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# Impact of Early Work Experiences on Subsequent Paid Employment for Young Adults With Disabilities

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## Abstract

To better understand how early work experience shapes subsequent employment outcomes for young people (ages 18 to 20) with disabilities, we analyzed longitudinal data from the Youth Transition Demonstration (YTD) evaluation to test whether the employment experiences of 1,053 youth during the initial year after entry affected their employment during the third year after entry. To derive causal estimates, we used a dynamic-panel estimation model to account for time-invariant unobserved individual characteristics that may be correlated with youth's self-selection into both early and later employment. We also controlled for other socioeconomic and health factors that may affect later employment. We found that early work experience increases the probability of being employed 2 years later by 17 percentage points. This estimate is an important advancement over the correlational approaches that characterize the current literature and provides stronger evidence that early work experience is a key determinant of subsequent labor market success.

## Keywords

transition, vocational, career development, postschool outcomes

Equipping young people with disabilities to enter the world of work is an enduring emphasis of research and practice in the field of special education and transition (D'Alonzo, 1978; Halpern, 1985; Madaus et al., 2013). Recognition of the substantive contributions that a good job can make to an individual's quality of life, community connections, and self-worth has led to the emergence of several prominent themes in national policy and legislative initiatives—promoting (a) economic self-sufficiency and (b) strong college and career pathways for young people with disabilities. Indeed, the Individuals With Disabilities Education Improvement Act of 2004 describes the overarching purpose of special education as preparing students with disabilities "for further education, *employment*, and independent living" (emphasis added). Moreover, the extent to which these students obtain jobs in the early years after graduation has become a primary metric for gauging the effectiveness of special education and transition services (i.e., Indicator 14).

Despite decades of dialog about the importance of improving postschool outcomes, however, this commitment has yet to be reflected in the actual employment outcomes of young adults with disabilities. Unemployment and underemployment continue to characterize the postschool landscape for many graduates with disabilities. For example, analyses of the American Community Survey indicate that only 23% of young people with disabilities ages 16 to 21 and 41% of adults with disabilities ages 22 to 30 were employed in 2013 (Butterworth & Migliore, 2015). Disappointing employment outcomes characterize almost every disability category in the first 8 years after the youth leave high school (Newman et al., 2011). Without intervention, large numbers of young people with disabilities miss out on meaningful opportunities to contribute to and benefit from involvement in the workforce (e.g., Bouck, 2012; Bouck & Joshi, 2014; Carter, Austin, & Trainor, 2012; Shattuck et al., 2012). Moreover, this postschool portrait has not changed substantively over the last 25 years of federally mandated transition services (Butterworth et al., 2014; Newman, Wagner, Cameto, Knokey, & Shaver, 2010).

The elusiveness of early employment experiences for young people with disabilities has directed much attention toward understanding factors that contribute to better vocational outcomes (e.g., Cmar, 2015; Doren, Gau, &

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Lindstrom, 2012; McConnell et al., 2013; Sima, Wehman, Chan, West, & Leucking, 2015; Simonsen & Neubert, 2013). Although myriad individual, family, and community factors (e.g., parental expectations, social skills, student demographics, and geographic locale) can shape adult outcomes for youth, paid work experience during adolescence is consistently identified as a prominent predictor of better postschool outcomes (e.g., Benz, Lindstrom, & Yovanoff, 2000; Benz, Yovanoff, & Doren, 1997; Joshi, Bouck, & Maeda, 2012; Papay & Bambara, 2014; Wagner, Newman, & Javitz, 2014; Wehman et al., 2015). For example, Carter et al. (2012) found that adolescents with severe disabilities who held a school-sponsored, after-school, or summer job were more than twice as likely as students who lacked these experiences to connect to a paid job after high school. Due to the frequency of this finding, the promotion of early work experiences has become a core component of most prevailing transition frameworks, including the youth program under the Workforce Innovation and Opportunity Act of 2014 (Certo et al., 2008; Employment and Training Administration, 2014; Kohler & Field, 2003; National Alliance for Secondary Education and Transition, 2005; National Collaborative on Workforce and Disability for Youth, 2009).

Although the utility of early work experiences is now widely accepted, it is important to emphasize that available research undergirding interventions to provide youth with early work experiences is *correlational* rather than *causal.* Two key limitations accompany this reliance on correlational studies. First, the nature of such evidence leaves open the possibility that other factors are influencing the association between work experiences across time, such as personal motivation, disability-related needs, career-related skills, and other individual characteristics. For example, it may be that adolescents who work during high school have stronger parental support for engaging with their communities and that such support translates to greater postschool employment. Second, findings from correlational studies are of limited use in estimating the likely impacts of transition-related interventions aimed at connecting youth to early work experiences. New analytic approaches are needed to support stronger claims about the true impact of early work experiences. Such evidence could increase confidence in the prevailing policy and practice recommendations that affirm the value of paid work during adolescence.

The purpose of our study is to examine how early work experience shapes subsequent employment outcomes of youth with disabilities. For our analysis, we drew upon longitudinal data from the evaluation of the Social Security Administration's (SSA) Youth Transition Demonstration (YTD) projects (Fraker et al., 2016; Rangarajan et al., 2009) and focused on youth with disabilities ages 18 to 20 who were receiving Supplemental Security Income (SSI) payments when they enrolled in the evaluation. In this study, we tested whether youths' employment experience during the initial year after enrollment in the evaluation affected their employment experience 3 years after entry. To derive causal estimates, we used a dynamic-panel estimation model (Anderson & Hsiao, 1982; Wooldridge, 2010) to account for fixed (i.e., time-invariant) unobserved characteristics of the youth that may be correlated with their self-selection into both early and later employment. We also controlled for observed baseline socioeconomic and health factors that may affect subsequent employment.

## Method

### *The YTD Evaluation*

Data for the current analysis were collected as part of a rigorous evaluation of the YTD projects completed by Mathematica Policy Research and its partners. Recognizing the importance of equipping young people with disabilities to achieve their full economic potential, SSA developed the YTD initiative in 2003 (Fraker & Rangarajan, 2009). Focusing on youth ages 14 to 25 who were either receiving SSI or Social Security Disability Insurance (DI) benefits or were at high risk of receiving them in the future, SSA invested considerable resources in developing, implementing, and evaluating promising strategies to help youth with disabilities become as self-sufficient as possible. The six YTD projects that were included in the national evaluation operated in the following locations: four counties in Colorado, Miami-Dade County in Florida, Montgomery County in Maryland, Bronx County and Erie County in New York, and 19 counties in West Virginia. The YTD projects offered services designed to lift the barriers facing these youth as they transitioned to adulthood. The YTD initiative also included SSA waivers of disability program rules to allow young workers to keep more of their benefits as their earnings increased.

The YTD evaluation included an impact analysis based on a randomized controlled trial (see Rangarajan et al., 2009). Youth with disabilities who agreed to be in the study were randomly assigned to either a treatment or control group. The treatment group members were eligible for both the waivers and YTD services, whereas the control group members followed standard SSA program rules and could access only the non-YTD services available in their communities.

In the current analysis, we relied on the longitudinal data collected on YTD evaluation enrollees through three surveys and from SSA administrative records. The evaluation team conducted the data collection when the youth entered the evaluation and before YTD services were delivered to them, as well as 1 and 3 years after entry. Because enrollment across the six YTD study projects occurred on a rolling basis, each round of data collection spanned several

**Table 1.** Sample Size by YTD Project Site and Age.

| Project site | Age of participants | | | Total | % of sample |
|---|---|---|---|---|---|
| | 18 years | 19 years | 20 years | | |
| Bronx County, NY | 37 | 0 | 0 | 37 | 3.5 |
| Colorado | 55 | 75 | 79 | 209 | 19.8 |
| Erie County, NY | 69 | 79 | 75 | 223 | 21.2 |
| Miami-Dade County, NY | 115 | 122 | 100 | 337 | 32.0 |
| Montgomery County, MD | 28 | 11 | 11 | 50 | 4.7 |
| West Virginia | 67 | 67 | 64 | 198 | 18.8 |
| Total | 371 | 354 | 329 | 1,054 | 100 |

*Note.* YTD = Youth Transition Demonstration; NY = New York; MD = Maryland.

years—data collection at entry was conducted between July 2006 and December 2010; the 1-year follow-up data collection, between December 2007 and March 2012; and the 3-year follow-up data collection, between September 2009 and April 2014. Our data collection captured information on service receipt, educational attainment, employment and earnings, and other measures. The administrative data included monthly amounts of SSI and DI benefits from SSA. Fraker, Mamun, Honeycutt, Thompkins, and Valentine (2014) and Fraker et al. (2016) presented comprehensive findings on the 1-year and 3-year impacts of the YTD projects. In this article, our purpose is *not* to estimate the impacts of the YTD projects but rather to investigate in an innovative way the causal relationship between early work experience and subsequent paid employment.

## *Study Sample*

The full sample for the YTD evaluation included more than 5,000 youth with disabilities ages 14 to 25 who were (a) SSI and/or DI beneficiaries or (b) at risk of becoming beneficiaries. In our study, we included only the subset of youth who were (a) receiving SSI and (b) ages 18 to 20 when they enrolled in the evaluation. We adopted this focus because youth with disabilities ages 18 to 20 would be eligible to be employed in a competitive job within the follow-up period for which we have data. Although younger youth may be exposed to work, it is less likely that many of them would have pursued competitive employment within our 3-year window for analysis. Restricting the sample to this age range also allowed us to compare our findings with other studies in the literature focused on high school–age students (e.g., Carter et al., 2012).

Of the 5,033 enrollees in the YTD evaluation, 1,054 (21%) met the age and SSI participation restrictions we applied for this analysis. Table 1 presents the distribution of the sample youth across the six YTD sites. The YTD project in the Bronx primarily targeted youth who were younger than age 18, whereas the project in Montgomery County did not specifically target SSI recipients. These targeting decisions explain why these two YTD evaluation sites contributed relatively few youth to the sample for the current study.

Consistent with SSI recipients nationally, the majority (62.0%) of youth in the study sample were male. Their average age at entry into the evaluation was 19.0 years, and 40.0% were enrolled in high school at this time. In terms of race/ethnicity, 58.4% were White, 29.2% were Black, 2.1% were American Indian/Alaskan, 0.8% were Asian, and 0.3% were Hawaiian/Pacific Islander; 9.2% had Other racial/ethnic backgrounds. Disabilities were reported based on the primary disabling conditions reflected in SSA records: 42.6% had a cognitive or developmental disability, 15.9% had a mental illness, 15.8% had a physical disability, 12.8% had a learning disability or an attention deficit disorder, and 6.3% had a sensory impairment (e.g., speech, hearing, or visual); information was missing for 6.6% of the sample. In terms of socioeconomic markers, 25.9% of family incomes were less than US$10,000, 30.4% were US$10,000 to 25,000, and 34.5% were greater than US$25,000; 9.2% of the sample did not report this information. Also, 25.6% of mothers and 22.5% of fathers had not graduated from high school, 44.5% of mothers and 33.4% of fathers had graduated from high school, and 24.6% of mothers and 23.2% of fathers had graduated from a 2- or 4-year college; 5.3% of mothers and 21.0% of fathers did not provide answers.

Data collected in the first year after entry (i.e., the 1-year survey) indicated that 51.6% of youth were enrolled in school (including secondary and postsecondary schools); moreover, 43.2% expected to continue their education. When asked about their health, 17.8% of youth described it as excellent, 56.2% as very good or good, and 25.1% as fair or poor; 0.9% did not answer. During the year following enrollment, 36.8% of families received benefits from the Special Nutrition Assistance Program (SNAP), 5.0% received Temporary Assistance for Needy Families (TANF) benefits, and 89.3% had health insurance coverage. The average SSA benefit amount received by youth over the course of the year was US$6,241. Because these data were

drawn from a randomized controlled trial, 55.4% of the youth in the study sample (those who had been assigned to the treatment group) had access to YTD services in the initial postenrollment year.

Two features of the study sample should be considered in interpreting the findings from this analysis. First, the sample members were receiving SSI at entry into the project, which means that they had been determined to have significant disabilities and that their family incomes were low. Second, the sample members had voluntarily applied to be in the YTD evaluation, which means they agreed to be in a study in which they could be randomly selected to be eligible for employment-focused services and waivers. This suggests that youth in this study were likely to be receptive to the opportunity for paid employment. Indeed, 70.9% of the respondents to the 1-year survey reported that they expected to work at least part-time in the future.

## Measures

*Employment outcomes.* In each of the three waves of the YTD evaluation surveys (at enrollment, after 1 year, and after 3 years), youth were asked whether they had been employed in a paid job at any time during the preceding year. Paid employment status during the third year after entry ($E_{i,3}$)—obtained from the 3-year survey—is the key dependent variable of interest in the study. Paid employment status during the first year after entry ($E_{i,1}$)—obtained from the 1-year survey—is the key explanatory variable. Paid employment status during the year preceding the survey completed at entry ($E_{i,0}$) is an instrumental variable in the fixed-effects analysis (discussed below).

*Control variables.* We included demographic, health, and family background characteristics of the youth as control variables in a regression analysis of paid employment during the third year to capture potential confounders correlated with both prior and current employment outcomes. In Equation 1, these are denoted by $\mathbf{X}_{i,3}$. We controlled for a youth's gender, race, age, and primary disabling condition. In addition, we included indicators of parental educational attainment, household income, and the YTD project site as control variables. Almost all multinomial categorical variables used as control variables in the analysis (except the race indicator) have a category for missing values to preserve the sample and to capture unobserved differences across youth. We used all these characteristics as measured at enrollment in the evaluation, and thus they are fixed over time. Statistics on all of these measures were reported in the "Study Sample" section.

We also included in the analysis additional control variables that may vary over time, such as the youth's contemporaneous health status and whether the youth had contemporaneous access to YTD services. To capture local macroeconomic conditions that may affect youth employment, we included annual state unemployment rates and YTD site-specific linear time trends as controls. To further account for temporal effects on employment, we included indicators of calendar year as controls.

Finally, for characteristics that might have been influenced by previous employment experience but that likely affect subsequent work status, we included variables with one period lags (rather than contemporaneous values). In particular, control variables include lagged indicators of whether anyone in the youth's household received support from SNAP, TANF, or SSA disability programs; the lagged inflation-adjusted amount of SSA benefits received (expressed in December 2008 dollars); a lagged indicator for whether the youth had health insurance; a lagged indicator for whether the youth was enrolled in school; and lagged indicators of the youth's expectations regarding future education and employment.

## Data Analysis

The main relationship of interest in our analysis is the extent to which early employment experience affects subsequent employment outcomes for youth with disabilities. That relationship can be expressed using a regression equation of the following form:

$$E_{i,3} = \theta E_{i,1} + \beta \mathrm{X}_{i,3} + \upsilon_{i,3}, \quad (1)$$

where $E_{i,3}$ is the paid employment indicator for individual youth *i* during the third year after enrollment in the evaluation and $E_{i,1}$ is an employment indicator for the same youth during the first year after entry. The regression model also includes the vector $\mathbf{X}_{i,3}$, which symbolizes other observed factors affecting employment at 3 years, and $\upsilon_{i,3}$, which is an error term. We discussed the variables included in $\mathbf{X}_{i,3}$ in the previous section on measures. The key coefficient of interest in the regression model is $\theta$, which represents the effect of employment during the first year after entry on employment during the third year after entry. In other words, $\theta$ measures the extent to which early work experience plays a role in subsequent paid employment.

*Naïve estimation.* Because youth may self-select themselves into employment (or not), it is likely that systematic underlying differences exist between the sample youth who engaged in work-based experiences during the first year after enrollment in the YTD evaluation and those who did not. These differences might be reflected in characteristics that can be readily captured in surveys (e.g., the nature of a youth's disability and parental education), as well as

characteristics that are difficult or impossible to measure in this way (e.g., a youth's motivation and ability to adapt to the world of work). Because these characteristics may influence employment status in both time periods in the regression model ($t = 1$ and 3), failure to account for them in the regression analysis would be tantamount to omitting relevant control variables from the model. Consequently, this would result in a biased estimate of $\theta$. More specifically, if there are unobserved differences across the sample youth that are correlated with both earlier employment and subsequent employment, then naïvely estimating Equation 1 using the ordinary least squares (OLS) regression method would produce a biased estimate of the causal effect of earlier work experience on subsequent paid employment (see Note 1).

*Fixed-effects estimation.* To obtain an unbiased estimate of $\theta$, we employed a fixed-effects estimation approach, which allowed us to account for all youth characteristics that are fixed over time regardless of whether they were measured in the YTD surveys. The fixed-effects estimation approach employs the differencing of youth characteristics and outcomes across time, which enabled us to control for both observed and unobserved youth characteristics that do not vary over time. In other words, the control variables that are fixed over time drop out of the fixed-effects estimation of Equation 1 due to differencing; however, they do not drop out of the naïve estimation. This approach provides an unbiased estimate of $\theta$ under the assumption that there are no time-varying youth characteristics that are correlated with employment status at different points in time. Because we estimated a regression model in which the key explanatory variable of interest $E_{i,1}$ (employment status during the first year after entry) is a lagged value of the same measure as the dependent variable $E_{i,3}$ (employment status during the third year after entry), we used a modified fixed-effects estimation approach suggested by Anderson and Hsiao (1982), in which employment status at the time of entry into the YTD evaluation, $E_{i,0}$, is an instrumental variable in the estimation process (see Note 2).

We present results for both the naïve estimation of Equation 1 and the fixed-effects estimation. The difference in the estimated value of $\theta$ between these two approaches sheds light on the extent to which the naïve estimate is biased; therefore, it does not accurately represent the causal effect of early employment experience on subsequent paid employment. For both estimation approaches, we used a linear probability model, even though the dependent variable is dichotomous. Although probit or logit models are often used when the dependent variables are dichotomous, we preferred the linear probability model for this study because it provides a convenient approximation of outcome probability at average values of the control variables, relies on weaker parametric assumptions, and is easier to interpret. In practice, the probit or logit and linear probability models generally yield similar results for the types of effects that we estimated here (Angrist & Pischke, 2008; Wooldridge, 2010). All the estimated standard errors in our analysis are robust to heteroscedasticity and adjusted for clustering of the sample by YTD project location.

## Results

### *Employment Outcomes*

We found that 36.9% of the youth in the study sample were employed in paid jobs at some time during the third year after entry into the YTD evaluation. However, there were large differences in third-year employment between youth who had been employed 1 year after entry (65.2%) and youth who had not been employed during that prior year (23.0%). Overall, 33.0% of all youth had worked for pay during the first year after entry. These descriptive employment patterns suggest that prior work experience may play an important role in shaping subsequent employment outcomes. They also suggest that youth who had engaged in paid employment in the earlier period may be a select group that acts systematically differently than the group that had not engaged in paid employment in that period. Therefore, we designed our fixed-effects regression analysis to rigorously estimate the former relationship while controlling for the self-selection of youth into earlier employment.

### *Findings From the Naïve Regression Analysis*

The results from the naïve regression analysis of Equation 1, specifically the estimate of $\theta$, suggest that paid employment during the first year after entry into the YTD evaluation increased the likelihood of youth's paid employment during the third year by 36 percentage points. (The naïve estimate of $\theta$ is in Table 2; the naïve estimates of all the coefficients in Equation 1 are in Table 3.) As we noted previously, even though this estimate is derived while accounting for a number of observed characteristics of youth, their family backgrounds, state unemployment rates, and time trends, the estimate is likely to be biased because the analysis does not account for time-invariant unobserved characteristics that may influence employment status during both the first and third years after entry. Indeed, when we compare the results from the naïve regression analysis with those from the fixed-effects analysis, it is evident that the naïve regression estimate substantially overstates the influence of earlier work experience on subsequent paid employment among youth with disabilities.

**Table 2.** Effect of Early Work Experiences on Later Paid Employment Status: Linear Regression Coefficients.

| Sample group and analytic approach | Coefficient | *SE* |
|---|---|---|
| All YTD sites combined | | |
| Naïve regression | 0.358*** | (0.0340) |
| Fixed-effects regression | 0.171** | (0.0778) |
| By YTD site (fixed-effects regression)[a] | | |
| Bronx County, NY | 0.647*** | (0.0463) |
| Colorado | 0.342*** | (0.0323) |
| Erie County, NY | 0.361*** | (0.0158) |
| Miami-Dade County, NY | 0.031*** | (0.0054) |
| Montgomery County, MD | 0.123*** | (0.0099) |
| West Virginia | 0.009 | (0.0147) |

*Note.* Entries in the table represent the estimated coefficients from linear regressions. As linear probability models were used, the estimated effects can be interpreted as percentage point changes (once multiplied by 100). The control variables included in both the naïve and fixed-effects regression model are age at baseline, gender, race, family income, parental education, disability type, health status, YTD treatment indicator, YTD site, year, site-specific time trends, annual state unemployment rate, lagged SNAP receipt status, lagged TANF receipt status, lagged SSA benefit indicators, lagged SSA benefit amount, lagged health insurance status, lagged indicator for in-school status, lagged expectations about education, and lagged expectations about employment. The fixed-effects regression model also accounts for other unobserved factors that are fixed over time. Standard errors, shown in parentheses, are heteroscedasticity robust and adjusted for clustering by YTD site. SE = Standard Error; YTD = Youth Transition Demonstration; SNAP = Special Nutrition Assistance Program; TANF = Temporary Assistance for Needy Families; SSA = Social Security Administration; NY = New York; MD = Maryland.
[a]Coefficients capturing YTD site-specific effects are estimates from fixed-effects regression that accounts for time-invariant unobserved characteristics.
Estimated coefficient is statistically different from zero: *$p < .10$. **$p < .05$. ***$p < .01$.

### *Findings From the Fixed-Effects Regression Analysis*

The estimate of $\theta$ from the fixed-effects regression analysis shows that, even after accounting for time-invariant unobserved characteristics, early work experience had a sizable effect on the subsequent employment of youth SSI recipients. Specifically, paid employment during the first year after entry into the YTD evaluation increased the likelihood of being employed during the third year by 17 percentage points (see Tables 2 and 3). Even though the more rigorous analysis yields an estimate of the effect of early work experience on later paid employment that is only half as large as the naïve estimate, the estimated effect is still substantial. This finding provides strong evidence that early work experience is a key determinant of subsequent labor market success.

Fixed-effects regression analysis of Equation 1 by YTD project site yields estimates of $\theta$ that are positive and statistically significant for five of the six YTD evaluation sites (see Table 2). In those sites, the estimated effect of employment during the first year after entry on the likelihood of being employed in the third year ranges from 3 percentage points in Miami-Dade County, Florida, to 65 percentage points in Bronx County, New York. In the West Virginia site, the estimate of $\theta$, while positive, is not significantly different from zero. The variation across sites may reflect differences in local labor market conditions not captured by our control variables as well as differences in employment barriers facing youth with disabilities.

**Table 3.** Effect of Early Work Experience on Later Paid Employment Status (Year 3): Linear Regression Coefficients for All Covariates.

| | Naïve regression | | Fixed-effects regression | |
|---|---|---|---|---|
| Variable | Coefficient | *SE* | Coefficient | *SE* |
| Paid employment status at 1 year | 0.358*** | (0.0340) | 0.171** | (0.0778) |
| Age (at entry, in years) | −0.034 | (0.0277) | — | — |
| Female | −0.058* | (0.0268) | — | — |
| Race | | | | |
| American Indian/Alaskan | 0.019 | (0.1268) | — | — |
| Asian | 0.271 | (0.1446) | — | — |
| Black | 0.040 | (0.0198) | — | — |
| Hawaiian/Pacific Islander | −0.034 | (0.0766) | — | — |
| Other | 0.041 | (0.0621) | — | — |
| Site | | | | |
| Bronx County, NY | −1.362*** | (0.2877) | — | — |
| Erie County, NY | 0.243 | (0.2129) | — | — |
| Miami-Dade County, FL | —[a] | — | — | — |
| Montgomery County, MD | 7.892** | (2.0439) | — | — |
| West Virginia | 6.453*** | (1.5713) | — | — |
| Family income (at entry) | | | | |
| 10,000–<25,000 | 0.082*** | (0.0186) | — | — |

*(continued)*

**Table 3.** (continued)

| Variable | Naïve regression | | Fixed-effects regression | |
|---|---|---|---|---|
| | Coefficient | *SE* | Coefficient | *SE* |
| ≥25,000 | 0.061 | (0.0378) | — | — |
| Missing | 0.12** | (0.032) | — | — |
| Mother's education (at entry) | | | | |
| Graduated from high school | −0.058 | (0.0342) | — | — |
| Not a high school graduate | −0.083 | (0.0505) | — | — |
| Missing | −0.146*** | (0.0264) | — | — |
| Father's education (at entry) | | | | |
| Graduated from high school | −0.034 | (0.0327) | — | — |
| Not a high school graduate | −0.023 | (0.0608) | — | — |
| Missing | −0.063 | (0.0463) | — | — |
| Disability (at entry) | | | | |
| Cognitive/developmental | −0.001 | (0.0626) | — | — |
| Learning disability/ADD | 0.037 | (0.0442) | — | — |
| Physical illness | −0.059 | (0.0677) | — | — |
| Speech, hearing, visual impairment | −0.011 | (0.0752) | — | — |
| Missing | 0.02 | (0.0874) | — | — |
| Health status (at 1 year) | | | | |
| Very good or good | −0.052 | (0.0367) | −0.079*** | (0.0273) |
| Fair or poor | −0.089* | (0.041) | −0.079** | (0.0338) |
| Missing | 0.069 | (0.0814) | 0.129* | (0.0754) |
| In YTD treatment group | −0.011 | (0.0251) | 0.073 | (0.0505) |
| State unemployment rate (at 3 years) | 0.889** | (0.2258) | 0.021 | (0.0216) |
| SNAP (at 1 year) | 0.026 | (0.0402) | 0.042** | (0.0194) |
| TANF (at 1 year) | 0.008 | (0.0542) | 0.035 | (0.0294) |
| SSA benefits (at 1 year) | −0.026 | (0.0488) | 0.031 | (0.091) |
| Health insurance (at 1 year) | −0.117* | (0.0493) | −0.051 | (0.051) |
| Enrolled in school (at 1 year) | 0.03 | (0.0399) | 0.056* | (0.0317) |
| Expects to continue education (at 1 year) | 0.008 | (0.0167) | −0.039 | (0.0267) |
| Expects to work at least part-time for pay (at 1 year) | 0.151** | (0.0453) | −0.09 | (0.058) |
| SSA benefit amount (at 1 year, in thousands) | −0.012* | (0.0055) | −0.013 | (0.0109) |

*Note.* Entries in the table represent the estimated coefficients from linear regressions. As linear probability models were used, the estimated effects can be interpreted as percentage point changes (once multiplied by 100). The control variables included in both the naïve and fixed-effects regression model are age at entry, gender, race, family income, parental education, disability type, health status, YTD treatment indicator, YTD site, year, site-specific time trends, annual state unemployment rate, lagged SNAP receipt status, lagged TANF receipt status, lagged SSA benefit indicators, lagged SSA benefit amount, lagged health insurance status, lagged indicator for in-school status, lagged expectations about education, and lagged expectations about employment. The fixed-effects regression model also accounts for other unobserved factors that are fixed over time. Standard errors, shown in parentheses, are heteroscedasticity robust and adjusted for clustering by YTD site. SE = Standard Error; YTD = Youth Transition Demonstration; SNAP = Special Nutrition Assistance Program; TANF = Temporary Assistance for Needy Families; SSA = Social Security Administration; ADD = attention deficit disorder; NY = New York; MD = Maryland; FL = Florida.

[a]The indicator for the Miami-Dade County site drops out of the estimated equation because it's correlated with the site-specific time trend.

Estimated coefficient is statistically different from zero: *$p < .10$. **$p < .05$. ***$p < .01$.

## Discussion

Improving the postschool employment outcomes of young adults with disabilities has been an enduring emphasis of research, policy, and practice in the field of transition. Although early work experience has been repeatedly identified as a promising pathway to meaningful work in adulthood, the evidence for this practice recommendation has been largely correlational. The current analysis extends this literature by addressing the risk of overestimating the effect of early work experience on subsequent paid employment for youth with disabilities. Although our findings yield a statistically significant and important positive estimate of that effect, the evidence is more rigorous and provides greater confidence that a causal relationship exists between early exposure to work for youth with disabilities and their future trajectories of employment. Moreover, our analysis shows that failure to account for the fixed individual characteristics—which may drive the self-selection of youth into both early and later employment—can result in overestimation of the effect of early work experience on later employment. The challenge in accounting for those fixed characteristics is that some of them may be difficult or impossible to observe.

The estimate of the effect of early work experience on the likelihood of later employment from our naïve analysis

(i.e., neglecting the influence of unobserved fixed characteristics) is 36 percentage points, which is similar in magnitude to estimates available in the recent literature (cf. Carter et al., 2012). However, once we account for all time-invariant individual characteristics, including those for which no measures are available in our dataset, the estimated effect is about 17 percentage points, which is still substantial but notably smaller than the naïve estimate. Thus, the existing literature needs to be considered with caution because it likely overstates the causal effect of early work experience on later employment. It is reassuring that a more rigorous estimation methodology, one that controls for observed and unobserved time-invariant characteristics of youth, removes the bias in the naïve estimate, yet still finds a substantively important positive causal relationship between early work experience and subsequent employment for young people with disabilities.

Our findings indicate that the provision of early work experience to youth with disabilities who would not otherwise have such experience has a relatively large impact on their likelihood of being employed in subsequent years. To assess the relative size of the impact estimated from the fixed-effects analysis, consider those youth who were not employed in a paid job during the first year after enrollment in the YTD evaluation. Only 23.0% of those youth were employed during the third year after entry. The 17 percentage point estimate from the fixed-effects analysis implies that a hypothetical intervention providing those youth with work experience during the first year after entry would have increased their paid employment rate 2 years later to about 40% (a relative improvement of about 74%). In other words, such an intervention has the potential to substantially improve the likelihood of successful transitions to employment for young adults with disabilities who would not otherwise have early work experiences.

The findings from the fixed-effects analysis suggest that policies and interventions to help youth with disabilities obtain early work experience could play an important role in shaping their lifelong trajectories of employment and benefit receipt. The study sample consisted of youth receiving SSI, and the fixed-effects analysis provides evidence that an employment-focused intervention could improve their employment prospects 2 years later. To the extent that these employment gains persist during the youths' adult years, lifetime SSI payments would likely be reduced. Under SSI program rules, for every US$2 recipients earn, SSI payments are reduced byUS$1; thus, the more individuals work and earn, the greater the reduction in their SSI payments. Note that even with the reduced SSI payments, individuals would have greater income by combining those payments with their earnings. Thus, an investment in the human capital of youth and young adults with disabilities (by helping them obtain early work experience) may reduce the burden on taxpayers (by decreasing the amount of public assistance provided) while improving the youths' incomes in adulthood.

## Limitations

We note two limitations of the study. First, even though the fixed-effects analysis allowed us to account for time-invariant unobserved factors that may be correlated with employment status, it is unable to account for time-varying unobserved factors. For example, if a youth's motivation to engage in paid employment changes over time, our analysis would not be able to control for such changes. To the extent that this is applicable to the study sample, the estimated effects of early work experience on subsequent paid employment may be biased. Second, with irregular spacing of the panel data (1 year between the baseline and first follow-up surveys and 2 years between the first and second follow-up surveys), in applying the Anderson and Hsiao (1982) approach, we are assuming that the effect of prior employment on later employment is the same for the period between the entry and first year of data collection as it is for the period between the first and third years of data collection. We want to recognize these limitations of our study and draw conclusions with caution. Nevertheless, the fixed-effects analysis removes much of the bias associated with the naïve analysis and still yields a statistically significant and substantial estimated effect of early work experience on later paid employment for youth with disabilities who receive SSI.

## Future Research

The data used in our analysis reflect a relatively short time span between early work experience and subsequent employment outcomes. A longer time span would allow for a more comprehensive analysis of the effects of early work experience. For example, a longer time span would allow the analysis to reflect the fact that youth with disabilities may delay entering the labor force until age 22, after their eligibility for secondary education under the Individuals With Disabilities Education Act (IDEA) ends. Future research could potentially use longitudinal data for a much longer time span. For example, SSA administrative data on youth SSI recipients would support longitudinal tracking of employment outcomes for a cohort of youth SSI recipients from the late 1990s through 2015. Implementing the analytic approach used in the current study to such a database would allow for a rigorous assessment of how early work experience affects subsequent paid employment for a very large number of youth over a long time span.

Our analysis focuses only on the incidence of paid employment and does not explore the quality of the employment experiences young adults obtained. Although there is

great value in understanding the factors that shape whether young people with disabilities successfully enter the workforce, future attention should also be directed toward understanding those factors that lead young people to jobs that are personally satisfying and address their economic needs.

## Conclusion

Improving the postschool employment outcomes of young adults with disabilities has been a long-standing focus of policy and practice. To that end, the importance of early work experience is strongly supported by the existing research. However, much of that research is correlational rather than causal. This limits the utility of the available evidence for assessing the likely impacts of transition-related interventions, because correlational evidence leaves open the possibility that unobserved underlying factors (e.g., personal motivation, disability-related needs, and career-related skills) may explain the association between early work experience and later employment. In our study, we applied a dynamic-panel estimation approach that accounted for observed baseline socioeconomic and health factors as well as time-invariant unobserved characteristics to derive causal estimates of the relationship between early work experience and subsequent employment among youth with disabilities.

We found that providing early work experience to youth with disabilities has a substantial positive causal effect on their likelihood of being employed in subsequent years. Our analysis drew upon longitudinal data on youth with disabilities who were ages 18 to 20 and were receiving SSI payments. Comparing our results from analytic approaches that did and did not account for the potential influence of unobserved fixed characteristics, we conclude that the existing literature potentially overstates the effects of early work experience on later employment. At the same time, we found that even when we accounted for unobserved fixed characteristics, early work experience increases the likelihood of later employment by 17 percentage points among youth with disabilities. In other words, even with the more rigorous estimation method that accounted for observed and unobserved time-invariant characteristics of youth and removed the bias in the naïve estimate, we found that early work experience has a substantively important positive causal effect on later employment for youth with disabilities.

Connecting youth with disabilities to paid employment in the years during and shortly after high school is a principal goal of special education and rehabilitation services. Yet the employment outcomes that are central to thriving in adulthood remain elusive for substantial numbers of young people with disabilities. For practitioners and policymakers, findings from this study provide strong support for the value of early work experiences as a research-based pathway for improving the adult employment outcomes of young people with disabilities. Continued research is needed to determine how best to make these early connections to paid employment for transition-age youth with disabilities.

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### Notes

1. If we denote these unobserved individual characteristics by $c_i$, then the true relationship of interest from Equation 1 is given by $E_{i,3} = \theta E_{i,1} + \beta \mathbf{X}_{i,3} + c_i + \varepsilon_{i,3}$. If $c_i$ is correlated with both $E_{i,3}$ and $E_{i,1}$, then a naïve estimate of $\theta$ that does not account for that correlation will be biased.
2. More technically, we have a dynamic-panel data model with a lagged dependent variable as an explanatory variable. The Anderson and Hsiao (1982) approach for estimating this model involves differencing Equation 1 to account for the fixed individual characteristics and then using $E_{i,0}$ (employment status at entry) as an instrumental variable to account for potential serial correlation. To difference, we subtract lagged values of each term in Equation 1, which removes the fixed individual effects, and we get $E_{i,3} - E_{i,1} = \theta(E_{i,1} - E_{i,0}) + \beta(\mathbf{X}_{i,3} - \mathbf{X}_{i,1}) + (\varepsilon_{i,3} - \varepsilon_{i,1})$. For time-invariant individual characteristics, $\mathbf{X}_{i,3} = \mathbf{X}_{i,1}$, so this term drops out of the differenced version of Equation 1. Direct estimation of this modified model would still lead to a biased estimate of $\theta$ because the error term $(\varepsilon_{i,3} - \varepsilon_{i,1})$ is correlated with $(E_{i,1} - E_{i,0})$ as $E_{i,1}$ is a function of $\varepsilon_{i,1}$. The Anderson and Hsiao approach addresses this by using $E_{i,0}$ as an instrument for $(E_{i,1} - E_{i,0})$.

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