug or alcohol abuse, or (3) other psychological conditions. Depression is the most common childhood psychological problem. Substance abuse and dependence are classified as mental disorders by DSM-IV-TR (American Psychiatric Association, 2000). Drug

and alcohol use causes biological processes in the brain that contribute to tolerance and dependence. Various areas are affected, particularly dopaminergic pathways beginning in the ventral tegmental area (VTA) and projecting to the extended amygdale (Sadock et al., 2009).

A specific set of markers for age of any residential moves, marital events of parents, and entry into different levels of schooling before age 17 were used as memory triggers to aid recall of timing of physical and psychological conditions during childhood. Smith (2008) showed that this instrument was very successful in matching known secular trends in childhood illnesses and that there was no evidence of backwards attribution of new episodes of adult health problems into childhood conditions (Smith, 2008). For example, adult respondents whose health deteriorated between waves of the PSID were no more likely than before to cite childhood health problems.

Our sample for this analysis consists of those children and their siblings of the original PSID families who were less than 16 years old in 1968 as well as any subsequently born children who were at least 25 years old by calendar year 2005 when economic outcomes (income, work, wealth, and education) used here were measured. Therefore, these children of the PSID families had to be born between 1952 and 1980 in order to be included in the analysis so in calendar year 2005 their ages ranged from 25 to 53 years old, and we can follow them into the middle aged years. There are 3,771 such PSID respondents who are in our OLS analyses. When we moved to the fixed effects within sibling models, we need at least two siblings in the data who were born between these years and are in the PSID. There are 2,457 such respondents.

Conceptual framework

This paper starts with the perspective that some key SES outcomes during adulthood are in part the consequence of events during one's childhood and that childhood psychological problems are one of the best examples of that link. Our primary interest involves examining the relationship between these childhood psychological problems and the amount of family income people enjoy as adults. Three intermediate pathways may be critical in understanding that link—the effect of these childhood psychological problems on (1) the amount of education achieved, (2) the probability that an individual marries and stays married, and (3) the amount of work that one can do. Therefore, we also estimate models of these three outcomes as well.

In our perspective, the main pathway through which childhood psychological problems affect adult SES is through psychological problems as an adult. Therefore, it would not be appropriate in our analysis to also control for adult psychological problems since that would be essentially controlling for the primary pathway through which the childhood psychological effects occur. If childhood psychological problems did not have much of an effect on adult psychological problems, then the estimated effects of childhood problems on adult SES adults would be correspondingly small. Our analysis can be thought of as a reduced form.

The link between childhood psychological problems and these SES outcomes are the consequence of many observable and unobservable attributes of childhood family background. While we can include many important direct measures of family background, it would be impossible to measure all the relevant ones. These unmeasured family effects are potentially an important source of bias since they are likely correlated both with childhood psychological problems and adult SES outcomes. Our data offer a unique opportunity to control for unmeasured family traits since all siblings from the original data are potentially included in its sampling frame. In this paper, we also estimate within-sibling fixed effects models that sweep out all measured and unmeasured common family and neighborhood background effects thereby lowering this source of bias.

Another advantage of our approach flows from investigating the relationship between psychological problems during childhood and measures of SES such as income and the extent of work much later during adulthood. By doing so, we may obtain a better handle on the very thorny issue of dual causation between psychological problems and adult SES outcomes (Kessler et al, 2001). For example, the strength of the precise pathways in the relationship between adult depression and adult work has been very difficult to pin down (Hamilton et al., 1997 Zimmerman et al, 2005). In our case, however, it would be difficult to argue that future work during adulthood affected depression as a child and it is much more likely to flow from depression to less work.

Measures

Our measures of childhood psychological conditions are based on respondent recall answers to questions about whether before age 17 they suffered from (1) depression, (2) drug or alcohol abuse, or (3) other psychological problems. We also combine these answers into a single question of any childhood psychological condition.

Our adult outcome measures are proxied by several salient measures of adult social SES—education attainment, income, weeks worked, and household wealth. Education is the number of years of schooling completed. Two income measures are used—family income and individual earnings. We measure family income in natural logs given the approximately log normal distribution of family income in the United States and measure individual earnings in absolute dollars given the large number of zeros for non-workers. Weeks worked are the number of weeks in the previous year, and wealth is the sum of all housing, car, business, and financial wealth owned by the family minus all associated debt. PSID's high-quality measurement of family wealth has been established in previous studies (Juster, Smith, & Stafford, 1999).

Some effects of depression and other psychological conditions may reflect the well-established association of depression with physical illness during childhood (Angold, Costello, & Erkanli, 1999; Kovacs, 1997). Reductions in adult SES may be due to those childhood diseases rather than childhood psychological conditions per se. To test this, we control in some models for whether respondents have any of the following illnesses during childhood—asthma, diabetes, respiratory disorders, speech impairment, allergic conditions, heart diseases, chronic ear problems or infections, epilepsy/seizures, severe headaches or migraines, gastrointestinal conditions, high blood pressure, difficulty seeing despite eyeglasses, mumps, measles and chicken pox.

Statistical Methods

We estimate two models for each adult SES outcome—ordinary least squares (OLS) and fixed effects within sibling models. Since unmeasured attributes of family, neighborhood, and environment in which people are raised may influence adult outcomes and may be correlated with psychological disorders during youth, OLS models may not yield unbiased estimates of effects of childhood psychological disorders. Fixed effect within sibling models sweep out common measured and unmeasured family, neighborhood, and environmental factors and thus control for this type of bias. In our models, standard errors are adjusted for intra-cluster correlation at the family level.

Besides a standard set of demographic controls (age quadratic to capture life-cycle and cohort effects), race (=1 if Black), Hispanic ethnicity (= 1 if Latino), and gender (=1 if female), all models include family background measures of PSID respondents (education of both mother and father, and average ln parental income during all years when child was less than 17 years old and the family was present in the PSID).

RESULTS

Figure 1 lists reported prevalence of childhood psychological conditions. Six percent of respondents reported some psychological condition as a child, 4% mentioned childhood depression, and one in 50 cited alcohol or drug abuse and another two percent mentioned other psychological problems as a child. Lower prevalence rates for alcohol or drug abuse and other psychological problems means there will be less statistical power in estimating their unique impact on adult SES. While prevalence is about twice as high if a sibling also has the condition, most psychological disorders occur for a single sibling in the family so within sibling estimation is certainly feasible. As expected given the secular increase in prevalence (Birmaher, Ryan, Williamson, Brent, Kaufman, Dahl et al., 1996; Klearman & Weissman, 1989), either through environmental factors or improved diagnosis, prevalence is higher among younger respondents in our sample. In our sample, among adults under age 40 and above age 25, 8.6% report some psychological condition with 6% mentioning childhood depression and 3% drug/alcohol abuse, consistent with prevalence measures obtained from non-recall data (Birmaher et al., 1996; Prager, 2009; Son & Kirchner, 2000).

Table 1 contains point estimates of effects of childhood psychological conditions on respondents' education and the ln of family income. Table 2 contains the estimated effects for individual earnings and weeks worked. The first two columns in each Table lists OLS models while the final two columns present within sibling models. In each Table, we provide separate estimates for the composite psychological measure and for the three sub-components individually—depression, alcohol or drug abuse, and other. Within each psychological category, estimated effects are presented using a model that includes all demographic controls and measured family background variables and for a model adding the complete list of possible childhood physical diseases. Differences between these models show whether adjusting for any possible childhood diseases alters estimated impacts of childhood psychological conditions. Differences between OLS and fixed effects models demonstrate whether adjusting for common observed and unobserved family and neighborhood effects alters estimated effects of childhood psychological conditions

Consider first estimated effects on years of schooling completed. Based on OLS models in Table 1, having any childhood psychological condition results on average in a decrease of about six-tenths of a year of schooling. In within-sibling models, estimated effects on education are almost half as large but still statistically significant. These lower within-sibling models estimated effects on education compared to the OLS models are consistent with psychological problems being correlated with unobserved family effects that increase the probability both that children have mental health issues as a child and lower education outcomes as adults.

Estimated reductions in years of schooling completed are greatest if the condition was drug or alcohol related (Kessler, Foster, Saunders, & Stang, 1995; Wichstrom, 1998). Drug/alcohol influences on education are about the same in within-sibling models suggesting that common unobserved family variables do not significantly affect the coefficients of substance abuse but apparently do alter those of depression and other psychological problems. None of these estimated reductions in education are significantly altered by including all childhood physical diseases in the model suggesting that these estimated effects are not simply due to the presence of physical childhood diseases that could be limiting educational accomplishments.

Our estimated effects of childhood psychological conditions on adult family income are large—a 35% lower adult family income in the OLS model. In contrast to schooling, estimated negative effects are more similar in OLS and within-sibling models. If one sibling had a psychological disorder during childhood and the other sibling did not, adult family income would be 29% lower for the sibling with the childhood condition. Among the three types of

childhood psychological problems, estimated negative effects appear to be much larger for those who suffered from depression as a child. Estimated effects are diminished somewhat when other childhood diseases are controlled for, indicating that physical health correlates of depression are a part but not the primary mechanism through which childhood psychological conditions operate. Expressed in absolute dollars, family income of the child with the psychological problem would in an average year be \$10,400 less than his/her sibling every year as an adult into their fifties.

With the exception of education where the within-sibling estimates are much lower, the within-sibling estimates are not that different from the OLS estimates for the other outcomes of interest. There are several possible explanations for this. One reason is that in within-sibling models, families with only one adult child in the PSID are excluded. If the effect of childhood health interacts positively with number of siblings, estimated mean impacts of childhood health must be larger in within-sibling models. To check, we re-estimated all OLS models in Table 1 and 2 using a sample of respondents who had at least one sibling. Estimated effects were not that different than those in Tables 1 and 2 so the different samples in the OLS and fixed effects models are unlikely to be an important reason.

Another reason is behavioral—children's education is much more in control of parents so their ability to engage in compensatory behavior in offsetting the impacts of poor health on one of their children is greater for adult education than for incomes of their children when they become adults (Becker & Tomes, 1976).

Some insight into the source of these family income reductions is provided by individual earnings and weeks worked models in Table 2. Childhood psychological conditions, and depression in particular, can affect energy levels often required for economic success, and difficulty working is a well established consequence of depression among adults (Kessler, Greenberg, Mickelson, Meneades, & Wang, 2001). One consequence of childhood psychological conditions is that adult earnings will be permanently lower—on average \$4,094 per year even after controlling for all other physical ailments during childhood and all common family and neighborhood background variables.

The weeks worked model demonstrates that an important source of income loss from childhood depression in particular is less time worked as an adult—on average almost a two month reduction in weeks worked and five and a half weeks in the within-sibling model. Depression and work are known to be related (Stewart, Ricci, Chee, Hahn, & Morganstein, 2003), and the direction of causality remains controversial. Since these psychological conditions occurred during childhood, in this case the direction of causation is most likely from depression to work rather than the reverse.

We also estimated separate models for the probability of not working at all in the previous year and the number of weeks worked conditional on working at least one week. The probability of working zero weeks increased by 11 percentage points, and conditional on working at least one week, the number of weeks worked declined by about two weeks. Thus, 75% of the labor supply reduction reflects an inability to work at all by those who had suffered childhood psychological conditions.

Since they can draw upon their assets, household income is an incomplete summary of economic resources available to individuals and families to meet their needs (Juster et al., 1999). Surveys with high-quality measurement of household wealth combined with these psychological and physical measures of childhood health are rare. Income reductions by themselves imply that individuals with these childhood problems would face difficulty in their ability to save and accumulate assets. Our estimates confirm that those with some type of psychological condition during childhood have on average \$17,534 less in household assets

after controlling for other childhood physical ailments and all common family and neighborhood background effects.

Marriage is another important pathway through which childhood psychological conditions may negatively alter adult economic prospects. We estimated models of the probability of being married with the same set of covariates. Having a childhood psychological condition when a sibling did not results in an 11 percentage point decrease in the probability of marriage—consistent with the much larger effects we estimate on family income than on individual earnings alone. Not only is the probability of being married reduced, but even if married the income of one's spouse is lower. Individuals with psychological conditions during childhood do not share equally in the economic and non-economic benefits associated with marriage (Waite, 1995; Christakis & Allison, 2006).

An important question not addressed by calendar year 2005 models is whether poor childhood psychological problems affects where one starts out as a young adult and whether there are incremental effects thereafter as a person ages. To address this question, we estimated two additional models for ln family income. The first examines estimated effects of childhood psychological problems at the beginning of adulthood which we define as age 25. The other estimates effects on the change in ln family income from age 25 to the respondent's age in calendar year 2005. In the second model, ln family income at age 25 is included as a predictor. As before, we estimated OLS and fixed effects variants of these models and estimated models with and without the controls for the childhood physical illnesses.

These results are contained in Table 3 using the same format as in Table 1 and Table 2 for having any childhood psychological problem and for childhood depression. For family income, we find that about half of the total effect is present at the beginning of adulthood at age 25 so that a significant part of the reduced family income were right there at the beginning of adulthood. However, this effect also then grows with age. With this data, of course, we cannot be certain whether this expanding effect with age represents a pure life-cycle aging effect or whether it also includes at least in part some combination of calendar year and cohort effects as well.

DISCUSSION

Reliable estimates of economic costs of childhood psychological problems have been limited due to the simultaneous absence of long-term panel data with high-quality economic measurement, the lack of control for unobserved background effects that may bias estimates, and an inability to disentangle separate effects of physical and mental childhood illnesses. By introducing a childhood recall model into the best American economic panel, this study makes a major step in resolving those limitations. A long-term prospective American cohort study with all this information contained within it does not exist, and we would have to wait 50 years or more to obtain the equivalent information even if it was started now. This combination of recall and prospective data appears to be the most productive research strategy at this time.

All studies have possible limitations and there are three that merit attention. PSID's strength as a long-term panel raises issues of attrition bias. Fortunately, among existing panel surveys, attrition is lower in the PSID than in the other surveys. Since 1969, annual attrition typically averages two or three percent per wave or less. While several studies evaluated whether the cumulative attrition that does exist leads to biased estimates and the universal answer has been that it does not (Beckett, Gould, Lillard, & Welch, 1988; Fitzgerald, Gottschalk, & Moffitt, 1998; Lillard & Panis, 1998), one must remain open to the possibility in this application.

Second, we rely on recall data on childhood psychological conditions. Recall data in our study matches known prevalence levels of physical and psychological prevalence of these childhood

illnesses in the past (Smith, 2009). While additional tests about reliability of recall data would certainly be welcome, these data appear to capture the main features of respondents childhood, albeit a period of life in which memory is known to be more accurate (Cohen, Kasen, Bifulco, Andrews, & Gordon, 2005).

On a related issue, childhood conditions were placed into three groups—depression, alcohol/drug, and other. For many purposes, one would like to separate the ‘other’ category into its specific disorder components. However, prevalence rates of many specific conditions (bipolar disorder, schizophrenia, specific phobias) during childhood would be low in a community based study such as this one. Thus, our analysis applies most directly to depression and substance abuse during childhood, two of the most important and prevalent childhood disorders.

Given that labor supply decisions and earnings of men and women are very different, it is possible that these effects of childhood psychological problems could differ by gender. With this in mind, we re-estimated all models in this paper separately by gender. To illustrate, we find that estimated effect of childhood psychological problems on family income is higher for men than for women in the order of a few thousand dollars and the effect on weeks worked is around one week larger for men compared to women. Unfortunately, by dividing the sample essentially in half, we no longer have the statistical power to convincingly test whether differences of this magnitude are actually statistically significant or not.

Finally, while an extremely rare and important analytical tool, within-family models are not a panacea for all sources of bias stemming from unmeasured family and background effects. As in all fixed effects models, non-common family effects that affected one sibling and not the other are not controlled nor are different susceptibilities of individual siblings to even common family or neighborhood effects.

Based on this data, we find large economic costs during adulthood of childhood psychological conditions. Reductions in family income are much larger than on education, which by themselves at conventional economic rates of return to schooling would only imply a 5% reduction in income. Three important pathways by which these psychological conditions apparently limit adult incomes are through increased problems in working, difficulty in finding or keeping a spouse and a lower earnings capacity of one’s eventual mate. These large economic costs are not primarily due to any concomitant physical illnesses during childhood or to the presence of common unmeasured family and neighborhood effects.

The principal transmission pathway through which childhood psychological conditions affected adult SES outcomes are psychological disorders as an adult. Among those with no psychological conditions during childhood, 5.4% of them reported contemporaneously in the PSID an adult psychological problem. In contrast, among those who did report a psychological condition during childhood, 35.8% reported an adult psychological condition—a seven times higher risk. Among those with childhood depression, 43.8% said they had a psychological problem as adults. For childhood drug and alcohol abuse, the comparable fraction was 32.7%. When asked to list the nature of their current physiological condition, 61% mentioned depression, 32% anxiety (panic), and 19% said bipolar disorder. While we do not know in the PSID whether or not respondents were treated for their psychological problems, many of them clearly carried these conditions with them into their adult years.

Our estimates imply that long-term economic damages of childhood psychological conditions are very large—a reduction in family income of about \$10,400, a loss that would be sustained on average through all adult years. Using a 3% real discount rate, this translates into a lifetime cost in lost family income for individuals affected of about \$300,000. If one in 20 adult Americans experienced these psychological problems during their childhood years (about the

current prevalence), total lifetime economic damages for all those affected would be 2.1 trillion dollars. This computation is likely a significant understatement since it ignores the non-economic costs associated with these psychological disorders to individuals who experienced them. It also ignores the significant positive social costs with mental illness as treating children effectively will likely benefit their parents, siblings, classmates, and neighbors.

A growing body of recent research investigating the Barker hypothesis has demonstrated that childhood illnesses often have a long-lasting legacy into adulthood. Most research has focused on enduring effects of childhood physical illness. This paper shows that these effects extend to childhood psychological illness as well. In some ways, such as their eventual economic costs, pathways related to childhood mental disorders are even more important. Effective treatments targeted to children that lower the risk of experiencing these psychological conditions or that mitigate their adult psychological and economic consequences are likely to long lasting payoffs and to be very cost-effective.

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References

- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. American Psychiatric Association; Washington, DC: 2000. Text Revision
- Angold A, Costello EJ, Erkanli A. Comorbidity. *Journal of Child Psychology and Psychiatry* 1999;40(1):57–87. [PubMed: 10102726]
- Barker DJP. Maternal nutrition, fetal nutrition and diseases in later life. *Nutrition* 1997;13(9):807–813. (1997). [PubMed: 9290095]
- Becker G, Tomes N. Child endowments and the quantity and quality of children. *The Journal of Political Economy* 1976;84:S143–S162.
- Beckett S, Gould W, Lillard L, Welch F. The Panel Study of Income Dynamics after fourteen years: An evaluation. *Journal of Labor Economics* 1988;6(4):472–492.
- Birmaher B, Ryan ND, Williamson DE, Brent DA, Kaufman J, Dahl RE, et al. Childhood and adolescent depression: A review of the past 10 years, Part 1. *Journal of the American Academy of Child and Adolescent Psychiatry* 1996;35(11):1427–1439. [PubMed: 8936909]
- Case A, Fertig A, Paxson C. The lasting impact of childhood health and circumstance. *Journal of Health Economics* 2005;24(2):365–389. [PubMed: 15721050]
- Case A, Lubotsky D, Paxson C. Economic status and health in childhood: The origins of the gradient. *American Economic Review* 2002;92(5):1308–1334.
- Christakis NA, Allison PD. Mortality after the hospitalization of a spouse. *New England Journal of Medicine* 2006;354(7):719–730. [PubMed: 16481639]
- Cohen P, Kasen S, Bifulco A, Andrews H, Gordon K. The accuracy of adult narrative reports of developmental trajectories. *International Journal of Behavioral Development* 2005;29(5):345–355.
- Currie J, Stabile M. Socioeconomic status and child health—Why is the relationship stronger for older children? *American Economic Review* 2003;93(5):1813–1823.
- Fitzgerald J, Gottschalk P, Moffit R. An analysis of sample attrition in panel data: The Michigan Panel Study of Income Dynamics. *Journal of Human Resources* 1998;33(2):251–299.
- Hamilton VH, Merrigan P, Dufresne E. Down and out: Estimating the relationship between mental health and unemployment. *Health Economics* 1997;6(4):397–406. [PubMed: 9285232]
- Juster FT, Smith JP, Stafford F. The measurement and structure of household wealth. *Labour Economics* 1999;6(2):253–275.
- Kessler RC, Foster C,L, Saunders W,B, Stang PE. Social consequences of psychiatric disorders, I: Educational attainment. *American Journal of Psychiatry* 1995;152(7):1026–1032. [PubMed: 7793438]

- Kessler R, Greenberg PE, Mickelson K, Meneades L, Wang PS. The effects of chronic medical conditions on work loss and work cutback. *Journal of Occupational & Environmental Medicine* 2001;43(3): 218–225. [PubMed: 11285869]
- Klearman GL, Weissman MM. Increasing rates of depression. *Journal of the American Medical Association* 1989;261(15):2229–2235. [PubMed: 2648043]
- Kovacs M. Psychiatric disorders in youths with IDDM: Rates and risk factors. *Diabetes Care* 1997;20(1):36–44. [PubMed: 9028691]
- Lillard L, Panis C. Panel attrition from the Panel Study of Income Dynamics: Household income, marital status, and mortality. *Journal of Human Resources* 1998;33(2):437–457.
- Prager LM. Depression and suicide in children and adolescents. *Pediatrics in Review* 2009;30(6):199–205. [PubMed: 19487428]
- Sadock, BJ.; Sadock, VA.; Ruiz, P. Kaplan & Sadock's Comprehensive Textbook of Psychiatry. 9th ed. Lipincott, Williams and Wilkins; Philadelphia: 2009.
- Smith JP. Reconstructing childhood health histories. *Demography* 2008;46(2):387–403.
- Son SE, Kirchner JT. Depression in children and adolescents. *American Family Physician* 2000;62(10): 2297–2308. 2311–2312. [PubMed: 11126856]
- Stewart WF, Ricci JA, Chee E, Hahn SR, Morganstein D. Cost of lost productive work time among US Workers with depression. *JAMA* 2003;289:3135–3184. [PubMed: 12813119]
- Waite L. Does marriage matter? *Demography* 1995;32(4):483–508. [PubMed: 8925942]
- Wichstrom L. Alcohol intoxication and school dropout. *Drug and Alcohol Review* 1998;17(4):413–421. [PubMed: 16203508]
- Zimmerman FJ, Katon W. Socioeconomic status, depression disparities, and financial strain: What lies behind the income-depression relationship? *Health Economics* 2005;14(12):1197–1215. [PubMed: 15945040]

Figure 1.
Prevalence of Childhood Psychological Conditions

Table 1

Estimates of Impact of Childhood Psychological Problems on Adult Education and Family Income

	Education		Ln Family Income	
	OLS Estimates	Fixed Effects Estimates	OLS Estimates	Fixed Effects Estimates
Estimate for any childhood Psychological Problem				
Model Controlling for Family background	-0.568**	-0.319*	-0.351**	-0.291 ⁺
Also controlling childhood physical health problems	-0.590**	-0.374**	-0.287**	-0.250 ⁺
Estimate for childhood Depression				
Model controlling for Family background	-0.308*	-0.206	-0.373**	-0.445*
Also controlling childhood physical health problems	-0.313*	-0.265	-0.298*	-0.401 ⁺
Estimate for Drug/Alcohol				
Model controlling for Family background	-0.760**	-0.714**	-0.091	-0.242 ⁺
Also controlling childhood physical health problems	-0.781**	-0.721**	-0.079	-0.261 ⁺
Estimate for Other child Psychological Problem				
Model Controlling for Family background	-0.535*	-0.204	-0.190	0.321
Also controlling childhood physical health problems	-0.581*	-0.235	-0.130	0.355

All models control for age quadratic, gender, race, Hispanic, education of both parents, and parental income during childhood which we call "Family Background." Childhood health models add a set of controls for fifteen types of physical illnesses during childhood.

** We indicate levels of statistical significance by a for significant at 1% level

* for significant at 5% level

⁺ for significant at 10% level

Table 2

Estimates of Impact of Childhood Psychological Problems on Adult Earnings and Weeks Worked.

	<u>Individual Income</u>		<u>Weeks Worked</u>	
	OLS Estimates	Fixed Effects Estimates	OLS Estimates	Fixed Effects Estimates
Estimate for Any Child Psychological Problem				
Model controlling for Family background	-6,912**	-5,339**	-7.39**	-7.15**
Also controlling childhood physical health problems	-6,106**	-4,094**	-6.45**	-5.59**
Estimate for childhood Depression				
Model controlling for Family background	-5,221**	-2,851	-7.88**	-6.59*
Also controlling childhood physical health problems	-4,179*	-2,005	-6.64**	-5.29+
Estimate for Drug/Alcohol				
Model controlling for Family background	-4,918*	-3,544	-2.17	-5.29
Also controlling childhood physical health problems	-5,504*	-3,682	-1.79	-5.25
Estimate for Other child Psychological Problem				
Model controlling for Family background	-4,619*	-7,006+	-6.75*	-5.99
Also controlling childhood physical health problems	-4,039	-3,948	-6.92**	-3.84

All models control for age quadratic, gender, race, Hispanic, education of both parents, and parental income during childhood which we call "Family Background." Childhood health models add a set of controls for fifteen types of physical illnesses during childhood.

** We indicate levels of statistical significance by a for significant at 1% level

* for significant at 5% level

+ for significant at 10% level

Table 3

Estimates of Impact of Childhood Psychological Problems on Family Income at age 25 and from age 25 to year 2005

	<u>Ln Family Income Age 25</u>		<u>Ln Family Income from age 25 to 2005</u>	
	OLS Estimates	Fixed Effects Estimates	OLS Estimates	Fixed Effects Estimates
Estimate for any Child Psychological Problem				
Model controlling for Family background	-0.221 *	-0.283 **	-0.302 **	-0.293 +
Also controlling childhood physical health problems	-0.206 +	-0.208 +	-0.243 +	-0.269 +
Estimate for childhood Depression				
Model controlling for Family background	-0.278 *	-0.522 **	-0.358 *	-0.303 *
Also controlling childhood physical health problems	-0.266 +	-0.431 **	-0.279	-0.298

All models control for age quadratic, gender, race, Hispanic, education of both parents, and parental income during childhood which we call "Family Background." Childhood health models add a set of controls for fifteen types of physical illnesses during childhood.

** We indicate levels of statistical significance by a for significant at 1% level

* for significant at 5% level

+ for significant at 10% level