Does education pay for youth formerly in foster care? Comparison of employment outcomes with a national sample

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ABSTRACT

Each year tens of millions of federal dollars are invested to promote secondary and postsecondary educational attainment among older youth in foster care. Despite the presumption that this is a sound investment, as indicated by copious research from studies of the general U.S. population, research examining the payoff among youth transitioning to adulthood from state care has been sparse. In the present study, we analyze the relationship between educational attainment and employment outcomes among youth exiting care. Drawing on data from a large, multi-state study of youth transitioning from foster care, findings indicate that increased education, and particularly degree completion, is associated with greater earnings and lower employment rates. Compared to young adults matched on educational attainment from a nationally representative study, youth formerly in foster care earn about half and the employment rate is 20 points lower. However, increased levels of education have larger benefits for youth who exited care than youth from the general population, and at higher levels of attainment the two groups have similar employment rates and earnings gaps become less pronounced. Among youth formerly in care, results from regression analyses indicate that, compared to individuals with no high school credential, a GED or certificate of completion predicts no benefits in earnings or likelihood of being employed; a diploma predicts an earnings benefit; and some college, a two-year degree, and a four-year degree or greater predict large benefits in earnings and likelihood of employment. We conclude by briefly discussing implications for policy, practice, and future research.

1. Introduction

Over the past three decades a series of federal policy changes have been enacted to promote a more promising transition to adulthood for youth in foster care than the troubling outcomes documented in the not so distant past. A central focus of these policies includes preparing youth for gainful participation in the workforce, both directly through employment-related services and indirectly through initiatives intended to promote educational attainment. Given that tens of millions of federal dollars, supplemented by millions more in local and private funds, are disbursed each year to support the educational attainment of older youth in foster care, it is important to gauge the extent to which educational attainment translates into actual employment benefits.

Three questions motivate the present study. First, how do annual earnings and employment rates vary by level of education? Second, how does the association between education level and employment outcomes of youth who exited foster care compare to youth from the

general U.S. population? Third, what impact does level of education have on employment outcomes among youth formerly in foster care after accounting for a number of factors that could reasonably affect earnings and employment status?

2. Background

2.1. Brief summary of recent legislation

Two decades after foster care became federally reimbursable under Title IV-A of the Social Security Act of 1961, concern began to mount around the growing number of adolescents that languished in care without establishing permanent placements. Some of these youth in the "forgotten majority" would never be reunified with their family or taken in by an adoptive family (Hornby & Collins, 1981). Although the number of teenagers who aged out of care was but a sliver of the overall foster care population, studies conducted in the late 1970s and early 1980s shed light on the bleak futures that awaited many of these youth: high rates of high school attrition, long spells of unemployment, greater likelihood of criminal involvement and institutionalization, bouts of homelessness, and untreated mental health and substance abuse problems (Festinger, 1983; Kraus, 1981; Zimmerman, 1982). In

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a review of the literature on outcomes among older adolescents in foster care and youth who emancipated from care, Barth (1986) concluded that education and employment deficits were perhaps the most "troublesome problems for foster children to deal with as adults" (p.167). At the time, services intended to prepare adolescents for emancipation from foster care on their eighteenth birthday were a relatively new concept, were largely underdeveloped, and few young people received them (Festinger, 1983). Although not every study found that youth who aged out of care fared worse than their peers in all areas, enough evidence had mounted to alert researchers, advocates, and policymakers to the problem.

Since the mid-1980s, several federal laws have been enacted that are intended to support the transition to adulthood for older youth in foster care. First passed in 1986 and amended in 1990 and 1993, the Independent Living Initiative allocated $70 million each year for the provision of independent living services to youth aged 16 and older who were preparing to leave foster care. The Foster Care Independence Act (FCIA) of 1999 doubled federal funding to $140 million per year, gave states the option to offer independent living services to adolescents below the age of 16, and made it optional for states to extend Medicaid eligibility to the age of 21. In 2001 the Education and Training Voucher program was added to FCIA, which provided emancipated youth up to $5000 each year to the age of 23 to supplement the costs of postsecondary education and training. Two other important laws that specifically targeted higher education were the College Cost Reduction and Access Act (2007) and the Higher Education Opportunities Act (2008), which enables an older youth in foster care to file as an independent student on their FAFSA application and renders them eligible for federally-funded TRIO programs. The Fostering Connections to Success and Increasing Adoptions Act of 2008 represented a fundamental shift in foster care policy, providing states with the option to extend foster care up to the age of 21 and receive federal reimbursement for youth who meet educational or employment qualifications or who are medically exempt (Courtney, 2009; Geen, 2009). Finally, beginning in 2014, the Affordable Care Act extended Medicaid eligibility to age 26 for youth who were in foster care on their eighteenth birthday. The patchwork of recent legislation provides a much more substantial basis of support than what existed just a few decades ago, although the world has also changed in that time making educational attainment a far more exigent matter.

2.2. The effect of educational attainment on employment outcomes for the general U.S. population

The wide gaps in attainment that exist between young adults formerly in foster care as adolescents and their peers (e.g., Courtney, Dworsky, Brown, Carey, Love & Vorhies, 2012; Courtney, Hook & Lee, 2012; Day, Dworsky, Fogarty, & Damashek, 2011; Pecora, 2012) and the now canonical link between education and employment outcomes among young people and adults in the U.S. (Baum, Ma, & Payea, 2010; Taylor et al., 2012) underscore the focus on educational achievement that is present in the laws referenced above. National studies have quantified the employment and earnings benefits that accompany different levels of educational attainment. For example, the Bureau of Labor Statistics, U.S. Department of Labor (2013) calculated that the unemployment rate among workers aged 25 and over holding less than a high school education is 12.4%, which is higher than individuals with a high school diploma (8.3%), associate's degree (6.2%), and bachelor's degree (4.5%). Similarly full-time workers with less than a high school diploma earn an average weekly wage of $471, which is considerably less the average wages for individuals with a high school diploma ($652), an associate's degree ($785) and a bachelor's degree ($1066).

In studies that control for factors that may be related to level of education and employment outcomes, the advantages that accompany postsecondary education have been extensively verified (Hout, 2012). However, more gray areas exist in the benefits of different types of secondary credentials. Research has consistently shown that individuals with terminal high school diplomas earn significantly more than GED holders and students who drop out, both in the short-term and after accruing work experience (Boesel, Alsalam, & Smith, 1998; Cameron & Heckman, 1993). When individuals with a GED complete a college degree, they earn roughly the same amount as high school graduates who went on to earn a comparable college degree (Murnane, Willett, & Boudett, 1999; Murnane, Willett, & Tyler, 2000). However, individuals with a GED are less likely to pursue postsecondary education than individuals who finished high school, and among those who do enroll in college, GED holders are more likely to drop out (Berktold, Geis, & Kaufman, 1998; Murnane et al., 1999; Tyler & Lofstrom, 2010).

Research generally reports no earnings benefit for GED holders over individuals with no credential, at least in the short run (Cameron & Heckman, 1993; Heckman, Humphries, LaFontaine, & Rodríguez, 2008). Some studies suggest that the earnings advantage of a GED does not materialize until after individuals gain a few years of work experience (Boudett, Murnane, & Willett, 2000; Murnane et al., 1999; Tyler, 2004). Other studies find no statistically significant difference in earnings between GED holders and students who drop out even after several years (e.g., Heckman & LaFontaine, 2006). Completing a GED does appear to have a significant effect for students who score low in academic skills (Murnane et al., 1999, 2000; Tyler, Murnane, & Willet, 2000), potentially because the substantial effort invested to pass the GED translates into increased human capital that gives them a decided job market advantage over low performing students without a GED (Tyler, 2003).

Different theories have been advanced to explain the earnings gap between GED holders and high school graduates. One explanation is that a GED credential may "signal," true or not, potential deficiencies to employers in human capital, character traits, or other aspects (Tyler, 2003). A second theory is that there may be real differences in non-cognitive character traits like persistence, propensity to engage in risk-taking behavior, and self-efficacy (Heckman, Humphries, & Mader, 2011). GED holders are more similar to students who drop out of high school with no credential than to high school graduates, and the traits that led students to drop out are the same traits that lead them to earn less when they enter the job market. Another third explanation is that completing high school actually builds human capital and work-related traits such as consistency and dependability over and above GED preparation. High school students spend an average of 1080 h in the classroom each year and must meet attendance requirements, earn a minimal grade point average that marks competency in several content areas, and in many states, pass a high school exit exam in order to earn a diploma (Carroll, 1990, cited in Heckman et al., 2011). In contrast, first-time GED test takers spend just 25 h preparing for the exam (Zhang, Han, & Patterson, 2009), and earning a GED entails successfully passing an 8-hour exam covering five subject areas.[1]

2.3. The effect of educational attainment on employment outcomes for youth aging-out of foster care

While several rigorous, large-scale studies have examined the link between education and employment outcomes for young adults in the general U.S. population, far less systematic research assess this relationship for the specific population of young adults transitioning from foster

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[1] Beginning in January 2014, a new version of the GED replaced the previous version (last updated in 2002). While the core content areas that are essentially the same (reading and writing, math, science, and social studies), the 2014 GED is designed to be more challenging and places more emphasis on reasoning and analytic skills. Cutoff scores for each content area are based on the performance of a national sample of high school students who took the GED. The passing rates for the new GED, which are based on the performance of high school graduates who took the test in the summer of 2013, are comparable to the 2002 rates (GED Testing Services, 2014). Thus, while the 2014 GED has become more difficult, it is unclear whether the revisions will affect passing rates of actual GED test takers and whether certain groups (e.g., older test takers who were not exposed to the Common Core Standards curriculum) will be disproportionately affected.

care. A growing body of literature has documented educational aspirations and attainment (e.g., Courtney, Dworsky, et al., 2012; Courtney, Hook, & Lee, 2012; Day et al., 2011; McMillen, Auslander, Elze, White, & Thompson, 2003; Pecora, 2012; Salazar, 2013) and workforce engagement (e.g., Dworsy, 2005; Goerge et al., 2002; Macomber et al., 2008; Singer, 2006; Urban Institute, 2008) among youth transitioning from care, yet less research has specifically examined how education impacts employment outcomes. Two recent studies using data from the Midwest Evaluation of the Adult Functioning of Former Foster Care Youth (Midwest Study) analyzed predictors of employment. Naccarato, Brophy, and Courtney (2010) found that youth at age 21 who held a GED, high school diploma, completed some college, or earned an associate's degree were expected to earn significantly more than respondents with some high school but no degree. Hook and Courtney (2011) used multilevel modeling to analyze four waves of data from the Midwest Study to predict earnings and employment outcomes at age 23/24. They found that holding a high school credential (diploma, GED, or certificate) or higher predicted a greater likelihood of working 20 or more hours per week than respondents with less than a high school degree. However, neither a high school credential nor some college significantly predicted greater earnings. A third study by Salazar (2013) compared the employment status and earnings between 250 youth who participated in one of two scholarship programs for older foster care youth with subsamples of two general population surveys. The study was limited to individuals who were between 21 and 31 years of age and who had obtained a Bachelor's degree. Chi-squared analyses indicated that there were statistically significant differences in the employment statuses of the two groups, but analysis of covariance results indicated that they did not significantly differ in annual earnings.

The present study builds on this research by examining the employment status and annual earnings of young adults in the Midwest Study. In light of the emphasis placed on educational attainment as a vehicle for establishing economic self-sufficiency, we take an in-depth look at the employment outcomes by education level for youth formerly in care.

3. Method

3.1. Sample

The Midwest Study is the most comprehensive longitudinal evaluation to-date of adolscents making the transition out of foster care. Youth were eligible for the study if they had been in care for at least one year prior to their seventeenth birthday and resided in Illinois, Iowa, or Wisconsin. Youth were excluded from the study if they could not participate due to incarceration, psychiatric hospitalization or a developmental disability, or if they no longer resided in the state or ran away. Following the first wave of data collection in 2002 (n = 732, response rate = 95.4%), four subsequent waves occurred every two years until participants were aged 25 or 26 (for more detailed information about the study, see Courtney, Terao, & Bost, 2004; Courtney et al., 2005; Courtney et al., 2007; Courtney, Dworsky, Lee, & Raap, 2010; Courtney, Dworsky, et al., 2012; Courtney, Hook, & Lee, 2012). In the present study, employment outcomes are drawn from wave 5 data, which were collected from October 2010 to May 2011 when the average age of respondents was 26 years old. A total of 596 interviews were conducted, yielding a response rate of 83% of the original sample.[2] Respondents who were in the military or incarcerated at the time of the wave 5 interview, and were therefore not able to be employed, were not included in the analysis, dropping the sample size to 564.

Given the drastic economic downturn and volatile employment conditions that followed the start of the recession in 2008, it was critical that the dates of the data collection periods of the Midwest Study and the comparison study matched as closely as possible. Otherwise, it would be challenging to disentangle the effects of economic and labor market conditions from between group differences. The NLSY97 proved to be a fortuitous comparison group.

Conducted by the Bureau of Labor Statistics, the NLSY97 drew a nationally representative sample of 8984 adolescents aged 12 to 16 years old at the start of 1997. Follow-up interviews were conducted on an annual basis. Wave 14 of the NLSY97 was collected between October 2010 and June 2011, which is nearly identical to the field period of the fifth wave of the Midwest Study. The primary focus of the study is to track the transition from school to work. The response rate for wave 14 was 83.25% (n = 7479). At the time of the interview, participants ranged from ages 25 to 31. To match the Midwest sample on age, NLSY97 participants who were 25 or 26 years old were included (n = 1541). Excluding respondents who were currently in the military reduced the sample to 1514. Since the NLSY97 oversampled certain subpopulations, sample weights provided by the Bureau of Labor Statistics were applied so that results are representative of the national population.

4. Measures

4.1. Outcome variables

4.1.1. Current employment

Respondents in both NLSY97 and the Midwest Study were asked about their current employment status at the time of the interview. Just under half of the Midwest Study participants were employed (48.7%) compared to 70.0% of the weighted NLSY97 sample.

4.1.2. Earnings in the past 12 months

Respondents in the Midwest Study and NLSY97 reported their earnings over the past 12 months. In the Midwest Study, 162 reported no earnings (28.7%) and 396 stated that they generated income from employment in the past 12 months (70.2%). Among the latter group, 328 (82.83%) reported a specific earnings amount. An additional 68 (17.17%) respondents stated that they did not know the specific amount, but estimated their earnings from pre-specified ranges of $5000. The remaining two respondents (<1%) either did not know or refused to divulge their earnings. For the 68 respondents who selected an income range, the median value of the range was imputed as their earnings. For example, for a respondent selecting the "20,001–$25,000" range, $22,500 was entered as the income value.

In the NLSY97 sample, 345 reported zero earnings in the past year (22.5%) and 1169 respondents indicated that they had earned income from employment (77.2%). Among those reporting earnings, 1033 provided a specific earnings amount (88.37%), 133 selected an income range (11.5%), and 5 either did not know or refused (<1%). Similar to the strategy used for the Midwest Study, median values for earnings ranges were imputed for 133 cases. Unlike the Midwest Study that had constant ranges across earning amounts, the NLSY97 ranges widened as earnings increased. Approximately 42% of imputed incomes fell into the first two ranges that were identical to the Midwest Study ranges, but the remaining 58% (n = 77) fell in ranges that were wider than $5000. Thus, for these cases it is likely that using the range medians yields more error (i.e., the difference between their actual earnings amount and the imputed range median) than did the narrower Midwest Study ranges. However, in the context of all NLSY97 earnings, these 77 cases represent just 6.6% of the data when zero earners were excluded and 5.1% of the data when zero earners were included.

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[2] The 83% response rate is based on the non-deceased members of the original sample. Since 12 respondents were known to have died by wave 5, the response rate was calculated based on a sample of 720 (Courtney, Dworsky, et al., 2012; Courtney, Hook, & Lee, 2012, p.4).

4.1.3. Predictor variables

4.1.3.1. Educational attainment. Six categories are used to indicate the highest level of education reported at the time of the interview: some high school but no credential, GED certificate or certificate of completion, high school diploma, some college but no degree, two-year degree, and four-year degree or higher.

4.1.3.2. Control variables. Descriptive statistics for variables included in the regression analyses can be found in Table 1.

4.1.3.3. Demographic characteristics. Gender, race, and age were included as demographic covariates. Race was divided into three categories: African American, White, and American Indian or Alaskan Native and Asian or Pacific Islander (labeled Other in Tables 1 and 3).

4.1.3.4. Foster care experience. Four variables were included in the regression analyses that captured aspects of the Midwest Study participants' foster care experience, including their state of residence, placement type at the time of the baseline interview, the number of placements

Table 1
Descriptive statistics for Midwest Study participants.

	%	Mean (s.d.)
Outcomes (age 25/26)		
Currently employed	48.7%	
Annual earnings (w/ $0 earners)		$9933 ($611.01)
Predictors (age 25/26)		
Highest education		
Some HS	16.5%	
GED/certificate	10.8%	
HS diploma	30.9%	
Some college	32.8%	
2 yr degree	4.6%	
4 yr degree +	4.1%	
Covariates (age 17)		
Female	58.5%	
African American	59.6%	
White	36.2%	
Other	4.2%	
Age		
State: IL	62.8%	
State: WI	27.8%	
State: IA	9.4%	
Placement type		
Foster home w/ nonkin	37.6%	
Foster home w/ kin	31.4%	
Group home/residential	16.5%	
Independent living/adoptive home/other	14.5%	
Number of placements		5.70 (5.87)
Years past 18		1.49 (1.39)
Has child	15.4%	
Ever had a job	82.4%	
Social support (range: 0–8)		6.21 (1.93)
Relationship demands (range:0–6)		2.06 (0.94)
Repeated grade	36.9%	
Reading level		
<6th grade	34.7%	
6th–8th grade	25.0%	
HS	23.8%	
Above HS	16.5%	
Education ILS (range:0–5)		1.22 (1.47)
Employment ILS (range:0–8)		3.16 (3.0)
Conviction	20.2%	
Currently enrolled (age 25/26)	18.1%	
Physical abuse	33.3%	
Neglect	55.0%	
Sexual abuse	31.4%	
Depression	9.6%	
PTSD	16.3%	
Alcohol abuse/dependence	12.9%	
Substance abuse/dependence	12.9%	

they experienced while in care, and the number of years they remained in care past the age of 18. The state of residence has important implications. At the time of the study, participants residing in Illinois had the option of remaining in care up to the age of 21, while participants residing in Iowa and Wisconsin generally exited care on or around their 18th birthday. The type of placement where the participant resided at the time of the baseline interview include four categories: foster home with non-relatives; foster home with relatives; group care or residential treatment; and independent living arrangement, adoptive home, or another placement type. As would be expected, the average time in care past age 18 for youth in Illinois (2.26 years, s.d. = 1.15) was larger than the averages for Wisconsin (0.13 years, s.d. = .53) and Iowa (0.32 years, s.d. = .49).

4.1.3.5. Wave 1 background variables. Several measures from Wave 1 of the Midwest Study were used as control variables, including whether respondents were ever convicted of a crime, received employment independent living services (ILS), received education ILS, repeated a grade, had a child, and had ever held a job. Measures of reading level and perceived social support were also included. Ever convicted of a crime, ever repeated a grade, ever had a child, and ever held a job were each coded as dummy variables. During the Wave 1 interview, respondents were asked if they received one or more of a number of independent living services, including several ILS that were intended to promote educational attainment (e.g., study skills, SAT preparation, assistance with college applications) and employment (e.g., interviewing skills, resume preparation, internships). The six types of education ILS services were top coded at five, with most respondents reporting that they received no services (n = 256, 45.4%). The twelve types of employment ILS services were top coded at eight, with zero services as the most frequent response (n = 178, p = 31.6%). The education ILS and employment ILS scales had Cronbach's alphas of .702 and .873, respectively. Reading ability was measured using the word reading task of the Wide Range Achievement Test (WRAT) (Wilkinson, 1993). Respondents were grouped into four reading levels: below sixth grade, sixth to eighth grade, high school, and above high school. Perceived adequacy of social support was measured by four items in which respondents indicated whether there were enough, too few, or no individuals that could be counted on to listen to problems when they were low, help with small favors, loan them money in an emergency, and encourage them in meeting goals. The four items were combined into a single score with a range of 0 (no one they could count on for all four types of support) to 8 (enough people they could count on for all four types of support). Cronbach's alpha is .748 for the social support scale. Finally, a composite measure of relationship demands was created from two items that asked respondents about the extent to which other people need help from them with small favors and need to borrow money from them. The scores ranged from 0 (no relationship demands) to 6 (high relationship demands in both areas). Given that the composite scale of relationship demand consisted of just two items and Cronbach's alpha may be inappropriate, we calculated the Spearman-Brown Coefficient instead (Eisinga, Grotenhuis, & Pelzer, 2013). The coefficient was relatively small for the relationship demands scale (.494). As a result, we ran the Tobit and Logistic regression analyses (a) using the relationship demands scale, and (b) with the original relationship demands items as separate variables. The differences were negligible, and since relationship demands is not the focus of the study we retained the scale for relationship demands in the estimates below.[3]

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[3] Using the composite variable or the individual items for relationship demands did not change the statistical significance of the educational attainment variables and did not substantially alter the point estimates for each education variable. Note that in the logistic regression model, the composite variable was a marginally significant predictor of likelihood of current employment (p = .095); the individual items were not significant. In the Tobit regression model, neither the composite variable nor the individual items were statistically significant.

4.1.3.6. Wave 1 maltreatment and mental health. Eight items that captured mental health, substance use, and maltreatment at age 17 were also included in the model. Depression, posttraumatic stress disorder, alcohol abuse and dependence, and substance abuse and dependence were captured using the World Health Organization Composite International Diagnostic Interview (CIDI), which is an assessment tool for nonclinicians that assess mental health conditions using DSM-IV criteria (World Health Organization, 1998).[4] Each of the four conditions were dummy coded, with respondents receiving a "1" if they had a positive screen for the given condition. Maltreatment questions asked respondents about ways their caregivers may have mistreated them prior to entering care, and included dummy-coded measures of neglect, physical abuse, and sexual abuse.

4.1.3.7. Wave 5 enrollment status. Respondents were asked about whether they were currently enrolled in school at the time of the Wave 5 interview. Over 100 respondents were currently enrolled (18.1%), with the majority pursing a two-year or four-year degree.

5. Data analysis

The first part of the analysis involves evaluating descriptive statistics from the Midwest Study. Employment status at the time of the interview and 12-month earnings are separated by level of educational attainment. The second part of the study involves comparing employment status and earnings by level of education between the Midwest Study participants and the NLSY97 participants. To test the association between level of education and employment outcomes for Midwest Study data, a Fisher's exact test (F-test) was executed for each employment outcome. The F-tests were statistically significant for both average earnings and employment rate (p < .001). Since applying the NLSY97 sample weight generates values that approximate population parameters, no statistical analyses are required to evaluate differences in employment outcomes across levels of education.

The third part of the study entails estimating the expected annual earnings and the likelihood of unemployment for different levels of educational attainment after controlling for a variety of factors. Logistic regression is used to predict the log odds of unemployment at the time of the interview and Tobit regression is used to model the relationship with earnings as the dependent variable. Tobit regression models are commonly used with constrained dependent variables (e.g., Amemiya, 1984; Kinsey, 1981; McDonald & Moffitt, 1980; Tobin, 1958). In the present analysis, earnings are censored from below at zero and zero is a common value, with 28.72% of respondents reporting no earnings over the past 12 months. Tobit regression uses maximum likelihood estimation to derive estimates of the beta coefficients that incorporate information on both the likelihood of a respondent earning zero dollars and the quantitative difference in earnings among those who had positive earnings. A latent value of earnings is generated for each individual and Tobit regression uses these latent values (not the observed values) in estimating the beta coefficients. Tobit models avoid problems that can arise when OLS regression is used with censored dependent variables (e.g., biased and inefficient estimates) (Amemiya, 1984; Kinsey, 1981).

In selecting the education level variable, one decision point was whether to use a lagged (Wave 4) or current (Wave 5) measure of educational attainment. This is a concern for participants whose education status *changed* from one wave to the next (e.g., diploma to some college). If Wave 4 education status was used, it would be assumed that employment outcomes at Wave 5 are reflected in the education level from two years prior (i.e., that participants did not accrue additional education that impacted outcomes). However, 17.7% of participants reported a higher education status at age 25 than they reported at age 23. In this case, employment benefits may be *overestimated* by using Wave 4 education status. On the other hand, if Wave 5 education status is used, it would be assumed that earnings over the past year are reflected in current attainment level. However, if they recently advanced in education status, then the 12-month earnings and their current employment status would likely reflect their prior status at Wave 4 rather than their newly conferred status. In this case, employment benefits may be *underestimated* by using Wave 5 education status.

Since specific information about the timing of changes in education status is not available, examination of extant data guided our decision about whether to use a current or lagged education status measure. We examined the number and distribution of respondents who changed education status between the two waves. Education information from both waves was available for 90% of the respondents (n = 508). Over the two years, the majority of these respondents did not change education status (82.3%). However, a nontrivial percentage (17.7%) did change statuses from Wave 4 to Wave 5. The most common change entailed respondents with a high school credential at Wave 4 (diploma, GED, or certificate of completion) completing some college but no degree by Wave 5 (54% of status changes). The earnings and employment rate for these advancers much more closely resembled the Wave 5 employment profile of individuals with some college than the profile of individuals with a high school credential.[5] This and other information from comparative regression analyses led us to conclude that using education status from Wave 5 was an appropriate choice.[6]

In the Tobit regression model, the four behavioral health variables (depression, PTSD, alcohol abuse/dependence, and substance abuse/dependence) and the physical abuse dummy variable did not significantly improve the fit of the model and were excluded from analysis for parsimony. In the logistic regression model, none of the behavioral health, maltreatment (abuse and neglect), and sexual assault dummy variables significantly improved model fit and these seven variables were excluded.[7] The final Tobit regression contained 515 cases (49 cases, or 8.7% of the study sample, had some missing data) and the final logistic regression model included 539 cases (25 cases, or 4.4% of the sample, had missing data).

Coefficients in the Tobit regression model are calculated based on uncensored latent earnings. To interpret the beta coefficient in the Tobit model, the value of the coefficient is multiplied by the probability of a nonzero observation in the sample (.713) (McDonald & Moffitt, 1980). For example, individuals with a four year degree or higher are expected to earn $20,326 more than individuals without a high school credential, controlling for the covariates in the model ($28,507 × .713). The coefficients of logistic regression in Table 3 are expressed as the log odds of employment. To ease interpretation, we discuss these findings in terms of odds ratios (OR), which are computed by taking the exponent of the log odds. For example, exponentiating the coefficient for some

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[4] Skip pattern errors in the baseline survey instrument precluded diagnostic assessments to be completed for a number of youth on depression (n = 330) and substance abuse (n = 338). However, callback interviews successfully collected diagnostic information for the majority of these missing cases (78% for depression and 70% for substance abuse). There were no statistically significant differences on a number of characteristics between participants who were re-interviewed and participants who were not. See Keller, Salazar, and Courtney (2010) for more details.

[5] The average earnings ($12,496) and employment rate (55.6%) of individuals who changed from a high school credential at wave 4 to some college at wave 5 was not significantly different from the other individuals with some college at wave 5 ($12,790, p = .434; 62.1%, p = .902), but it was quite different from the employment outcomes of those with a high school credential at wave 5 ($7,814, p = .025; 41.3%, p = .077).

[6] Although not reported here, we ran two sets of logistic and Tobit regression models: one set that used wave 4 education status and another set that used wave 5 education status. Results were consistent between models that used wave 4 and wave 5 education statuses: GED was not a significant predictor of earnings or employment status; high school diploma was a significant predictor of earnings but not employment status; and some college and college degree were both significant predictors of earnings and employment status. Although point estimates and standard errors were not identical between the models, overall, consistent findings about the influence of different education statuses were found regardless of whether wave 4 or 5 education status was used.

[7] In the Tobit regression model, the F-test for the five excluded variables yielded a p-value > .10. Similarly, the chi-squared test of the seven excluded variables in the logistic regression model yielded a p-value > .10.
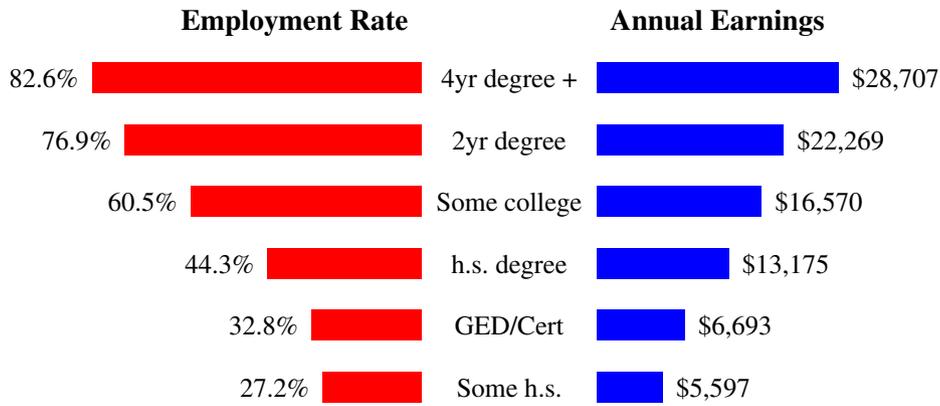
Employment Rate   **Annual Earnings**

	Employment Rate		Annual Earnings
82.6%		4yr degree +	$28,707
76.9%		2yr degree	$22,269
60.5%		Some college	$16,570
44.3%		h.s. degree	$13,175
32.8%		GED/Cert	$6,693
27.2%		Some h.s.	$5,597

Fig. 1. Midwest Study: employment outcomes by level of education. [10] Respondents with zero earnings are not included in the Annual Earnings calculations.

college (1.1640) yields an odds ratio of 3.20, which indicates that the odds of employment for those with some college is 3.2 times the odds of employment for those without a high school credential (the reference group).

6. Results

6.1. Midwest Study: analysis of employment outcomes by level of education

Among Midwest Study participants, 16.5% have some high school, 10.8% earned a GED or certificate, 30.9% earned a high school diploma, 32.8% completed at least one year of college but did not earn a college degree, 4.6% obtained a two-year college degree, and 4.1% earned a four-year degree or higher. Fig. 1 displays the annual earnings reported over the past 12 months and employment status (working 10 or more hours) at the time of the interview, broken down by level of education. Complete data on education and current employment status is available for 548 of the 564 respondents in the sample (97.2%). The likelihood of current employment increases with educational attainment. Those with no credential and a GED or certificate of completion have comparable employment rates (27.2% and 32.8%, respectively), whereas those with a high school diploma have more than a 10 point increase in employment rate compared to GED holders (44.3%). Slightly under two-third of respondents with some college (60.5%), three-quarters of respondents with a two-year degree (76.9%), and four-fifths of respondents with a four-year degree or higher (82.6%) are employed 10 or more hours.

The annual earnings reported in Fig. 1 exclude the 162 respondents who earned $0 in the past 12 months (N = 396). Respondents with no credential and a GED differ by roughly $1100 in earnings, while those with a high school degree earn almost double that of GED holders. Individuals with some college earn about $3500 more than those with a

diploma. The difference in earnings between participants with some college and those who completed a college degree is about $5700 for a two-year degree and $12,100 for a four-year degree or higher.

One-hundred nineteen of the 162 respondents who reported no earnings in the past 12 months fall into one of the bottom three education categories (73.5%), so when zero earners are included the largest decreases in average earnings occur in the bottom three groups. Among the 562 respondents with both education and earnings data (99.6% of the sample), average earnings drop to $2829 among those without a high school credential, to $5047 among those with a GED or certificate, to $8783 among those with a high school diploma, to $12,719 among those with some college, and to $18,843 among those with an associate's degree. No respondents with a four-year degree or higher reported earning $0 over the past year. Thus, when including the zero earners, disparities in average earnings between individuals with different education levels only become more pronounced. Earnings of participants with a high school diploma are more than triple the earnings of those with no credential. Youth with some college earn nearly 1.5 times the earnings of those with a high school diploma, youth with a two-year degree earn more than double the earnings of those with a diploma, and youth with a four-year degree or higher earn more than triple the earnings of diploma holders.

6.2. Midwest Study vs. NLSY97: employment outcomes by level of education

Weighted estimates from the NLSY97 sample indicate that 9.0% of young adults have some high school but no credential, 8.5% earned a GED, 23.3% earned a high school diploma, 23.4% have some college but no degree, 8.0% completed a two-year college degree, and 27.8% earned a four year college degree or higher. When comparing employment statistics between the two studies, three major trends emerge. First, youth who aged out of care have lower rates of employment and lower
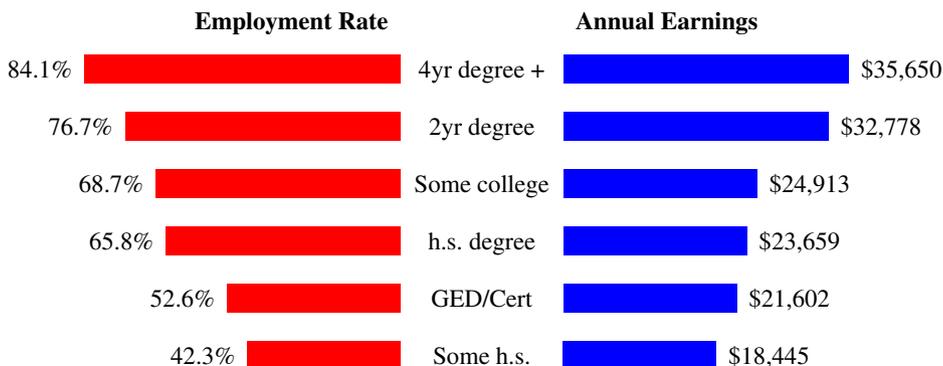
Employment Rate   **Annual Earnings**

	Employment Rate		Annual Earnings
84.1%		4yr degree +	$35,650
76.7%		2yr degree	$32,778
68.7%		Some college	$24,913
65.8%		h.s. degree	$23,659
52.6%		GED/Cert	$21,602
42.3%		Some h.s.	$18,445

Fig. 2. NLSY97 study: employment outcomes by level of education. [11] Respondents with zero earnings are not included in the Annual Earnings calculations.

Table 2
Midwest Study vs. NLSY97: absolute differences and relative percentage differences in employment outcomes comparing two levels of education.

	Midwest		NLSY97	
	Employment	Earnings	Employment	Earnings
Some HS vs. diploma	.171 (163%)	$7578 (235%)	.235 (156%)	$5214 (128%)
Diploma vs. some college	.162 (137%)	$3395 (126%)	.029 (104%)	$1254 (105%)
Diploma vs. 2-yr degree	.326 (174%)	$9094 (169%)	.109 (117%)	$9119 (139%)
Diploma vs. 4-yr degree	.383 (186%)	$15,532 (218%)	.183 (128%)	$11,951 (151%)

earnings than their peers (see Figs. 1 and 2). Overall, just under half of Midwest participants are currently employed (48.7%) compared to over three-quarters of weighted estimates of the NLSY97 study (70.0%). Excluding respondents who reported no earnings over the past year, the average earnings for former youth in foster care is half that of the general population of young adults aged 25 or 26 ($14,148 vs. $28,105). When zero earners are included, former youth in foster care earn less than half of the general population of same-aged peers ($9969 vs. $22,169).

The second observation is that higher levels of education have a more pronounced effect on earnings and unemployment among youth in the foster care sample than in the general population (see Fig. 1). The overall pattern of employment and earnings within the foster care group resembles an inverted pyramid with steep steps; advancement from one level of education to the next is associated with a large increase in earnings and average employment. In contrast, the slope of the inverted pyramid of the general population group is more gradual (see Fig. 2). Table 2 quantifies some points of difference in the steepness of the inverted pyramid of the Midwest Study group compared to the steepness of the NLSY97 group. Displayed in Table 2 are the absolute differences and the percentage increases when two education levels are compared. Both measures are informative. The absolute differences tell us the actual differences in earnings/employment rates between the two levels of education, and the percentage increase considers the differences in relation the earnings of the lower level of education. Thus, when considering earnings between individuals with a high school diploma and a two-year college degree, the actual differences in earnings between the Midwest Study and the NLSY97 are quite similar ($9094 vs. $9564), but the percentage increase among the youth who aged out of foster care has a larger relative magnitude (169% vs. 140%). This results from the earnings of the lower level of education (diploma) for youth in the Midwest Study is less than that of youth in the NLSY97, so a comparable increase in earnings in the two groups will have a larger relative impact for the Midwest Study youth. An increase in level of education for youth formerly in foster care translates into larger benefits in employment outcomes than for youth in the general population.[8]

The third trend that emerges in the comparison of the Midwest Study and NLSY97 is that higher levels of educational attainment

narrow the gaps in earnings and employment rates between the two groups. The gaps are greatest at the lowest levels of education, but narrow at the level of some college and above. The annual earnings of NLSY97 participants is 1.8 times the earnings of Midwest Study participants at the level of high school diploma, 1.5 times the earnings at some college and a two-year degree, and 1.25 times the earnings at the level of a four-year degree or more. The differences in current employment rates are substantial at the high school diploma level and below (a 15 percentage point difference or greater at each level of education), and the difference drops to 8.2 percentage points for individuals with some college. Employment rates are basically equivalent across the two studies among college degree holders.

6.3. Midwest Study: predicted employment and earnings by level of education

Although the figures reported above for Midwest Study participants are informative, they are likely influenced by a number of other factors related to both education and employment. In both the logistic regression and Tobit regression models, the education coefficients reflect partial effects after accounting for a number of demographic characteristics, foster care experiences, background features, mental health conditions, and maltreatment experiences.

Results from the logistic and Tobit regressions are reported jointly in Table 3. After controlling for the covariates in the model, there is no statistically significant difference between participants with no high school credential and participants with a GED in expected latent earnings ($3202; p = .300) or likelihood of employment (OR = 1.05; p = .900). Obtaining a high school diploma predicts significantly greater latent earnings than having only some high school ($5836; p = .024), but yields no significant advantage in the likelihood of being currently employed (OR = 1.49; p = .206). Completing some college is a significant predictor of both earnings and employment. Compared to youth without a high school credential, those with some college are expected to earn significantly more ($11,179; p < .001) and are significantly more likely to be employed (OR = 3.120; p < .001). Individuals with a two-year college degree are expected to have significantly higher latent earnings ($19,336; p < .001) and are more likely to be employed (OR = 6.61; p < .001) than individuals with no high school. The greatest benefit in latent earnings ($28,507; p < .001) and employment status (OR = 8.31; p < .001) comes from holding a four-year degree or higher.

Since one in three (32.8%) Midwest Study participants completed some college but had not earned a degree by age 25/26, we wanted to test whether attending college had employment benefits relative to other degree statues. We ran two additional regression models that were identical to the models reported in Table 3 but in which some college was designated as the reference group. Having some college yields a statistically significant earnings benefit over no high school credential ($11,178; p < .001), a GED or certificate ($7976; p = .004), and a diploma ($5343; p = .01); conversely, holding a two-year degree predicts significantly greater latent earnings than some college ($8157; p = .025), as does holding a four-year degree or higher ($17,329; p < .001). In terms of likelihood of employment, individuals without a high school credential (OR = .312; p < .001), a GED or certificate of completion (OR = .328; p < .001), and a high school diploma (OR = .466; p = .002) all have lower odds of being employed than individuals who completed some college. No statistically significant differences are found in the likelihood of employment between individuals with some college and those with a two-year college degree (OR = 2.06; p = .159) or a four-year degree (OR = 2.59; p = .110). However, these nonsignificant findings can likely be attributed to the small sample sizes of the two-year (n = 26) and four-year (n = 23) college groups, which increase the

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[8] These differences could also be conflated with differences in factors other than foster care status, such as demographic characteristics. For example, nearly 60% of the Midwest Study identified as African American (vs. 27.8% in NLSY97). Given racial disparities in employment outcomes in the U.S., generating adjusted estimates that were balanced on race may reduce the differences in estimates between the two studies. However, we opted against this both because (a) African Americans are overrepresented in foster care relative to their composition of the general population, and (b) the sample from the Midwest Study was a random sample that reflected the actual racial breakdown in three states. Thus, rather than artificially adjusting the foster care sample so that it was proportionate with the population along race and other characteristics, we decided to present raw data so that estimates would reflect the actual composition of the population (NLSY97) and would represent the foster care population in three states (Midwest Study).

Table 3
Employment outcomes regressed on education status (Midwest Study).

Predictor	Tobit regression (latent earnings) n = 515	s.e.	Logistic regression (log odds of emp.) n = 539	s.e.
	Coefficient		Coefficient	
Education status (ref: some h.s.)				
GED	3202.36	3084.43	.0484	.3847
High school diploma	5835.71*	2585.63	.4002	.3165
Some college	11178.52***	2631.48	1.1640***	.3210
Two-year college degree	19335.90***	4064.32	1.8881***	.5597
Four-year college degree	28507.37***	4365.16	2.1173***	.6476
Demographic characteristics				
Female	−1937.08	1773.15	.3084	.2064
Race: Afr. Amer. (ref: White)	−3527.73	2113.87	−.1825	.2582
Race: Other (ref: White)	1930.92	2661.46	.0554	.3375
Age	75.76	193.28	−.0168	.0242
Background (at age 17)				
Has child	−3592.52	2306.43	−.3948	.2788
Conviction	2276.48	2014.32	.1059	.2470
Repeated a grade	−2077.55	1697.44	.0239	.2071
Ever had a job	2485.90	2136.27	.5660*	.2641
Reading level: 6–8 (ref: <6)	2943.05	2092.09	−.2139	.2581
Reading level: h.s. (ref: <6)	3561.83^	2146.71	−.2126	.2642
Reading level: h.s. + (ref: <6)	5244.34*	2405.24	−.1374	.3033
Adequacy of social support	876.14*	431.19	.0723	.0525
Relationship demands	739.25	847.70	.1747^	.1045
Foster care experience				
State: IA (ref: IL)	6453.78*	3229.86	.8744*	.4137
State: WI (ref:IL)	89.57	2725.20	.3933	.3278
Placement: kin (ref: nonkin)	263.31	1967.01	−.1516	.2423
Placement: group (ref: nonkin)	−2810.42	2434.65	−.6017*	.2954
Placement: other (ref: nonkin)	−530.83	2472.49	−.4903	.3132
Number of placements	−181.06	147.04	−.0089	.0175
ILS: education	−123.82	610.63	.1074	.0775
ILS: employment	116.21	312.31	−.0906*	.0396
Years past 18	−377.14	919.34	−.0298	.1094
Current school status				
Enrolled	1460.83	2022.27	−.0742	.2603
Past maltreatment/victimization				
Neglect	3592.08*	1639.99	–	–
Sexual abuse	−4292.87*	1981.98	–	–
Pseudo R-squared	.0174		.123	

^ p < .10.
* p < .05.
*** p < .001.

standard errors and render it more difficult to attain statistical significance.[9]

7. Discussion

In light of the confluence of federal policy and local initiatives promoting educational attainment as a vehicle to self-sufficiency among older youth in care, the current paper serves as an important study of the link between education and employment outcomes. To gauge whether education does pay, we analyzed data from the largest longitudinal investigation of older youth in care. Outcomes from a nationally representative study of same-aged peers served as a point of comparison. Analysis of descriptive data reveals that employment rates and yearly earnings vary markedly by level of education. Each step up the ladder of educational attainment confers additional benefits, but not all steps are equally spaced apart. The most pronounced benefits are associated with degree attainment. In particular, the gap between some high school and a diploma, and the gaps between some college and a two- and four-year degree are especially pronounced; each is associated with a 15-plus percentage point jump in rate of employment and a several thousand dollar difference in annual earnings. Overall, education

[9] A separate logistic regression analysis was run in which two-year and four-year college variables were collapsed into a single group. With this larger sample size (n = 49), completing a college degree yields a statistically significant difference in likelihood of employment over some college (OR = 2.28; p = .041).

does pay, particularly when youth attain the degree they are working toward.

When matched against peers across the nation, who faced similar economic and historical conditions, and who held similar levels of education, the present study reports that youth who exited foster care earn roughly half that of young adults in the general population. This holds both when zero income earners are omitted ($28,105 vs. $14,148) and when they are included ($22,169 vs. $9969). Furthermore, the rate of current employment is a full 20 points higher for the group of nationally representative young adults (48.7% vs. 68.0%). A closer examination by level of education reveals discernable patterns between the two groups. In particular, the inverted pyramid – formed by the rate of employment on one side and annual income on the other – is markedly steeper for youth with foster care experience than for their peers. Although gaps between the two groups in earnings and employment rates are large at the lowest levels, the disparities narrow at the higher levels of the educational pyramid. In particular, completing a two-year or a four-year degree equalizes rates of current employment and substantially reduces the gaps in annual earnings.

There are many potential reasons for these large gaps in employment outcomes between youth in care and the general population, even when they hold similar levels of education. Explanations might include higher rates of mental health difficulties, residential and educational instability, grade repetition, and early parenthood. Youth in foster care may also be more likely to come from families with limited economic, human, and social capital that are critical for educational

advancement, and may be more likely to have resided in low resourced neighborhoods and attend underperforming schools. These youth may return to neighborhoods where there are fewer opportunities to access stable employment that offers decent wages. While young adults with the same level of educational attainment were compared across studies, it may be the case that, on average, youth in the general population attend secondary and postsecondary schools that confer more human capital and employment networking opportunities that make it easier to obtain steady, well-paying jobs than youth with foster care backgrounds. Whether the foster care experience itself contributes to these young people not realizing the same returns to education as their peers remains unclear. These and other factors are tenable explanations for the wide gulf in employment outcomes reported in this analysis that future research will need to untangle.

Perhaps the most compelling evidence of the benefit of increased education among youth formerly in foster care comes from the results of the regression analyses, which displays the effect of different levels of education after controlling for multiple covariates and potential confounders. The results from this study display clear and significant benefits of postsecondary education on both employment status and earnings. When comparing the three secondary credentials (no credential, terminal GED or certificate of completion, and terminal diploma), our analysis suggests that (a) a high school diploma predicts higher earnings than having no credential; (b) a GED or certificate of completion yield neither higher earnings nor a greater likelihood of being employed over no credential. These findings are consistent with the findings of large-scale studies of the general U.S. population (e.g, Boesel et al., 1998; Cameron & Heckman, 1993).

The finding that the GED certificate yields no statistically distinguishable earnings or employment advantage over no credentials was somewhat surprising, particularly since several years had elapsed since most of the youth had earned their certificate (see GED and certificate completion rates in Waves 2, 3 and 4 of the Midwest Study). We expected that by ages 25 and 26, benefits of earning a GED over no credential would have materialized, as some studies of the general population have reported (Boudett et al., 2000; Murnane et al., 1999; Tyler, 2004). The benefit of these years is likely associated with accruing work experience and establishing an employment history, not just the mere passing of time. However, at least at the time of the survey, under one-third of Midwest participants with a terminal GED were employed (32.8%), which was a full 20% lower than the rate of employment among NLSY97 participants with a terminal GED (52.6%). If this gap is indicative of the employment rate gap for the previous several years, it may be the case that Midwest Study participants did not accrue sufficient employment experience needed for the benefit of their GED to become realized.

Given that our findings indicate that earning a high school diploma yields earnings benefits above and beyond no credential and no statistically significant benefits emerge from holding a GED or certificate of completion, one implication is that indiscriminate emphasis on secondary credential completion – by whatever route – may be a disservice to our young people expected to age out of foster care. Said differently, if we know that earning a high school diploma will leave older youth in foster care better poised to attain self-sufficiency, then policies and practices may need to explicitly prioritize completing high school. Further research is needed in this area to determine whether the findings reported here hold in different states, local job markets, and economic climates. Moreover, there are some circumstances where earning a high school diploma may not be feasible (e.g., a youth reaching the state maximum age limit for high school; districts without programs or support for pregnant and parenting students) and pursuing an alternative credential is a reasonable choice. Far more cases likely fall in the gray area where high school completion and GED certification are both viable (although not equally easy) options. Ensuring that youth remain in and complete high school may require revisions in policies and procedures, redoubled efforts on the part of child welfare agencies and other advocates, increased collaboration with school systems and personnel,

buy-in from the youth, and in some cases enhanced academic and behavioral support services. However, remaining in high school will likely cultivate job-related skills and human capital that benefit youth when they enter the job market, and can also leave them more poised and better prepared to succeed in postsecondary education settings if they choose to continue their education beyond high school.

In light of the findings reported above, there are several study limitations to note. First, estimated income, employment status, and level of education are self-reported and likely contain some error. For example, seven participants in the Midwest Study reported that their highest level of education was a high school diploma at Wave 4 and a GED at Wave 5. It is not improbable that similar errors are sprinkled throughout both samples due to self-reporting. Second, estimating earnings by imputing median values from an earning range will introduce error. It is likely that there is more error in the NLSY97 estimates, particularly for salaries that were imputed above $10,000 when the category ranges widened to larger interval relative to the Midwest Study categories. Third, the education, labor force participation, and earnings data for both samples was collected during a time of acute economic hardship. The magnitude of the relationships between level of education and employment may change in less extreme socioeconomic conditions. On the other hand, this study may reflect the robust effect of higher levels educational attainment even in tough economic times, particularly for college attendance and completion. Fourth, by deciding to measure annual earnings rather than a point-in-time estimate of wages or salary, we are unable to disentangle the contribution of wage rate versus duration of employment. For example, annual earnings of $30,000 over the past year could result from working two jobs at minimum wage for 12 months, working one job for six months at a salary of $60,000, or any number of combinations. In future research, data capturing income dynamics (e.g., week-by-week data on employment status, number of hours worked, and current wage/salary) would be instrumental in providing a rich, complex analysis of earnings patterns over time. Fifth, the two measures of independent living services included in the regression analyses do not control for the effect of selection bias and do not gauge the quality and intensity of services. Ironically, receipt of employment ILS services by age 17 predicted a *decreased* likelihood of being employed at age 25/26. It may very well be the case that respondents who received services were those most in need of the services and who experienced the most difficulty obtaining and maintaining employment. It may also have been the case that the services they received were not at a sufficient dosage to have a meaningful impact on preparing them to find a job. Sixth, there may be additional factors that have not been accounted for as statistical controls. A prime example of a potential confounder is the quality of primary schooling (Smithgall, Gladden, Howard, Goerge, & Courtney, 2004). Although reading ability scores would likely capture some of the effect of the quality of earlier education, there may still be unmeasured influence that was not captured in our measures.

This study supports the general benefit of increased levels of education on employment outcomes, and specifically the benefit of completing a degree versus having some education with no degree. However, two important caveats are in order. First, the lower levels of educational attainment (and subsequent employment and earnings) among Midwest Study participants probably reflect a combination of socioeconomic effects (e.g., neighborhood effects, family poverty, attending lower performing schools) and foster care effects (maltreatment, removal from family, multiple placements) rather than solely the latter. In a recent study of adolescents who were in the California foster care system at some point between grades 9 and 11 between 2002 and 2007, 52% attended schools in the bottom 30% of school performance compared to about 40% of the general population of students attending public schools in California (Frerer, Sosenko, & Henke, 2013). When educational outcomes were assessed in 2010, only 45% of youth in foster care completed a high school degree (diploma, GED, or certificate) compared to 79% of all youth attending California public schools. However, when youth in foster care were compared to a sample of students matched

along several factors (e.g., grade level, school year, race/ethnicity, English language learner status, reduced-price lunch status, disability status, district or school performance rank, and academic achievement) with no foster care involvement, the 24-point gap closed to just 8 percentage points. Given that older youth in foster care are more likely to come from lower income backgrounds, improving educational performance among these students in part involves addressing widespread inequities endemic in the broader U.S. education system.

With regard to promoting college completion and not just college access, there are several factors at play that may bear down and/or interact on a youth's ability to finish a degree. Youth who have aged out of care are more likely to attend two-year and community colleges, which have lower completion rates than four-year colleges and universities. Data have not been collected on the quality of the postsecondary institutions that former youth in foster care attend, but school quality has been shown to have a significant effect on students' likelihood of completing their degree for the general population of college students and for first generation, underrepresented students. Research also shows that some older youth in care take longer to finish their secondary education and start college. These delays are important given the ticking hand of the foster care entitlements clock. Substantial forms of support from federal and state provisions end by the time students are 21, which is likely to occur in the middle of their college career before they have completed their degree (Okpych, 2012). Indeed, the most common reasons older youth in foster care report for dropping out of college are real-life obstacles, such as not having enough money to pay for school, the need to work, and childcare responsibilities (Courtney, Dworsky, et al., 2012; Courtney, Hook, & Lee, 2012). If college completion (not just attendance) is an earnest goal that policy seeks to address, more attention needs to be paid to the timeline of and barriers to degree completion among these youth.

A second caveat pertains to the interpretation of the regression analyses. Although the covariates were meant to control for a number of factors that could reasonably explain earnings and employment status other than youths' level of education, the results are not sufficient to make causal assertions about the treatment effect of education. Students that complete high school and attend college, for example, were not randomly assigned to certain education levels, and these groups likely vary along a number of attributes, proficiencies, preferences and choices, and histories they bring to the table and in the effect that different levels of education would have on their employment status and earnings. While there are certain statistical methods such as the use of an instrumental variable or propensity score matching that might adjust for some of these effects, an alternative analytic approach would be to examine educational trajectories of distinct subgroups of youth (e.g., see Courtney, Hook, & Lee, 2012, for classification of young adults formerly in foster care). This person-centered approach may provide a more realistic picture of different types of students as they move through their educational trajectories. In any case, more concentrated, rigorous research is needed to ensure that the inflow of resources from legislation and local initiatives will translate into actual gains in educational attainment.

References

Amemiya, T. (1984). Tobit models: A survey. Journal of Econometrics, 24(1-2), 3–61.
Barth, R. P. (1986). Emancipation services for adolescents in foster care. Social Work, 31(3), 165–171.
Baum, S., Ma, J., & Payea, K. (2010). Education pays, 2010: The benefits of higher education for individuals and society. Trends in higher education series. New York: College Board Advocacy & Policy Center.
Berktold, J., Geis, S., & Kaufman, P. (1998). Subsequent educational attainment of high school dropouts. Postsecondary education descriptive analysis reports. Statistical analysis report. Washington, DC: US Government Printing Office, Superintendent of Documents.
Boesel, D., Alsalam, N., & Smith, T. M. (1998). Research synthesis: Educational and labor market performance of GED recipients. Washington, DC: National Library of Education.
Boudett, K. P., Murnane, R. J., & Willett, J. B. (2000). Second-chance strategies for women who drop out of school. Monthly Labor Review, 123, 19.

Bureau of Labor Statistics, U.S. Department of Labor (2013). Earnings and unemployment rates by educational attainment. Retrieved February 21, 2014 from. http://www.bls.gov/emp/ep_chart_001.htm.
Cameron, S., & Heckman, J. (1993). The nonequivalence of high school equivalents. Journal of Labor Economics, 11(1), 1–41.
Carroll, J. M. (1990). The Copernican plan: Restructuring the American high school. Phi Delta Kappan, 71(5), 358–365.
Courtney, M. E. (2009). The difficult transition to adulthood for foster youth in the US: Implications for the state as corporate parents. Society for Research in Child Development, 23(1), 3–18.
Courtney, M. E., Dworsky, A., Brown, A., Carey, C., Love, C., & Vorhies, V. (2012). Midwest evaluation of adult functioning of former foster youth: Outcomes at age 26. Chicago: Chapin Hall Center for Children at the University of Chicago.
Courtney, M. E., Dworsky, A., Cusick, G. R., Havlicek, J., Perez, A., & Keller, T. (2007). Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 21. Chicago: Chapin Hall Center for Children at the University of Chicago.
Courtney, M. E., Dworsky, A., Lee, J. S., & Raap, M. (2010). Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 23 & 24. Chicago: Chapin Hall Center for Children at the University of Chicago.
Courtney, M. E., Dworsky, A., Ruth, G., Keller, T., Havlicek, J., & Bost, N. (2005). Midwest evaluation of adult functioning of former foster youth: Outcomes at age 19. Chicago: Chapin Hall Center for Children at the University of Chicago.
Courtney, M. E., Hook, J. L., & Lee, J. S. (2012). Distinct subgroups of former foster youth during young adulthood: Implications for policy and practice. Child Care in Practice, 18(4), 409–418.
Courtney, M. E., Terao, S., & Bost, N. (2004). Midwest evaluation of adult functioning of former foster youth: Conditions of youth preparing to leave state care. Chicago, IL: Chapin Hall Center for Children at the University of Chicago.
Day, A., Dworsky, A., Fogarty, K., & Damashek, A. (2011). An examination of post-secondary retention and graduation among youth in foster care enrolled in a four-year university. Children and Youth Services Review, 33(11), 2335–2341.
Dworsy, A. (2005). The economic self-sufficiency of Wisconsin's former foster youth. Children and Youth Services Review, 27(10), 1085–1118.
Eisinga, R., Grotenhuis, M. T., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? International Journal of Public Health, 58(4), 637–642.
Festinger, T. (1983). No one ever asked us: A postscript to foster care. New York: Columbia University Press.
Frerer, K., Sosenko, L. D., & Henke, R. R. (2013). At greater risk: California foster youth and the path from high school to college. San Francisco, CA: Stuart Foundation.
GED Testing Services (2014). Programs and services: FAQs: Standardization, norming, and passing standards. Retrieved February 21, 2014 from. http://www.gedtestingservice.com/educators/2014-faqs
Geen, R. (2009). The fostering connections to success and increasing adoptions act: Implementation issues and a look ahead at additional child welfare reforms. Washington, DC: Child Trends.
Goerge, R. M., Bilaver, L., Lee, B. J., Needell, B., Brookhart, A., & Jackman, W. (2002). Employment outcomes for youth aging out of foster care. Chicago, IL: Chapin Hall Center for Children.
Heckman, J. J., Humphries, J. E., & Mader, N. S. (2011). The GED. Handbook of the economics of education, 3, 423–483.
Heckman, J. J., & LaFontaine, P. (2006). Bias corrected estimates of GED returns. Journal of Labor Economics, 24(3), 661–700.
Hook, J. L., & Courtney, M. E. (2011). Employment outcomes of former foster youth as young adults: The importance of human, personal, and social capital. Children and Youth Services Review, 33(10), 1855–1865.
Hornby, H. C., & Collins, M. I. (1981). Teenagers in foster care: The forgotten majority. Children and Youth Services Review, 3(1), 7–20.
Hout, M. (2012). Social and economic returns to college education in the United States. Annual Review of Sociology, 38, 379–400.
Keller, T. E., Salazar, A.M., & Courtney, M. E. (2010). Prevalence and timing of diagnosable mental health, alcohol, and substance use problems among older adolescents in the child welfare system. Children and Youth Services Review, 32(4), 626–634.
Kinsey, J. (1981). Determinants of credit card accounts: An application of Tobit analysis. Journal of Consumer Research, 8(2), 172–182.
Kraus, J. (1981). Foster children grown up: Parameters of care and adult delinquency. Children and Youth Services Review, 3(1), 99–114.
Macomber, J., Alamin, S.C., Duncan, D., McDaniel, M., Vericker, T., Pergamit, M., et al. (2008). Coming of age: Empirical outcomes for youth who age out of foster care in their middle twenties. Washington, D.C.: US Department of Health and Human Services.
McDonald, J. F., & Moffitt, R. A. (1980). The uses of Tobit analysis. The Review of Economics and Statistics, 62(2), 318–321.
McMillen, C., Auslander, W., Elze, D., White, T., & Thompson, R. (2003). Educational experiences and aspirations of older youth in foster care. Child Welfare, 82(4), 475–495.
Murnane, R. J., Willett, J. B., & Boudett, K. P. (1999). Do male dropouts benefit from obtaining a GED, postsecondary education, and training? Evaluation Review, 23, 475–503.
Murnane, R. J., Willett, J. B., & Tyler, J. H. (2000). Who benefits from obtaining a GED? Evidence from high school and beyond. The Review of Economics and Statistics, 82(1), 23–37.
Naccarato, T., Brophy, M., & Courtney, M. E. (2010). Employment outcomes of foster youth: The results from the Midwest Evaluation of the Adult Functioning of Foster Youth. Children and Youth Services Review, 32(4), 551–559.

Okpych, N. (2012). Policy framework supporting youth aging-out of foster care through college: Review and recommendations. *Children and Youth Services Review, 34*(7), 1390–1396.

Pecora, P. J. (2012). Maximizing educational achievement of youth in foster care and alumni: Factors associated with success. *Children and Youth Services Review, 34*(6), 1121–1129.

Salazar, A.M. (2013). The value of a college degree for foster care alumni: Comparisons with general population samples. *Social Work, 58*(2), 139–150.

Singer, A. (2006). *Assessing outcomes of youth transitioning from foster care.* Salt Lake City, UT: Department of Human Services.

Smithgall, C., Gladden, R. M., Howard, E., Goerge, R., & Courtney, M. (2004). *Educational experiences of children in out of home care.* Chicago: Chapin Hall Center for Children at the University of Chicago.

Taylor, P., Parker, K., Kochhar, R., Fry, R., Funk, C., Patten, E., et al. (2012). *Young, underemployed and optimistic: Coming of age, slowly, in a tough economy.* Washington, D.C.: Pew Research Center.

Tobin, J. (1958). Estimation of relationship for limited dependent variables. *Econometrica, 26,* 24–36.

Tyler, J. H. (2003). Economic benefits of the GED: Lessons from recent research. *Review of Educational Research, 73*(3), 369–403.

Tyler, J. H. (2004). Does the GED improve earnings? Estimates from a sample of both successful and unsuccessful GED candidates. *Industrial & Labor Relations Review, 57*(4), 579–598.

Tyler, J., & Lofstrom, M. (2010). Is the GED an effective route to postsecondary education for school dropouts? *Economics of Education Review, 29*(5), 813–825.

Tyler, J. H., Murnane, R. J., & Willet, J. B. (2000). Estimating the labor market signaling value of the GED. *Quarterly Journal of Economics, 115*(2), 431–468.

Urban Institute (2008). Coming of age: Employment outcomes for youth who age out of foster care through their middle twenties. Retrieved February 21, 2014 from. http://www.urban.org/UploadedPDF/1001174_employment_outcomes.pdf

Wilkinson, G. S. (1993). *The wide range achievement test.* Wilmington, DE: Wide Range, Inc.

World Health Organization (1998). *The composite international diagnostic interview (CIDI).* Geneva: Switzerland.

Zhang, J., Han, M. Y., & Patterson, M. B. (2009). *Young GED examinees and their performance on the GED tests. Research studies, 2009-1.* Washington, D.C.: GED Testing Service.

Zimmerman, R. B. (1982). Foster care in retrospect. *Tulane Studies in Social Welfare, 14,* 1–119.