

Foster Care History, Profiles of Adolescence, and Educational Attainment

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Abstract

We examine whether foster care history is associated with educational attainment in adulthood. Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), we group young Americans according to characteristics of their adolescent lives by using cluster analysis to create profiles of adolescence based on familial and other social risk and protective factors. Within these groups, we examine the effect of foster care history on the likelihood of post-secondary enrollment and degree completion. We find substantial diversity among those who have experience with the foster care system and show that foster history influences educational attainment in young adulthood in most profiles of adolescence. The statistical analysis (multinomial logistic regression) demonstrates nuances in the educational careers of young adults with a history of foster care experience. Our findings implicate a need for interventions that will assist those with histories in foster care in achieving their educational potential.

Introduction

High school completion and post-secondary enrollment are taken for granted by most K-12 students and their parents in the United States (Lippman et al. 2008; Pew Research Center 2011), but research points to significant educational disadvantages among youth with foster care experience (Johnson 2019; Kirk et al. 2011; Reilly 2003; Watt, Norton, and Jones 2013). Youth in foster care tend to have higher rates of dropout and lower rates of GED attainment (Blome 1997) or high school graduation (Reilly 2003). Only about 10% of youth with a history of foster care enroll in a four-year college, and a smaller percentage graduate (Geiger and Beltran 2017). While in college, youth with foster care experience do not perform as well in their first semester as other first-year students (Unrau, Font, and Rawls 2012), and time to graduation and overall graduation rates are worse for youth with foster care experience than for their first-generation, low-income peers (Day, Dworsky, and Feng 2013; Day et al. 2011). However, when statistically matched to peers on individual, familial and environmental characteristics, youth with foster care experience may not be significantly less likely to earn a high school diploma or attend college (Berzin 2008). Moreover, less is known about whether youth with foster care experience may capitalize on high educational aspirations and optimism about their future (Merdinger et al. 2005; Reilly 2003; Unrau, Font, and Rawls 2012) to catch up to their peers over time.

Educational attainment is a key component of the increasingly diverse transition to adulthood that is largely shaped by family support and adolescent experiences prior to high school completion (Setterson, Ottusch, and Schneider 2015). Numerous studies document the exposure of youth with foster care experience to adolescent risk factors for poor adult outcomes (e.g., weak family connections, child abuse, exposure to violence), some of which tend to be significantly less common in the general population (Lee and Berrick 2014; Turney and Wildeman 2017; Unrau, Font, and Rawls 2012). At the same time, youth with foster care experience may benefit from adolescent protective factors that decrease the chances of poor outcomes or offset the effects of risk factors, such as formal mentors and positive expectations for the future (Hokanson et al. 2020; Thompson, Greeson, and Brunsink 2016), along with programmatic efforts designed to help offset the adverse effects of these youths' risk exposure. Therefore, questions remain about the effect of foster care on the post-secondary educational attainment of young Americans when viewed within the context of risk and

protective factors that strongly influence the transition to adulthood and educational outcomes in particular.

In this study, we use nationally representative data to compare the educational attainment of young adults who have foster care experience to those who do not. We use a dataset with a longitudinal structure that allows us to follow respondents through the transition to adulthood and a sufficient sample of those with foster care experience to support cluster analysis and multinomial logistic regression models predicting an outcome with more than two possible categories. While other researchers have used earlier waves of the same dataset to study other outcomes of youth with foster care experience (e.g., Singer and Berzin 2015 uses Wave III data to study adult identity), Wave IV of the Add Health allows us to capture educational outcomes over an extended period, up until the respondents are 24 to 32 years old. This is important because of the “stuttered” experience with post-secondary education that has become increasingly common in the United States (Setters, Ottusch, and Schneider 2015). Furthermore, youth with foster care experience may experience particularly bumpy trajectories as they are likely to be on their own, which could make post-secondary enrollment and persistence more challenging. Also, much research on foster care and education focuses on children (e.g., Berger et al. 2015), adolescents (e.g., Sullivan, Jones, and Mathieson 2010), or individuals within the first few years of adulthood (e.g., Berzin 2008; Samuels and Price 2008; Singer and Berzin 2015), with less research attention to what happens throughout early adulthood.

Our analytic approach produces an apt comparison by examining the effect of foster care within distinct profiles of adolescence. These profiles capture the diversity of experiences that shape educational trajectories to consider the unique effects of foster status. Our analytic strategy differs from the more common approaches that look for a difference among youth with foster care experience (e.g., Font et al. 2018) or compared to a general population of peers (e.g., Singer and Berzin 2015), holding constant a long list of covariates. While a rich body of research in human services and related fields informs our understanding of the foster care experience, this work more commonly employs data collected on the population with foster care experience without using a comparison sample (e.g., Geenen and Powers 2007; Sullivan, Jones, and Mathieson 2010). Our holistic approach situates foster care experience among a host of risk factors that may further disadvantage young people or be offset by protective factors experienced in adolescence.

Literature Review

Foster Care as an Early Life Experience

Foster care is experienced by approximately 6% of children in the United States (Wildeman and Emanuel 2014). This experience is a unique type of family disruption that reflects extreme disadvantage because negative life circumstances lead up to foster care placement, and foster care experience is associated with a wide range of downstream consequences. Youth with foster care experience are a diverse population with a variety of experiences, such as number and types of placements, duration of placements, and age at entry into care (Dworsky 2018). Youth in foster care may have lived in group homes, been victims of child maltreatment, and experienced limited and/or inconsistent adult support (Annie E. Casey Foundation 2015; Bruska 2008; Lee and Berrick 2015). Youth with foster care experience also have high rates of behavioral and emotional disorders due to abuse, neglect, and disruptive multiple placement changes (Johnson 2019). Turney and Wildeman (2017) find that youth with foster care experience are more likely than their peers to have a range of adverse childhood experiences, such as exposure to violence; the finding holds even when they examine subgroups of youth, such as the most socioeconomically disadvantaged.

While youth with foster care experience may face risk factors during their adolescence, researchers note the importance of studying this group from an anti-deficit approach (Medlin and Jaeger 2021). This approach highlights the factors that lead youth with foster care experience to successful outcomes, such as college enrollment and completion. Medlin and Jaeger (2021) introduce the term foster kids capital and describe its elements as fortitude, self-reliance, compassion, optimism, and motivation.

Emerging Adulthood and Educational Attainment

Sustained scholarly attention highlights the phenomenon of “emerging adulthood” in U.S. society, where individuals aged 18-25 have some self-sufficiency but do not yet see themselves as full adults (Arnett 2000). This life course stage when individuals gradually progress toward adult milestones is arguably a privileged

status (Morton 2017). While this period of emerging adulthood may be the new normal for many young Americans, young people with foster care experience are more likely to identify themselves as fully adult and less likely to have experienced emerging adulthood (Singer and Berzin 2015). They may be facing issues such as poverty, homelessness, and early parenthood (Font, Cancian, and Berger 2019; Hedenstrom 2021), which are referred to as “precocious transitions” (Wickrama, Wickrama, and Baltimore 2010). Rather than focusing on identity formation, as is typical in emerging adulthood, youth with foster care experience may be more concerned with employment and financial stability (Bowen et al. 2021).

Emerging adulthood assumes a degree of involvement from parents or parental figures, and parental involvement during the transition to adulthood is particularly important for students considering college (Fingerman and Yahirun 2015). Lowe and Dotterer (2017) note that parent-child contact, parental support giving, and parental academic engagement are all components of parental involvement during the college transition. Skobba and colleagues (2021) highlight the important contributions that parents make of material resources and especially of time. Yet, youth with foster care experience are less likely to have lasting and high-quality instrumental support networks or family support (Gross, Stolzenberg, and Williams 2020; Kirk et al. 2011; Singer, Berzin, and Hokanson 2013), and they report a lack of supportive relationships as a barrier to high school graduation and college access (Day et al. 2012). Moreover, those who leave foster care by “aging out” when they turn 18 typically lack financial support from their families (Annie E. Casey Foundation 2015; Lee and Berrick 2014). Furthermore, placement changes and attending poorly performing schools during childhood may result in limited academic preparation for college (Dworsky 2018).

Thus, unique experiences of youth in foster care shape a non-normative transition to adulthood, with implications for educational attainment. Still, parental involvement varies across sociodemographic groups (e.g., Lareau 2003) so youth with foster care experience may not be uniquely disadvantaged compared to certain groups of peers, such as those growing up in relatively resource-poor circumstances. Additionally, there may be important differences within the population of youth with foster care experience.

Okpych and Courtney (2021) recently studied factors influencing college completion among individuals formerly in foster care. They compared the foster sample with a nationally representative sample of low-income, first-generation college goers on descriptive measures and found that the low-income, first-generation students were more likely to complete a degree within six years of college entry. However, their inferential analyses were limited to the foster sample only. Among this group, number of placements and time spent in congregate settings were not associated with degree completion, while hours worked per week after college entry, becoming a parent during college, and the number of economic hardships faced after college entry were significant predictors (Okpych and Courtney 2021).

Some research raises questions about whether foster care experience rather than early life disadvantage, in general, portends negative educational outcomes. Berzin (2008) analyzes data from the National Longitudinal Survey of Youth 1997 (NLSY97) using propensity score matching techniques that mimic experimental research where “cases” (foster alumni) are compared to a “control” group (similar non-foster youth); she looks at this comparison across a variety of transition to adulthood outcomes, including completion of a high school diploma and college enrollment by ages 20-24. The study finds that foster youth are not significantly different than their matched peers, though both groups are vulnerable to negative outcomes. Those results suggest that the disadvantage in the earliest period of young adulthood is due to characteristics of the youth, their families, and communities. In contrast to Berzin’s findings, Hobbs and colleagues (2021) use propensity score matching to compare outcomes between youth in foster care and low-income at-risk youth who had not experienced care. They find that the youth in foster care had attained a significantly lower level of education by age 17 than the youth who had not experienced care.

Thus, while youth with foster care experience face non-normative early life circumstances, it is not clear whether these are unique enough to distinguish them as a whole from those who share similar early life familial and social risk factors for poor educational attainment. Moreover, within the subpopulation of youth with foster care experience, there may be considerable diversity in familial and other social exposures. Indeed, despite evidence of some experiences unique to youth in foster care, these youth may overlap considerably with non-foster peers in profiles of adolescent exposure to risk and protective factors. Therefore, our research

question is: *to what extent is educational attainment in early adulthood shaped by the distinctiveness of foster care experience rather than by familial and other social risk and protective factors?*

Data and Methods

We use Waves I, III, and IV of the restricted-use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), which was designed and is directed by researchers at the University of North Carolina at Chapel Hill (Harris et al. 2019). Add Health is a nationally representative dataset of students in grades 7-12 in 1994-95 (Wave I) with follow-ups through 2008, when the respondents were 24-32 years old (Wave IV). Add Health includes prospective and retrospective measurement of a wide range of risk and protective factors experienced in adolescence and detailed measurements of educational attainment. The Add Health sample has been employed as a comparison for a large, regional data collection effort targeting foster youth (The Midwest Study; Dworsky and Courtney 2010) and has been used as a general population comparison group in supplementary analyses for studies lacking a national sample (e.g., Perry 2006).

Wave I data provide detailed information about adolescent experiences, and these are supplemented by retrospective data collection in Wave III that asks about childhood/adolescence. Wave IV allows us to examine educational attainment through early adulthood. Wave IV reinterviewed 15,701 of the original Wave I respondents. Because key study variables are drawn from each of these three waves, our base sample participated in all three. Approximately 362 respondents reported having a foster care history, 204 of whom have complete data on the risk and protective factors used in cluster analysis to create profiles of adolescence. The remainder of our base sample makes a possible reference group against which to compare those with foster care experience. Because our goal is to compare foster alumni and peers who are the most similar in early life experiences, we cluster the base sample into profiles of adolescence, using measures of family and social risk and protective factors and the procedures described below.

Measures

Educational attainment, our dependent variable, is based on the Wave IV survey questions: “What is the highest level of education that you have achieved to date?” and “What is the most recent degree you have received?” We combine categories with low frequencies to measure it as follows: No post-secondary education (PSE) includes those who are high school graduates or less; Some PSE includes those with some post-secondary education but no Associate’s or higher degree; Post-secondary degree is the reference group and includes those with an Associate’s degree or higher.

Foster care experience, our focal independent variable, is measured using information from Wave III. When respondents were 18-26 years old, they were asked, “Did you ever live in a foster home?” This captures all foster care experience since Add Health respondents were too old to qualify for foster care after this wave of data collection. The dichotomous variable is coded 1 if the respondent reported having a history with foster care and 0 for those with no foster care experience. The Add Health asked a few follow-up questions to those reporting foster care experience. These questions provide some supplemental information on foster care placements for the subsample of foster alumni but are not applicable when comparing foster and their non-foster counterparts. Therefore, this information is presented in Appendix A for comparisons from national administrative data on foster youth, where available.

Risk and protective factors are taken from Wave I with some retrospective measures that go back further or span childhood (0-18). We draw on a variety of risk and protective factors across multiple domains that are associated with young adult status attainment outcomes (see, for example, Fomby and Bosick 2013; Hossler, Schmit, and Vesper 1999; Sandefur, Meyer, and Campbell 2006). Rather than focusing on individual level characteristics, we focus on the social contexts that generate risks and protective factors, with emphasis on the family domain. We also include other social exposures that may offset family circumstances and that may be experienced by adolescents without foster care experience.

We measure family-related risk and protective factors with six variables: family income, parents’ education, parental expectations for their child’s education, number of family changes, family connectedness, and childhood maltreatment.

Family income is measured in thousands of dollars, and derived from a Wave I survey question asking parents: About how much total income, before taxes did your family receive in 1994? Include your own income, the income of everyone else in your household, and income from welfare benefits, dividends, and all other sources. Parents' education represents the average number of years completed by the resident parents; if only one resident parent, then it is that parent's highest grade completed by Wave I (range=0-16 years of schooling).

Adolescents were asked in Wave I about how much their parents would be disappointed if they did not go to college. We take the average of responses about the resident mother and father, unless there is only one resident parent: *On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would s/he [resident mother/father] be if you did not graduate from college?*

Number of family changes is a variable created using constructed Wave I family structure variables (Harris 1999). This variable represents the sum of the number of times the family structure changed when compared to the prior year between ages 0-18.

Family connectedness is measured with an additive scale based on responses to four questions ranging from 1=not at all to 5=very much: *How much do you feel that people in your family understand you? How much do you feel that you and your family have fun together? How much do you feel that your family pays attention to you? How much do you feel that you want to leave home [reverse coded]?* All of these questions were asked at Wave I, and the scale ranges from 4-20.

Childhood Maltreatment is based on retrospective questions asked at Wave IV. We constructed an additive scale that ranges from 0-15 based on 3 questions coded 0=never, 1=one time, 2=two times, 3=three-5 times, 4=6-10 times, 5=more than 10 times: *Before your 18th birthday, how often did a parent or other adult caregiver (1) say things that really hurt your feelings or made you feel like you were not wanted or loved; (2) hit you with a fist, kick you, or throw you down on the floor, into a wall, or down stairs; (3) touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations.*

As protective and risk factors that may offset family circumstances, we include violent victimization as a risk factor that captures salient adolescent experiences and three additional protective factors—social support, years of mentorship, school connectedness.

Violent victimization, ranging from 0-8, is an additive scale based on 4 variables coded 0=never, 1=once, 2=more than once. At Wave I, respondents were asked about how often: *Someone pulled a knife or gun on you; Someone shot you; Someone cut or stabbed you; You were jumped.*

Social Support, measured at Wave I, is an additive scale that ranges from 4-20 based on 4 variables coded 1=Not at all to 5=very much. Respondents were asked how much they feel that (1) adults, (2) teachers, (3) parents, and (4) friends care about them.

Years of mentorship was taken from the Wave III survey when respondents were asked: Other than your parents or stepparents, has an adult made an important positive difference in your life at any time since you were 14 years old? Those who reported a mentor were asked: For how many years was [has] [mentor] been important in your life? This variable ranges from 0-27.

School connectedness comes from Wave I (range=5-25) and is an additive scale based on 5 variables coded from 1=strongly disagree to 5=strongly agree: (1) *you felt close to people at your school;* (2) *you felt like you were a part of your school;* (3) *you were happy to be at your school;*(4) *the teachers at your school treated students fairly;* (5) *you felt safe in your school.*

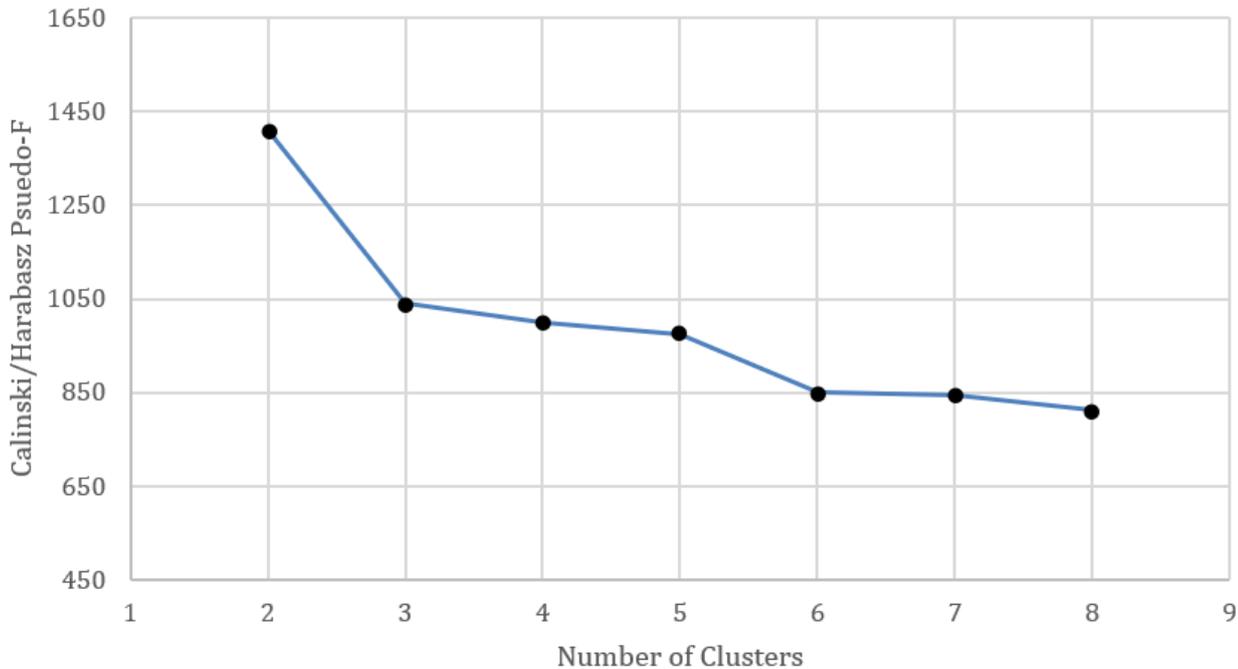
Multivariate regression models control for common demographic variables. Age is measured in years at Wave IV and centered on age 18. We include a dichotomous measure of gender (male=1, female=0). Race/ethnicity is coded to combine those who are minorities (i.e., underrepresented) in higher educational institutions—Black, Hispanic/Latino, Native American, and others—compared to those who tend to be educa-

tionally advantaged--white and Asian Americans. We also include a measure of GPA based on adolescent self-report at Wave I (when the students were in grades 7 through 12).

Analysis

We conduct the analysis in two phases –cluster analysis and multinomial logistic regression. We conduct a cluster analysis using k-means clustering on standardized measures (z-scores) of the ten risk and protective factors described above. K-means clustering is an iterative, non-hierarchical method for grouping respondents that has been used in a variety of studies using the Add Health data (e.g., Benson and Elder 2011; Lee 2014; Wang, Elder, and Spence 2012). Using the Calinski-Harabasz pseudo-F and the “elbow method” (see Figure 1) we chose a three-cluster solution for the data (Kodinariya and Makwana 2013).

Figure 1. Cluster Stopping Rule using “Elbow Test”



After generating three profiles of adolescence, we conducted t-tests of group differences to ensure that the groups were clearly distinct from one another and to see that each characterized a coherent set of adolescent circumstances (presented in Table 1). We then used multiple imputation for missing data (see Appendix B for details). Finally, we ran separate multinomial logistic regression models of educational attainment on foster care experience for each profile. Regression models control for age, gender, race/ethnicity, and GPA. All analyses are conducted using STATA 14 using svy to adjust for survey design effects.

Results

Cluster Analysis and Descriptive Statistics

The cluster analysis aims to find common patterns among groups of youth based on adolescent experiences. We focus on risk and protective factors in the construction of profiles of adolescence that cluster similar youth. The three profiles classify adolescent experiences as: 1) *Most advantaged* (n=5,115), 2) *Disadvantaged* (n=3,306), and 3) *High risk* (n=660). The percentage of foster care alumni in each of the three profiles of adolescence range from 1.31% of the *most advantaged* to 4.54% of the *high risk*.

Table 1. Descriptive Statistics by Profiles of Adolescence, Add Health				
	F u l l Sample	Profile 1 (n=5,115) Most Advan- taged	Profile 2 (n=3,306) Disadvantaged	Profile 3 (n=660) High Risk
Educational Attainment, highest level				
% no PSE	24.32	16.54 ^{2,3}	25.83 ^{1,3}	35.45 ^{1,2}
% some PSE	35.70	30.43 ^{2,3}	39.17 ¹	44.09 ¹
% Associate's Degree or higher	39.98	53.03 ^{2,3}	35.00 ^{1,3}	20.45 ^{1,2}
Foster Care Experience				
% yes	2.25	1.31 ^{2,3} (n=67)	3.23 ^{1,3} (n=107)	4.54 ^{1,2} (n=30)
Adolescent Risk and Protective Factors				
Family income (range=0-999)				
mean (sd)	47.94 (52.74)	53.92 ^{2,3} (60.58)	40.10 ¹ (32.60)	40.88 ¹ (49.46)
Parents' education (range=0-16)				
mean (sd)	12.58 (2.15)	12.80 ^{2,3} (2.13)	12.24 ^{1,3} (2.12)	12.53 ^{1,2} (2.22)
Parents disappointed if no coll. (range=1-5)				
mean (sd)	4.01 (1.17)	4.27 ^{2,3} (1.00)	3.66 ¹ (1.29)	3.76 ¹ (1.33)
# of Family changes ages 0-18				
mean (sd)	.77 (1.13)	.47 ^{2,3} (.82)	1.18 ¹ (1.34)	1.08 ¹ (1.37)
Family connectedness (range=4-20)				
mean (sd)	15.06 (3.13)	16.65 ^{2,3} (2.25)	12.88 ^{1,3} (2.80)	13.57 ^{1,2} (3.24)
Childhood Maltreatment (range=0-15)				
mean (sd)	1.97 (2.79)	1.13 ^{2,3} (1.92)	3.09 ¹ (3.31)	2.83 ¹ (3.37)
Social Support (range=4-20)				
mean (sd)	17.03 (2.11)	18.07 ^{2,3} (1.41)	15.70 ¹ (3.66)	15.73 ¹ (2.34)
Years of mentorship (range=0-27)				
mean (sd)	5.87 (7.19)	6.46 ² (7.40)	4.96 ^{1,3} (6.78)	5.77 ² (7.08)
School connectedness (range=5-25)				
mean (sd)	18.56 (3.71)	20.32 ^{2,3} (2.67)	16.30 ¹ (3.57)	16.21 ¹ (3.97)
Violent victimization (range=0-8)				
mean (sd)	.33 (.84)	.10 ^{2,3} (.34)	.17 ^{1,3} (.37)	2.85 ^{1,2} (1.16)
Control Variables				

Age (Wave IV; centered at 18) mean (sd) range=6-16	10.27 (.46)	10.04 ^{2,3} (1.75)	10.53 ¹ (1.69)	10.67 ¹ (1.63)
Gender (Wave IV) % male	46.20	45.70 ^{2,3}	40.93 ^{1,3}	76.52 ^{1,2}
Race/Ethnicity (white+Asian=0, others=1) % higher education minority	36.20	33.87 ^{2,3}	37.21 ^{1,3}	49.23 ^{1,2}
GPA (range 1-4)	2.86 (.79)	2.99 ^{2,3} (.76)	2.71 ^{1,3} (.78)	2.47 ^{1,2} (.80)
^{1,2,3} Indicates significant difference (p<.05) from profile number.				

Table 1 shows descriptive statistics for the study variables first for the full sample and then by profile group. Superscripts are used to denote statistically significant group differences in the average of the variable. These results show that the three profiles are significantly different from one another across educational attainment, foster care experience, many of the risk and protective factors, sociodemographics, and GPA. Profile 1, the *most advantaged*, is significantly different from the other two profiles on all study variables except years of mentorship, on which they are not significantly different from Profile 3, *high risk* adolescents. Despite being well-mentored, the *high risk* profile includes the largest proportion of those with foster care experience, males and higher education minorities; they have been victimized by violence more and earned low GPAs. Still, the *high risk* profile has higher average parental education and family connectedness than the *disadvantaged* profile (parental education =12.53 years compared to 12.24 years, respectively; family connectedness =12.88 vs 13.57 respectively; p<.05). The *high risk* profile was significantly less likely to pursue post-secondary education or get a college degree relative to having no post-secondary education (results not shown).

Figure 2 shows the breakdown of the foster and non-foster samples in profiles of adolescence. About one-third of the foster sample was *most advantaged* in adolescence, compared to more than half of the non-foster sample. Profile 2, *disadvantaged*, includes 53% of the foster sample and 36% of non-foster youth. Finally, the *high risk* profile includes the smallest percentage of foster alumni and those with no foster care experience, 15% and 7%, respectively. This distribution of foster youth across profiles aligns with expectations based on the literature showing that foster youth tend to come from less advantaged segments of society (Annie E. Casey Foundation 2015). Notably, however, those with foster care experience are also represented among the *most advantaged*, highlighting the heterogeneity (i.e., diversity) of the foster youth population.

Figure 2. Distribution of Foster and Non-Foster Youth by Profiles of Adolescence

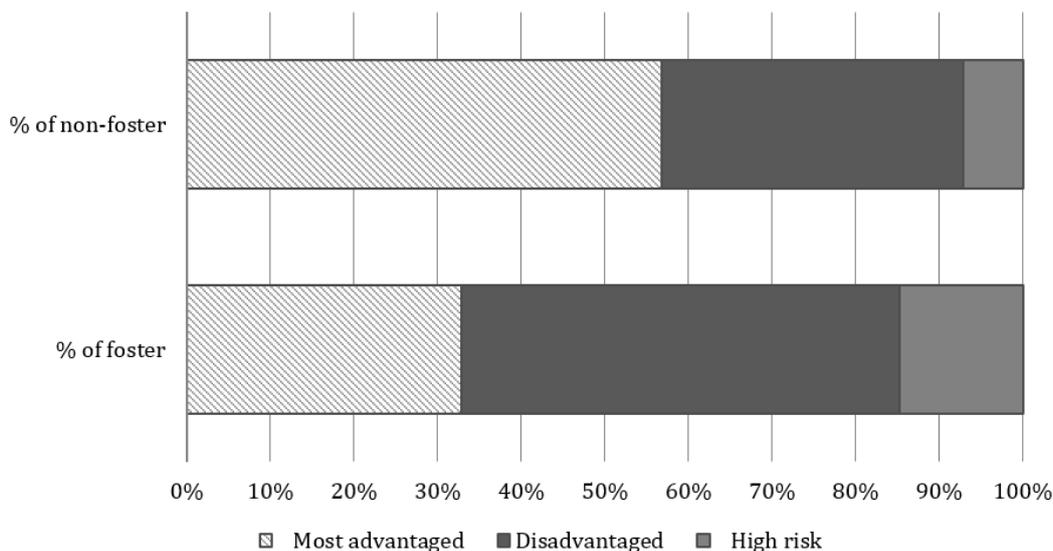
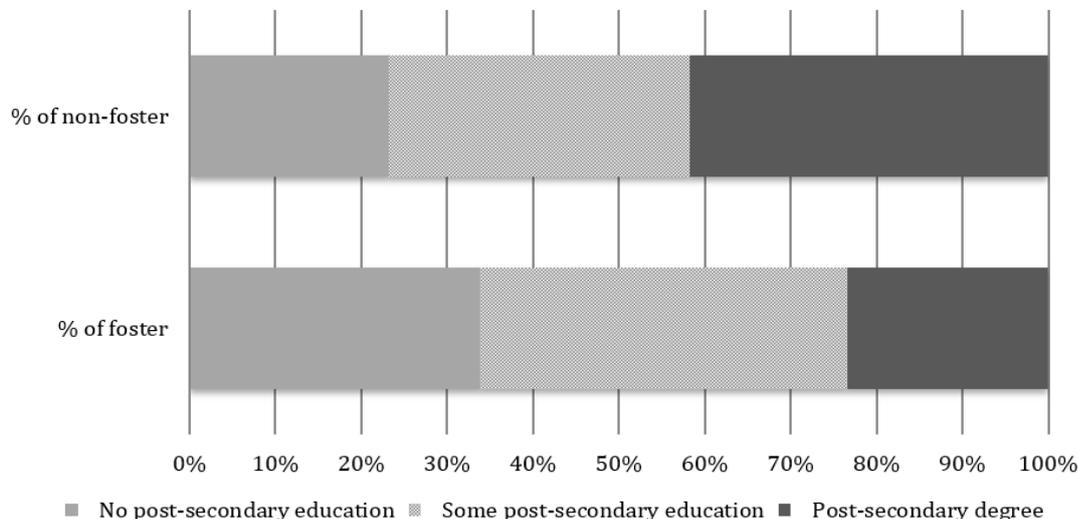


Figure 3 shows our dependent variable, educational attainment, among the foster alumni and non-foster samples. The foster sample includes a higher proportion of those with no post-secondary education and a lower proportion of those with a post-secondary degree compared to the non-foster group. Despite lower degree attainment, about 43 percent of foster care alumni have some post-secondary education (but no degree). This is roughly comparable to the percent of non-foster young adults who earned an Associate's degree or higher.

Figure 3. Distribution of Foster and Non-Foster Sample by Educational Attainment



Multinomial Logistic Regression

Table 2 shows the coefficients and standard errors from multinomial logistic regression models that were run for each profile separately. The reference category on the dependent variable is no post-secondary education (PSE) against which some PSE and College Degree are compared. Negative (and statistically significant) coefficients indicate a *lower* likelihood of some PSE or college degree attainment compared to no PSE, while positive coefficients indicate a *higher* likelihood of the educational outcome relative to the reference of no PSE. Young adults with a history of foster care experience were generally less likely to earn a college degree, although this finding was not statistically significant among the *high risk* profile of adolescence. Among those who were *most advantaged* in adolescence, former foster youth were more likely have some PSE education than none (coeff.=1.68, p<.01).

Table 2. Coefficients (SE) from Multinomial Logistic Regression of Educational Attainment within Profiles of Adolescence Controlling for Sociodemographics and GPA, Add Health

Profile	1: Most Advantaged		2: Disadvantaged			3: High Risk	
	Some PSE	College Degree	Some PSE	College Degree	De- gree	S o m e PSE	College De- gree
Foster Care Ex- perience	1.687** (.601)	-1.206 ^{tb} (.617)	-.019 (.298)	-1.836** (.574)		-.787 (.837)	-.390 (.975)
Control Vari- ables							
Race/Ethnicity	-.362* (.163)	-.753*** (.187)	.036 (.165)	-.180 (.574)		-.413 (.317)	-1.238*** (.366)

Age	-.010	.071	.001	.028	.031	-.211 [†]
	(.049)	(.058)	(.049)	(.056)	(.091)	(.117)
Gender (Male=1)	-.517***	-.616***	-.232	-.290 [†]	-.538	-.575
	(.133)	(.140)	(.159)	(.167)	(.333)	(.442)
GPA	.307**	1.020***	.275**	.815***	.258	.736*
	(.108)	(.133)	(.091)	(.723)	(.236)	(.291)
Model F test (equal FMI)	21.48		8.76		3.30	

***p<.001, **p<.01, *p<.05, †p<.10

^a Educational attainment: Reference group=No PSE=high school graduate or less; Some PSE=some post-secondary education without degree; College Degree=Associate's degree or higher

^bbivariate model p<.05

Among the control variables, adolescent grade point average (GPA) is the most consistently significant predictor of educational attainment. Members of race/ethnic groups who are underrepresented in colleges were significantly less likely to have pursued post-secondary education, particularly among the *most advantaged*, although statistically significant differences were not detected among the *disadvantaged* nor for some PSE compared to no PSE in the *high risk* profile. The *most advantaged* males are more likely than females to be in the lowest attainment category, no PSE.

Given the small sample size of former foster youth, we explored alternative contrasts in the regression analysis to examine different educational attainment comparisons. These results demonstrate some additional significant effects of foster care experience. Using a bivariate outcome comparing no PSE and any PSE, we find a significant, negative effect of foster care experience among the *disadvantaged* (coeff = -1.40, p<.01). That is, among those whose adolescent risk profile is characterized as *disadvantaged*, those with a history in foster care are less likely than their counterparts to have any post-secondary education. Finally, to elaborate on the marginally significant difference between having a college degree and no PSE for former foster youth who grew up *most advantaged* (shown in Table 2), our analyses show that those with foster care experience are less likely to earn a college degree compared to having some PSE with no degree (coeff=-1.79, p<.01).

Discussion

This study aimed to address the research question: *to what extent is educational attainment in early adulthood shaped by the distinctiveness of foster care experience rather than by familial and other social risk and protective factors?* Using nationally representative, longitudinal data that followed young Americans for more than a decade, we conducted cluster analysis to construct profiles of adolescence based on risk and protective factors derived from the family and other social exposures experienced in adolescence or throughout childhood. An examination of these profiles of adolescence shows the diversity of foster youth, a population frequently portrayed as overwhelmingly disadvantaged. Although there are higher percentages of foster youth in the *disadvantaged* and *high risk* profiles, they are also represented in the one characterized as *most advantaged*. Thus, we were able to examine the independent effect of foster care experience on educational attainment within diverse profiles of adolescence.

Our analysis of the *most advantaged* and *disadvantaged* profiles shows lower educational attainment for those who had foster care experience compared to their non-foster counterparts. This aligns with prior research suggesting an educational disparity for this subpopulation (Blome 1997; Day et al. 2011). Overall, these results point to nuances in how educational attainment differences play out for former foster youth relative to their non-foster counterparts. Berzin's (2008) work found that foster youth did not significantly differ

from matched peers in terms of high school graduation and college enrollment. Foster care alumni may be particularly resilient and able to capitalize upon their achievement orientation (Merding, Hines, Osterling, and Wyatt 2005; Unrau et al 2012) to *enroll in college*, but our results show that those with foster care experience are less likely to *complete a college degree* than their counterparts even with an extended follow-up period.

We did not find significant effects of foster care experience on educational attainment among those whose adolescent family and social contexts are characterized by *high risk*. The *high risk* profile of adolescence is the smallest profile (n=660 with 30 who had foster care experience) defining a particular demographic group. These are predominantly men, about half of whom are racial/ethnic minorities who have been victims of violence and have low school connectedness. Thus, despite being well-connected to their families and being mentored by other adults in youth, this group represents a subpopulation of young Americans who are less represented in higher education.

In this study, we were able to derive profiles of adolescence and examine the unique effects of foster status on educational attainment in early adulthood. Our ability to look further into adulthood –up to ages 24-32— may help to reduce some of the setbacks faced in the early years of establishing as an adult and considering post-secondary educational pursuits. However, the analysis does not permit a focus on youth who “age out” of foster care to begin the transition to adulthood suddenly disconnected from child welfare services. That subpopulation of foster alumni is likely to have a more difficult transition to adulthood for many reasons. Font and colleagues (2018) provide a detailed analysis with rich data from Wisconsin. They find that among those with foster care experience, those who “age out” of care as young adults tend to have better educational outcomes in young adulthood especially for those with more time in foster care. These within group differences highlight areas of important programmatic and policy interventions for youth in foster care. Still, recent estimates suggest that only about 8% of children in foster care are emancipated each year (aged out or emancipated as minors; Child Welfare Information Gateway 2021), leaving questions about how others with foster care history fare in young adult socioeconomic status attainment. Our analyses offer some answers to these questions in a nationally representative sample.

The findings of this study situate foster care experience among a host of familial and other social exposures that may differentiate young people and influence the transition to adulthood. Although foster youth may effectively overcome shorter term obstacles created by early life family disruptions, they are an extremely vulnerable group (Bruskas 2008) who are reliant on governmental policies and programs. Additional research on the population in foster care is warranted to best direct efforts aimed at offsetting the effects of this form of family disruption. Moreover, larger-scale programmatic and policy efforts to improve educational outcomes of young Americans would serve a larger segment of the population if they focused broadly on those experiencing a range of risks and disadvantages during adolescence.

Limitations and Directions for Future Research

Future research should examine different measures of educational engagement to investigate how foster youth may be derailed at specific points in the period of life referred to as emerging adulthood. This may shed light on if and how these youth differ from their peers in factors such as support for college applications or the know-how to persist in the college environment. Moreover, among those youth characterized by *high risk*, this study is unable to conclude whether former foster youth are not significantly differentiated in this profile because of overall lower educational attainment, or whether the lack of findings may be the results of small sample size. Future research efforts should seek to learn more about young people with this profile to better address efforts to improve their educational achievements.

This study is also limited because the Add Health data does not provide details on foster care placements that are common in studies with a foster care focus. This includes factors such as type of foster care placement (e.g., kinship or non-kin care) and the age of youth at the time of placements. Such factors are predictive of a variety of outcomes for foster youth and contribute further to the heterogeneity of foster care alumni. We are also precluded from situating foster care placements in time to address pre-placement characteristics (as did Berzin 2008) and emancipation related issues (e.g., Collins 2001; Courtney and Dworsky 2006). Still,

such variables are less appropriate for studies comparing foster alumni to their peers without foster care experience since these variables would not be measured for the latter group. Appendix A demonstrates that the foster care sample of the Add Health is consistent with national data on foster care experience (Annie E. Casey Foundation 2018; U.S. Department of Health and Human Services 2013, 2018). Moreover, the Add Health's school-based sampling frame should produce a less biased baseline sample than other nationally representative datasets that sampled from household units to the exclusion of children who were living in group quarters, like the NLSY97 used by Berzin (2008). Still, more data are needed to enable disaggregated analyses of former foster youth at a national level.

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This research was supported by a grant from the Conrad N. Hilton Foundation, administered through CUNY's Office of Research, Evaluation, and Program Support. We are thankful for the statistical advice of Christen Madsen of CUNY's Quantitative Research Consulting Center. We have no conflicts of interest to disclose.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

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Appendix A. Details of Foster Care Placements

	Add Health Foster Sample	National Foster Estimates
Duration of foster care		
% with less than 12 months	60.29	45 ^b
% with 12-23 months	13.23	28 ^b
% with 24 months or more	26.47	28 ^b
Mean number of months in foster care ^a	20.47	n/a
Median number of months in foster care ^a	11	13.9 ^b
Average number of Placements		
% with 1 placement	1.79	n/a
% with 2 or more placements	64.78	n/a
	33	35 ^c

^aThe Add Health survey question asked about foster and adoptive placements. For respondents who had both, this number does not reflect foster care experience exclusively.

^b2016 data (U.S. Department of Health and Human Services 2018)

Appendix B. Multiple imputation

Variable	Percent missing	Observations imputed	Unique values	Minimum	Maximum
Age (centered)	0	0	11	6	16
Gender	0	0	2	0	1
Race/Ethnicity	.87	136	2	0	1
GPA	34.27	5,380	19	1	4