Youth & Society

Health in Early Adolescence and Paid Employment

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First Published November 11, 2020 | Research Article
https://doi.org/10.1177/0044118X20972425

Abstract

This study examines the relationship between health and adolescent employment. Using data from the Panel Study of Income Dynamics' Child Development Supplement and Transition into Adulthood Supplement, we examine a cohort of 2,925 youth who were followed from childhood into adolescence. We focus on two outcomes measured when sample members were ages 16, 17, and 18: employment status and average weekly hours worked. With these data, we test the hypothesis that youth with health conditions will be less likely to work and if they do work, they work fewer hours a week. We find mixed support for this hypothesis. Youth with sensory limitations, developmental disabilities, and externalizing problem behaviors are less likely to work than their peers without these conditions. However, conditional on being employed, youth with externalizing problem behaviors and ADHD work more hours a week than their peers without those conditions.

Keywords

adolescent health, employment, adolescence, work

A key developmental task in the transition from adolescence to adulthood is entry into the paid, formal labor force (Mortimer, 2003). Acquiring and maintaining a job fosters time management skills, personal accountability, proficiency in performing tasks, and practice in meeting the expectations of supervisors. In turn, these experiences help youth to establish economic independence from their parents and to become productive citizens. Because of the role that paid work can potentially play in promoting healthy youth

development when it is done in moderation and in an age-appropriate context (Mortimer, 2003), a large body of social science research has been devoted to understanding the antecedents to and the consequences of employment in the adolescent years (Bozick, 2006; Entwisle et al., 2000; Mortimer, 2003; Purtell & McLoyd, 2011; Ruhm, 1997; Schoenhals et al., 1998; Staff & Uggen, 2003; Staff et al., 2010; Warren & Lee, 2003). Noticeably absent from both the discourse and the empirics is health—which is surprising because youth's physical and mental health potentially affects their ability to acquire and to sustain employment. For example, youth with autism or impaired vision may struggle to find work that is appropriate given their unique limitations. Likewise, obese youth might be passed over for certain jobs or paid less because employers may perceive them to lack self-control, as has been demonstrated in research on the adult labor market (Baum & Ford, 2004; Flint et al., 2016). It is well documented that adults with health problems have difficulty finding and maintaining employment (Chirikos, 1993; Pelkowski & Berger, 2004), with more severe health problems often leading to reliance on disability insurance. If like relationships hold at earlier ages, then poor health in adolescence may constitute a developmental impediment that stunts foundational trajectories in the acquisition of human capital early in the life course.

The lack of research on the relationship between health and adolescent employment is surprising for two key reasons. First, unemployment, mental health problems, and obesity are increasingly prevalent conditions that affect teenagers (Child Trends, 2019; DeSilver, 2015), and so documenting their correlates and consequences is paramount for understanding contemporary adolescent development. Barriers to employment in adolescence are a particularly pressing concern given the lingering effects of the Great Recession: The 2010 summer employment rate of 16 to 19 year olds (28.6%) was the lowest ever recorded since the end of World War II (Sum et al., 2010). Since bottoming out in 2010, there has been little rebound in rates of youth employment (Fernandes-Alcantara, 2018), which are likely to be further suppressed due to the COVID-19 pandemic.

Historically, youth have been relegated to the "bottom of the occupational structure" where they are heavily concentrated in the low-wage service sector, mostly in food preparation, food service, and sales (Hirschman & Voloshin, 2007). Given the steep competition from both their healthy peers as well as from low-income adults for a limited number of positions in this sector, youth with health conditions are potentially at an even greater disadvantage when looking for work. While, on average, teenagers do not experience the degree of physical impediments to full-employment that afflict older adults, certain conditions—namely depression and obesity—are nearing record rates among the yo[illegible]

population: Nearly one-fifth of children have emotional difficulties, and nearly one-third are overweight (Child Trends, 2019).

The second reason the lack of research on the relationship between health and adolescent employment is surprising is that maintaining a job provides critical experiences that impart specific occupational knowledge, skills, and competencies as well as general workplace norms and expectations. This is particularly important for youth who do not pursue postsecondary education. While there is a general scientific consensus that holding a paid job in adolescence at 20 or more hours a week can impede short-term educational and developmental outcomes (Mortimer, 2003), employment in moderation, typically less than 20 hours a week during the school year, is associated with higher levels of educational attainment (Staff & Mortimer, 2007), employment in adulthood (Alon et al., 2001), and higher earnings in adulthood (Baum & Ruhm, 2016; Light, 2001; Ruhm, 1997). Should youth in poor health miss these key "capitalization experiences" they may face difficulties in establishing stable employment and economic independence from their parents in young adulthood.

Our study will help fill this void in the literature by examining the relationship between health in early adolescence and subsequent labor force participation. Early adolescence is a critical stage because it is during this time that youth begin developing the ability to think abstractly, to think long term, and to set occupational goals (Csikszentmihalyi & Schneider, 2000). Consequently, health disruptions during this volatile period could permanently alter behaviors, activities, and attitudes that serve as a foundation for a successful transition to adult roles. At the same time, chronic health conditions that emerge in early adolescence are generally persistent—across the remaining adolescent years and into adulthood (Van Cleave et al., 2010). To date, a number of studies show that poor health in childhood is associated with poor labor force outcomes in adulthood (Case et al., 2005; Smith, 2009), with the lag between the measurement of health and labor force outcomes spanning decades. In focusing on the linkages between health in early adolescence and work experience in the years immediately following, we can better trace the origins of these developmental processes as they take root early in the life course.

Specifically, our study will track the initial employment experiences of a cohort of children who came of age between the late 1990's and early 2000's in the United States. We focus on health in early adolescence as measured by an appraisal of overall health as well as a series of specific health domains that include autonomy limiting conditions, obesity, psychological and behavioral problems, and chronic conditions. For outcomes, we focus on whether or not the teenager was employed, which we disaggregate into employment

during the school year and employment during the summer. If employed at any point during the year, we examine the number of hours spent working, herein referred to as employment intensity. In what follows, we briefly describe previous research on these issues and derive hypotheses that we empirically test in our analysis.

Past Research and Hypotheses

The relationship between health and employment in adulthood is generally a bi-directional and mutually reinforcing one: Adults in good health are more likely to be in the labor force, and sustained employment in turn helps adults to maintain good health (Chirikos, 1993; McDonough & Amick, 2001; Pelkowski & Berger, 2004; Ross & Mirowsky, 1995). Despite an extensive body of literature on the topic, almost all of it has focused on older workers and/or workers with disabilities. Surprisingly little attention has been paid to whether and how these relationships develop earlier in the life course. A lone exception is Passmore et al.'s (1983) analysis of 16 to 21 year-olds in the National Longitudinal Survey of Youth 1979 cohort in which they find that sample members with self-reported health limitations were less likely to be employed, and if they were employed, worked fewer hours than their peers who reported no health limitations. Though restricted in their measures of specific conditions, they were able to discern that chronic diseases were more of an impediment to employment than acute conditions such as accidents and injuries. This study is now over 35 years old and was conducted in a decade when rates of certain health conditions among youth such as obesity and mental health problems were markedly lower. In our study we revisit the key findings from their analysis and extend them by examining a range of diagnosed health conditions.

In accord with the findings of Passmore and his colleagues as well as with research on adults, we hypothesize that when compared with their healthy peers, youth in poor health will be less likely to work. If they do work, we expect it to be at a low level of intensity. However, we also expect this relationship to vary according to the type of health condition. Most jobs held by teenagers are in the retail, food services, construction, and manufacturing industries (Ross & Svajlenka, 2015). Entry-level jobs in these industries typically require physical tasks (such as standing for extended periods of time, crouching, climbing, walking, and lifting), and in the case of retail and food services, sufficient communication skills. All jobs regardless of industry require a satisfactory level of attentiveness to detail, concentration, procedural recall, and impulse control. Given these requirements, we expect that the effects of health conditions will depend on their scope and severity.

First, research on the precursors to adolescent employment finds that youth who exhibit higher levels of autonomy are more likely to procure steady employment during adolescence than those who require more direct support and guidance from their families (Purtell & McLoyd, 2011). We contend that two types of health conditions—sensory limitations and developmental disabilities—distinctively limit autonomy and thus may preclude employment among adolescents who have these conditions. These youth may be unable to transport themselves to/from work, especially if the job requires driving or navigating complicated public transportation routes. Further, these conditions may impede the ability to execute certain tasks that are common in the teenage workplace. For example, youth with hearing impairments may struggle to take orders at restaurants and youth with vision problems might be less efficient in stocking shelves or operating equipment such as cash registers. Due to their difficulties in communicating as well as their predilection toward repetitive behaviors, youth with developmental disabilities such as autism may be unable to handle work that requires inter-personal adaptations to changing situations such as is the case when babysitting or dealing with unhappy customers. Therefore, our first hypothesis is:

> *H_1: Youth with sensory limitations and developmental disabilities will be less connected to the labor force during adolescence than their peers without these conditions.*

Second, over the past decade health professionals and policy makers have become concerned with the increasing rate of childhood obesity, which doubled in the past 30 years (Ogden et al., 2012). Clinical research finds that obese youth have a decreased attention span, less mental flexibility, and a smaller hippocampus which may impede recall of new information (Yau et al., 2012). While it is unlikely that these factors would appreciably impede youth's ability to work, especially given that most jobs undertaken by teenagers are not cognitively complex, it is possible that overweight youth might struggle to get hired. There is evidence showing that overweight adult job applicants are discriminated against when evaluated by prospective employers (Flint et al., 2016) and earn lower wages should they get hired (Baum & Ford, 2004). We anticipate that like adults, obese youth might have a difficult time getting hired because employers may perceive them to be lazy, lacking self-control, or unhealthy "ambassadors" of the particular business or brand. Our second hypothesis is:

> *H_2: Obese youth will be less connected to the labor force during adolescence than their non-obese peers.*

Third, psychological/behavioral problems, which, along with obesity, have garnered considerable public health attention due to their increasing prevalence among recent cohorts of adolescents (Mojtabai et al., 2016). Given the heterogeneous ways in which these problems shape the daily experiences of youth, their potential relationship with employment is not clear. On the one hand, youth with psychological/behavioral problems might exhibit an array of attributes—such as being withdrawn, inattentive, fidgety, slow to process information, aggressive, and/or confrontational—that would potentially discourage employers from hiring them and impede their ability to perform on the job should they get hired. Therefore, we might expect that:

> *H_{3a}: Youth with psychological/behavioral problems will be less connected to the labor force during adolescence.*

On the other hand, a consistent finding in the extant research on predictors of adolescent employment is that youth who are disengaged from school often invest their energies into paid work as a means to acquire relevant human capital outside the classroom (Mortimer, 2003; Schoenhals et al., 1998; Staff et al., 2010). Holding a job provides a productive outlet and a stepping-stone to stable employment after graduation for youth who struggle in school. For example, Schoenhals et al. (1998) found that eighth graders who exhibited disengagement such as coming to class unprepared or participating in deviant behaviors were more likely to hold jobs when they became 10th graders than their peers who were more academically engaged. Given that school disengagement is often (but not always) a symptom of broader psychological/behavioral problems, we offer an alternative hypothesis:

> *H_{3b}: Youth with psychological/behavioral problems will be more connected to the labor force during adolescence than their peers without these problems.*

Finally, throughout childhood, youth can acquire a range of chronic conditions that require treatment and ongoing managed care, including anemia, asthma, and diabetes. While these conditions may involve periodic doctor's office visits and ongoing treatments, if treated and under the care of medical practitioners they are unlikely to impinge on youth's ability to get hired and perform the work. Accordingly, we posit:

> *H_4: Youth with chronic conditions will be no more or less connected to the labor force than their peers without such conditions.*

Data

To test our hypotheses, we analyze data from two supplements to the Panel Study of Income Dynamics (PSID): the Child Development Supplement and the Transition into Adulthood Supplement, which together study the childhood and young adult period for a cohort of children growing up in PSID families. PSID is a longitudinal study of a representative sample of approximately 5,000 U.S. families that started in 1968. In PSID, a primary respondent in each family reports on themselves, their spouse/partner, and provides basic information about other family members on a biennial basis.

The PSID Child Development Supplement (PSID-CDS) began in 1997 with a sample of up to two children aged 0 to 12 years per family in PSID families. In the initial wave of the PSID-CDS, data were collected on 3,563 children through interviews with their primary caregivers producing a child-based response rate of 88%. The second wave was conducted in 2002 (with a 91% response rate) and the third wave in 2007 (with a 90% response rate). By the third wave, the sample was approximately between the ages of 10 and 22. In each wave, primary caregivers (typically a parent, and henceforth referred to as this) provided information about their child's health, as well as information about many other aspects of the child's development and the family environment. Children with severe health conditions that prevented or greatly limited their ability to participate in the study were typically excluded from the study's data collection process. This decision was usually made by the child's parent or guardian as part of the informed consent process, or in consultation with the interviewer based on the types of tasks children were asked to complete. Thus, our analysis of the PSID-CDS may understate the relationship between health and employment for those with extremely limiting health conditions.

Most youth in the PSID-CDS had one or more reports of their health status from their parents during early adolescence which we operationally define as between ages 11 and 15. Essentially all youth in the PSID-CDS have health measures collected during this age range, unless they were lost to attrition. A small number of sample members (64 of the 3,563) were observed only at ages 6 to 10 years. Thus, for the majority of our sample we have measures of health conditions in the 5 years immediately preceding age 16, which is the modal legal age of employment in the United States and the age at which we begin to observe employment outcomes for our sample. We control for the age when the health condition was observed in all of our multivariate models.

By design, the PSID-CDS tracks youth as they pass through the late adolescent years at different periods, with the oldest reaching age 16 in 2001 and the youngest reaching age 18 in 2015. Employment status is observed for all youth between ages 16 to 18, although children pass through those ages at different periods between 2001 and 2015. Of the

3,563 youth whose health status was observed in the first wave of PSID-CDS, we observe employment at least once between ages 16 to 18 for 2,925 sample members. These youth comprise our final analytic sample.

Measures

Health Status

We measure health status for our sample with a subjective appraisal of overall health, a series of diagnosed health conditions, an assessment of problem behaviors, and anthropometric measurements. Subjective appraisals were elicited from parents who were asked to rate their child's health as excellent, very good, good, fair, or poor. We treated this as a categorical variable but combined "fair" and "poor" due to small cell sizes. Youth in excellent health serve as the reference category in our multivariate analyses.

Parents were then asked to report whether or not a doctor or health professional ever told them that their child had a series of specific health conditions, including attention-deficit/hyperactivity disorder (ADHD); sensory limitations (such as impaired hearing or seeing); developmental disabilities (such as autism); asthma; anemia; and an array of other chronic conditions (such as epilepsy, diabetes, an orthopedic impairment, or a heart condition).

Parents also completed the Behavior Problem Index, which asked them to characterize a list of 32 problem behaviors that are "often true, sometimes true, or never true" of their child (e.g., my child is disobedient, my child lies and/or steals, my child clings to adults). These items were then used to create two continuous subscales: one measuring externalizing or aggressive behaviors and one measuring internalizing, withdrawn, or sad behaviors. We used these subscales to create two respective sets of quartiles, where the first quartile (bottom 25%) indicates low problem behaviors and the fourth quartile (top 25%) indicates high problem behaviors. Youth in the first quartiles of both scales serve as the reference categories in our multivariate analyses. For more information on the Behavior Problem Index, see Zill (1990).

Lastly, as part of the PSID-CDS, interviewers collected anthropometric measures during an in-person visit. In the first wave of the PSID-CDS, height of the child was measured by the interviewer and weight was reported by the parent. In the second and third waves, both height and weight were directly measured by the interviewer. With these measurements and growth charts based on the child's age and sex, we calculated each sample member's Body Mass Index and classified each sample member using

benchmarked thresholds for sex and age (Ogden & Flegal, 2010) as underweight, healthy weight, overweight, or obese. Youth with a healthy weight serve as the reference category in all multivariate analyses.

We show the distribution of our ten health status measures in Table 1. These distributions are weighted to generalize to the population of children in the United States age 0 to 12 years in 1997. It is worth mentioning that the percentiles of the Behavior Problem Index were calibrated on the full PSID-CDS sample and so the distributions of these measures in Table 1 are not exactly 25% for each category. Excluding psychological/behavioral problems whose prevalence are determined via the application of quartiles, the most prevalent conditions are obesity (which affects approximately one in five sample members) and asthma (which affects 14% of sample members).

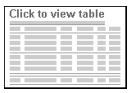

Table 1. Distribution of Key Measures from the Panel Study of Income Dynamics' Child Development Supplement (PSID-CDS) and Transition into Adulthood Supplement (PSID-TAS).

Adolescent Employment

The outcome variables in our analysis include employment status and employment intensity. Each of these outcomes are measured at three times: at age 16, at age 17, and at age 18. These time-varying, age-specific variables were constructed from questions about work that were asked to older children as part of their PSID-CDS interview, from retrospective reports on employment in the past 2 years asked of young adults in the PSID-TAS interview, and from parents who provided employment histories for each member of the household during the core biennial PSID interview.

Employment status is observed by two binary measure indicating whether or not the adolescent ever worked for pay at each age: the first measure is for employment during the school-year (September through May) and the second measure is employment during the summer months (June through August). Employment intensity is a continuous measure indicating the average number of hours worked conditional on the adolescent being employed at the focal age at any time during the year. Due to the structure of the questions asked in the PSID, we cannot parse hours worked during the school-year from hours worked during summer vacation.

Sociodemographic Characteristics

To attenuate the effects of potentially confounding factors in estimating the relationship between health and employment, we draw on an array of sociodemographic characteristics of the adolescent and their families measured during the core PSID interviews and/or in the PSID-CDS. These characteristics include the child's gender, child's race/ethnicity, child's birthweight, number of days child was born before the expected due date, mother's age and marital status at the time of the sample member's birth, mother's current marital status, father's education, mother's education, head of household's employment status, head of household's health status, family wealth from all sources, family size, and the child's score on a standardized reading assessment. Missing values of these measures were imputed using multiple imputation with chained equations (Azur et al., 2011). The distribution of these variables, which are used as inputs to our inverse probability of treatment weights (described in the next section) are shown in Table 1. These variables are not of substantive interest with respect to our specific hypotheses, and have been evaluated extensively in regards to their relationship with adolescent employment (Entwisle et al., 2000; Hirschman & Voloshin, 2007; Mortimer, 2003; Purtell & McLoyd, 2011; Schoenhals et al., 1998). For efficiency of presentation and to devote attention to our substantive hypotheses, we do not present the associated coefficients for these sociodemographic characteristics, nor do we discuss them.

Empirical Strategy

As poor health is a non-random condition, any empirical relationship observed between health and employment outcomes with observational data sources such as the PSID is potentially biased owing to confounding factors. We are able to eliminate substantial sources of confounding by using inverse probability of treatment weights (IPTWs). Based on propensity score methods developed to permit causal inference from observational data (Rosenbaum & Rubin, 1983), IPTWs are used to mimic random assignment of our treatment—which in our study is one of our ten health status measures —based on the sociodemographic characteristics described in the previous section. Applying IPTWs essentially adjusts for observed confounders by generating a weighted "pseudo-population" comparison group. This is an essential step in our analysis as youth experiencing health problems (i.e., our "treatment groups") are typically disadvantaged across an array of observable characteristics, potentially confounding differences in employment outcomes attributable to health with underlying socioeconomic causes.

One challenge to estimating the distinct effects of individual health conditions is that certain sets of conditions "cluster" to form comorbidities. We show the prevalence of such comorbidities among our health conditions in Table 2. The most common comorbiditi

involve psychological/behavioral problems. For example, 66.7% of youth in the highest externalizing problem behavior quartile are also in the highest internalizing problem behavior quartile, and 66.3% of youth with ADHD are also in the highest externalizing problem behavior quartile. Therefore, in addition to using socioeconomic characteristics as inputs to creating IPTWs for a particular health condition, we also include the rest of the health conditions as inputs to attenuate biases owing to potential co-morbidities.

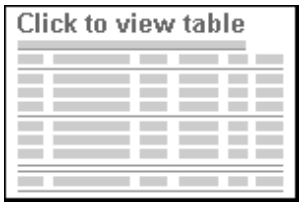

Table 2. Distribution of Comorbidities Across Health Conditions.

We begin by balancing sociodemographic and health characteristics across each of our ten health measures, assigning higher weights to comparison group members (i.e., those *without* the focal health condition) who are similar to treatment group members (i.e., those *with* the focal health condition), and lower weights to those who are dissimilar to treatment group members. We weight sample members using IPTWs estimated using generalized boosted models that utilize automated, non-parametric machine-learning techniques (McCaffrey et al., 2004). The mean and standard deviation for each health condition's IPTW are shown in Table 1.

To test our hypotheses, we estimated a series of linear regression models weighted using the resulting IPTWs for our two outcomes of interest: employment status and employment intensity. The models take the general form:

$$Y_{ia} = \alpha + \beta HEALTH_i + \tau AGE_i + \delta YEAR_a + \sum_{n=1}^{N} \beta_n X_{in} + \epsilon$$

In this model, the outcome *Y* is the expected probability that adolescent *i* is working (when the outcome is employment status) or the expected number of weekly hours worked conditional on working (when the outcome is employment intensity) at age *a*, where *a* = age 16, age 17, or age 18. On the right-hand side of the equation, the key parameters of interest are represented by *β* corresponding to *HEALTH* which includes one of our ten health measures; τ is a time-varying measure of the age of the sample member when the employment outcome is observed; and δ is a time-varying measure of the calendar year when the employment outcome is observed (i.e., "year fixed-effects"). Our analysis will include models estimated separately for each of our ten health conditions. Though there

are likely important differences by sex, race/ethnicity, and socioeconomic status, we only show estimates using our full sample of youth. Our ability to stratify models by these key sociodemographic characteristics and/or to include interaction terms between the health status measure and these sociodemographic characteristics is greatly limited by the relatively small sample size of the PSID-CDS and the low prevalence rates of our focal health conditions in the youth population. Therefore, we only present parameter estimates for the main effects of our health conditions.

As is often the case in IPTW approaches, not all weights attenuate baseline sociodemographic and health differences between the treatment and comparison groups. To deal with this, we follow the recommendation to include the sociodemographic and health characteristics used as inputs to construct the IPTWs as covariates (Bang & Robins, 2005; Huppler-Hullsiek & Louis, 2002). Therefore, in the model, β_n are the main effects of sociodemographic and health characteristics $\mathbf{X}_{in}$ (n = 1, . . ., N). With both the IPTWs and this full set of control variables, the resulting estimates β of the treatment effect *HEALTH* are considered "doubly robust."

One limitation to our analysis is that hours worked was only asked to sample members in the PSID-TAS, and so due to differences in ages when responding to the PSID-TAS survey, hours worked for some periods are sparse or missing (43% missing at age 16, 40% missing at age 17, and 48% missing at age 18). To deal with this problem, we estimate our models predicting employment intensity three ways: (1) using list-wise deletion on cases where employment intensity is unobserved; (2) using list-wise deletion on cases where employment intensity is unobserved and applying a weight that was constructed to upweight observed cases that most closely mirror the sociodemographic distribution of those who are employed; and (3) using multiple imputation with chained equations to fill in missing cases of employment intensity using the sociodemographic characteristics as predictors in the imputation model.

Findings

In Table 3 we show coefficients and standard errors from models predicting adolescent employment status. The first set of models predict employment status during the school year and the second set of models predict employment status during the summer months. Though contained in a single table, the parameter estimates displayed in Table 3 are from 20 separate models: ten health status measures × two outcomes. In Table 4 we show coefficients and standard errors from models predicting adolescent employment intensity using the three aforementioned methods for handling missing data. Though containe

single table, the parameter estimates displayed in Table 4 are from 30 separate models: 10 health status measures × one outcome × three methods for handling missing data. We discuss only those findings in Table 4 that are robust across all three missing data methods.

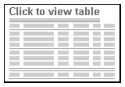

Table 3. Parameter Estimates from Linear Regression Models Predicting the Probability of Being Employed in Adolescence, Weighted with Inverse Probability of Treatment Weights (IPTWs).

Table 4. Parameter Estimates from Linear Regression Models Weighted with IPTWs Predicting Employment Intensity with Different Strategies for Handling Missing Data on the Dependent Variable.

We first examine the relationship between parents' subjective appraisal of their child's health and the child's employment outcomes when they enter adolescence. In Table 3, we see that overall health is unrelated with the probability of employment during the school year or during the summer months. Further, in Table 4, across the three different models predicting employment intensity, none of the parameter estimates for overall health status reaches statistical significance. While *overall* health does not appear to be a direct determinant of employment, there may be specific *conditions* that accelerate or impede the transition to work during adolescence. To assess whether this is the case, we turn our attention to models that include the different conditions and discuss their implications for each of our hypotheses in turn.

Our first hypothesis (H_1) is that youth with autonomy limiting conditions will be less connected to the labor force during adolescence than their peers without these conditions. We find partial support for this hypothesis. During both the school year and summer months, youth with sensory limitations have a .08 lower probability of being employed than their peers without sensory limitations. During the school year, youth with developmental disabilities have a .09 lower probability of being employed than their peers without developmental disabilities, but work at comparable rates during the summer months. In Table 4, we see that none of the coefficients for autonomy limiting conditions reach statistical significance—indicating that once employed, those with sensory limitations and developmental disabilities work the same number of hours a week as their peers.

Next, we evaluate our second hypothesis (H_2), which states that obese youth will be less connected to the labor force during adolescence than their peers. None of the coefficients associated with different categories of Body Mass Index are significant in our models predicting employment status (Table 3) or employment intensity (Table 4). Thus, while body weight has been shown to affect labor market outcomes for adults, it is does not appear to operate the same way for adolescents. Obese youth are as likely to hold a job and to work about the same number of hours as their healthy weight peers.

Our third hypothesis (H_3) was exploratory because there is reason to believe that youth with psychological/behavioral problems may have stronger attachments to the labor force (because they are disengaged from school and seeking human capital acquisition outside the classroom) or alternatively, weaker attachments to the labor force (because they might exhibit difficult attributes that would potentially discourage employers from hiring them and impede their ability to perform on the job should they get hired). To adjudicate between these two possibilities, we focus on three conditions: externalizing problem behaviors, internalizing problem behaviors, and ADHD.

Interestingly, we find partial support for *both* hypotheses (H_{3A} and H_{3B}). With respect to employment status, we see that adolescents who exhibit externalizing problem behaviors are less likely to work, but only during the summer months. Youth with internalizing problem behaviors or youth with ADHD are as likely to work during adolescence as their peers without those conditions. However, with respect to employment intensity, we see that some psychological/behavioral problems are associated with an elevated attachment to the labor force. While those who exhibit the highest degree of externalizing problem behaviors are less likely to work, when they do work they spend on average 4 to 5 hours a week *more* at their jobs than their peers who exhibit the lowest degree of externalizing problem behaviors. Additionally, while youth with ADHD are as likely to work as their peers without ADHD, when they do work they spend on average 2 to 3 hours a week *more* at their jobs than their peers without ADHD.

Lastly, we test our fourth hypothesis (H_4) that chronic conditions such as asthma and anemia will be the least consequential health conditions for employment outcomes. We find partial support for this hypothesis. None of the coefficients associated with asthma or anemia—the most prevalent chronic conditions among youth in our sample—are significant in our models predicting employment status (Table 3) or employment intensity (Table 4). However, our residual category of “other chronic conditions” which combines an array of disparate conditions (such as epilepsy, diabetes, orthopedic impairments, heart conditions, etc.) with prevalence rates too low to estimate individually, yields a statist

significant negative coefficient in all models predicting employment intensity. Youth with other chronic conditions are as likely to work as their peers without them. However, when they do work, they spend on average 3 hours less per week at their jobs than their peers.

Conclusion

As youth enter adolescence, they begin to take on new roles and responsibilities that position them for the transition to adulthood. One such role is that of "worker/employee." Holding a job while in adolescence, particularly when it is in moderation and not substantially interfering with school work, has been shown to be a critical experience that prepares youth for the challenges of the adult work place (Mortimer, 2003). Because of the potential value of these experiences, researchers have sought to determine both selection into and the consequences of employment during the adolescent years. Our study contributes to the former, by focusing on poor health as a potential impediment to these experiences.

In our study, we find that poor health as measured by an overall subjective health appraisal does *not* preclude participation in the labor force during the adolescent years nor does it limit the number of hours spent working. However, we find that certain conditions—namely sensory limitations, developmental disabilities, and externalizing problem behaviors—may impede attachments to the labor force during adolescence. Our analysis provides evidence that all three of these conditions are associated with a lower probability of employment during the school year or during the summer. While we lack the data to test specific mechanisms under girding these observed relationships, we speculate that sensory limitations and developmental disabilities limit the autonomy of youth in ways that make it difficult for them to handle the tasks and stressors involved in holding a part-time job—particularly while also trying to fulfill academic obligations during the school year. Youth with externalizing problem behaviors might exhibit attributes such as being inattentive, fidgety, aggressive, lacking deference to authority, and/or confrontational—that would potentially discourage them from seeking employment or discourage employers from hiring them. Future research with data that has more in-depth measures of the job search and hiring process will be needed to discern which mechanisms are most salient here.

While on average we find that health conditions do not preclude employment, we do observe that those with externalizing problem behaviors and ADHD work *more* hours a week than those without such problem behaviors. As we mentioned at the outset of the paper, a consistent finding in past research is that youth who are disengaged from school

often invest their energies into paid work as a means to acquire relevant human capital outside the classroom (Mortimer, 2003; Schoenhals et al., 1998; Staff et al., 2010). Disengagement is often a symptom of broader psychological/behavioral problems, and so it is not surprising to see that these problem behaviors are empirically linked with employment intensity in the PSID data. Some research suggests that adolescent employment, particularly when it is stressful, can contribute to mental health conditions like depression (Mortimer et al., 2002). If youth who work at high levels of intensity already exhibit some externalizing problem behaviors and ADHD before taking on a job, experiences in the workforce could potentially exacerbate these behaviors. Together, our findings point to mental health as a potential liability to youth during the school-to-work transition.

Given variation in how health conditions affect youth, we predicted that chronic conditions would have the least effect on employment outcomes because for many youth, they are treatable and/or manageable, particularly when under the care of medical practitioners. As expected, the two most prevalent chronic conditions in youth—asthma and anemia—were found to have no relationship with either employment status or with employment intensity. However, we did see evidence that youth with “other chronic conditions,” which includes an amalgam of conditions such as epilepsy, diabetes, orthopedic impairments, and heart problems, had lower levels of employment intensity. Future research with larger sample sizes will be needed to identify specifically which of these conditions are most limiting with respect to employment during adolescence.

Our study has many strengths, including prospectively measured health conditions in a longitudinal cohort followed throughout childhood and adolescence, a rich array of sociodemographic controls including measures of parent’s health and children’s health at birth, and the application of inverse probability of treatment weights to attenuate the threat of selection bias. A limitation, however, is that our measures of health conditions are based on parent reports of diagnosed health conditions. In particular, the measures rely on access to and use of health care facilities for children with a health problem, the accurate diagnosis of a problem, and a parent’s accurate report of the diagnosis in the survey interview. Reported conditions are thus contingent on access to medical care and on a provider accurately communicating the condition to the parent. Parents may forget heath conditions their child experienced, especially if these occurred in the more distant past. It could be that some health problems among low-income sample members are underreported due to limited access to health care and, in turn, bias our results. With the data currently available, we are unable to assess how extensive such underreporting is in CDS.

An additional limitation is that the health measures in CDS do not capture differences in the severity of health conditions or information about treatment that might mitigate the consequences of a health condition. For example, sensory limitations can include those who are legally blind as well as those with minor vision problems which are corrected by lenses; obesity can include those with substantial excess body fat as well as those who have muscular athletic builds; and some children with asthma have their symptoms under control using medication while others regularly experience negative effects of the condition. Moreover, though we measure health conditions in the years immediately preceding the modal legal age for holding a paid job, some health conditions may have attenuated (i.e., an obese 12 year-old who is of healthy weight by age 16). With the data at hand, we do not know the severity of these conditions, their duration, nor the extent to which they are being treated and under the care of medical practitioners.

In closing, our study contributes to the growing body of research on the relationship between health and human capital acquisition across the life course. A broad base of research shows that poor health in childhood has a number of adverse consequences, including lower eventual levels of socioeconomic attainment and increased health risks in adulthood. We contribute to this research base by demonstrating that certain health conditions experienced during youth, especially those that limit one's autonomy, may stunt the transition to work. Additionally, we find that youth with externalizing problem behaviors and ADHD may spend an increasing amount of time at their jobs, which may serve to curtail healthy development in the short-term. These divergent findings—that is, some conditions *impeding* attachments to the labor force attachments while other conditions *accelerating* attachments to the labor force—underscore the complex ways in which health and human capital acquisition intersect early in the life course. In our analysis we focused on employment status and employment intensity as outcomes, but other dimensions of the adolescent employment experience may be affected by health, including the timing and type of first job, industry, wages, and quality of the work. Given the dearth of research on the relationship between health and employment in adolescence, further investigation into these links with additional outcomes will help advance our understanding of healthy development in the context of early labor force experiences.

Acknowledgements

The authors gratefully acknowledge programming assistance from Meichu Chen and Christine Peterson.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by a generous grant from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Institutes of Health (P01 HD087155).

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