

# Stopping Out and its Impact on College Graduation Among a Sample of Foster Care Alumni: A Joint Scale-Change Accelerated Failure Time Analysis

---

Angelique G. Day *University of Washington Seattle*

Richard J. Smith *Wayne State University*

Emiko A. Tajima *University of Washington Seattle*

**ABSTRACT** *Purpose:* This study examines whether former foster youth are more likely to stop out of a 4-year university than low-income, first-generation students who did not experience out-of-home care. *Method:* Data were from a stratified random sample of 803 students enrolled at a large, public 4-year university in the Midwest over a 10-year period, including 438 former wards of the court who were identified on the Federal Application for Student Aid and a comparison group of 365 low-income, first-generation college students who did not identify as court wards. We calculated a series of statistics, including univariate (i.e., means), bivariate (i.e., crosstabs), and multivariate (i.e., joint-scale accelerated failure time) analyses. *Results:* Findings indicate that foster youth are more likely to transfer to another college/university, stop out, experience stop outs earlier in their academic career, and are less likely to graduate than their low-income, first-generation peers. Foster youth also took longer to graduate than the comparison group. *Conclusion:* Although federal policies have increased college access for foster care youth, increasing college access does not always lead to degree attainment. Our findings underscore the need to amend financial aid and related policies to better align with the needs of former foster youth.

**KEYWORDS:** foster care youth (wards of the court); first-generation, low-income college students' college access and retention; stopping out vs. dropping out

doi: 10.1086/712892

**A**s student attrition in postsecondary education gains the attention of policy-makers and educational administrators nationwide, it is important to better understand the subpopulations of students who experience high attrition rates. In her foreword to Braxton and colleagues' *Higher Education Report*

(2011), series editor Adrianna Kezar described the institutional interest in maintaining student enrollment not only because of the need for tuition revenue, but as an obligation to “the development of human potential.” Higher education is widely considered to be key to employability, job security, and higher earnings in the United States (see Baum et al., 2013; U.S. Department of Education [USDOE], 2014a; Okpych & Courtney, 2014). Although national data show that undergraduate graduation rates have increased since the 1990s (USDOE, 2014b), only 59% of undergraduates who initially enroll at 4-year universities complete their degree within 6 years (USDOE, 2014b). To better address the problem of student attrition, it is critical to explore the higher education trajectory of students who experience significant attrition, especially those from underrepresented groups such as students with foster care histories. Youths and young adults who exit foster care and enroll in postsecondary education are a subgroup of nontraditional students who have been found to be particularly vulnerable to attrition (Day et al., 2011; Geiger & Beltran, 2017; Kinarsky, 2017; Okpych & Courtney, 2018). Nontraditional students include those who delay enrollment (i.e., begin college at or after the age of 24 years), those who enroll part time due to full-time employment, those caring for dependents, those who have a GED rather than a high school diploma, and students who have been defined as financially independent according to federal income tax criteria (USDOE, 1996). Of the 415,000 youths in foster care nationwide in 2014, 22,000 aged out of the system (U.S. Department of Health and Human Services [USDHHS], 2015). It is estimated that approximately 10% of foster care alumni (FCA) enroll in postsecondary education, but only 3%–5% graduate (Geiger & Beltran, 2017). Using data from the Midwest Evaluation, Courtney and colleagues (2009) reported that 6% of FCA had a college degree by age 23–24 compared to 33% in the general population. Furthermore, as Okpych and Courtney (2014) noted, whereas college attainment predicts increased employment and earnings in the general population, the benefits are even greater for FCA. They concluded, “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” (p. 27).

Attrition in postsecondary education takes several forms. Some students drop out of higher education institutions completely, some students end their enrollment at one institution and transfer to another, and others end their enrollment and reenroll after an extended period of absence. This latter phenomenon is known as *stopping out*, a term coined by the Carnegie Commission on Higher Education in 1980 (Levine, 2012). The distinction between students who drop out and students who stop out is relevant for providers of higher education, campus program staff, and policymakers who make decisions about higher education funding. Failure to distinguish between permanent withdrawal and a temporary stop out may lead to erroneous conclusions about students’ motivations and behaviors and the factors influencing attrition (Stratton et al., 2008). Distinguishing between permanent

withdrawal and a temporary stop out also is an opportunity to inform programming to support student retention, especially for underrepresented and nontraditional students such as FCA.

Of the subpopulations of nontraditional students, youths and young adults who were formerly in foster care remain relatively understudied (Geiger & Beltran, 2017; Kinarsky, 2017). This could be due to the fact that until the passage of the College Cost Reduction Act of 2007, foster youth could not be categorized as financially independent and thus eligible for the maximum financial aid package to support their postsecondary education (National Association of Student Financial Aid Administrators, 2007). Available evidence does suggest that FCA face unique barriers to higher education, more so than other nontraditional students (Day et al., 2011, 2013; Geiger & Beltran, 2017; Piel, 2018; Rios & Rocco, 2014). Of the 415,000 youths in foster care nationwide in 2014, 22,000 aged out of the system (USDHHS, 2015). The present study is specifically focused on the postsecondary educational attainment of FCA and better understanding the patterns in drop out and stop-out rates for this population.

## Literature Review

### Foster Care Alumni and Postsecondary Education Attainment

Youths who age out of the foster care system often experience barriers to educational achievement (Geiger & Beltran, 2017; Geiger et al., 2018; Okpych & Courtney, 2017; Rios & Rocco, 2014). Numerous studies have shown that youths who exit care are less likely than youths who were not in care to enroll in and attend college (Brandford & English, 2004; Courtney et al., 2011; Wolanon, 2005). The reasons for this are many. Individual-level factors such as exposure to trauma, neglect, or abuse can lead to developmental disorders, learning disabilities, or psychosocial functioning challenges (Berrick et al., 1998; Casey Family Programs, 2003; Geiger & Beltran, 2017; Harden, 2004; Okpych & Courtney, 2018). Okpych and Courtney (2018) found that among youths who exited care, those reporting a greater avoidant attachment style had lower rates of degree attainment in postsecondary education settings, controlling for demographic factors, child maltreatment and placement history, prior educational history, risk factors, and college type. In addition, frequent changes in home and school placements disrupt academic progress and negatively influence chances for postsecondary educational achievement (Pecora et al., 2005; Smithgall et al., 2004; Yu et al., 2002) and subsequent employment in a meaningful job (Leone & Weinberg, 2010). As a result of these many obstacles, youths who age out of the foster care system and enroll in postsecondary education institutions face unique barriers to degree attainment (Geiger & Beltran, 2017; Kinarsky, 2017; Piel, 2018).

Despite these challenges, studies have found that as many as one third of youths exiting foster care do eventually enroll in college (Courtney et al., 2005, 2009;

Dworksy & Perez, 2009). However, college enrollment is only the first step. Studies show that the college careers of FCA are often disrupted by financial difficulties, the need to secure part- or full-time employment, or by the lack of preparation for college expectations (Blome, 1997; Courtney et al., 2009; Geiger & Beltran, 2017; Merdinger et al., 2005). Financial difficulties and the subsequent need to work often require students to enroll in fewer credit hours, which slows the time to degree attainment (Ishitani, 2006). The lack of preparation during high school for college-level work has required many FCA to enroll in remedial education courses during their first year of college (Brock, 2010; Geiger & Beltran, 2017). An estimated 40% of FCA enrolled in college took at least one remedial course (Courtney et al., 2018), potentially increasing the time and expense of college. As enrollment in remedial education slows progress toward degree attainment, this can increase the odds of dropping out. A study conducted by Attewell and colleagues (2006) found that only 52% of students who enrolled in remedial education courses finished a bachelor's degree within 8 years compared to 78% of their peers who had not enrolled in remedial education courses.

In addition to these academic factors, race, gender, parental collegiate enrollment, and socioeconomic class have been found to predict college attrition (DeAngelo et al., 2011). For example, a national study of first-generation students (Ishitani, 2006) found that female students were 56% more likely to graduate than their male counterparts, and Black students were 58% less likely to graduate in their 4th year than their white counterparts. Another study reported that 82% of students whose parents had a history of collegiate enrollment graduated compared to 54% of those whose parents completed high school but not college and only 36% of those whose parents had less than a high school diploma (Choy, 2001). Certain populations of children of color are overrepresented in the U.S. foster care system (Harris et al., 2009; Hines et al., 2004) and may be especially at risk of not graduating from college. Geiger and Beltran (2017) found that studies of disparities based on race and ethnicity point to disparities in educational outcomes, particularly for African American and Native American FCA relative to white FCA. Literature focused on the higher education experiences of FCA of color is limited, but studies have documented disparities in education outcomes and factors that predict graduation. For example, Harris et al. (2009) found disparities in rates of high school graduation and household income for African American FCA relative to white FCA. Differences in predictors of high school graduation have been documented across Latinx, African American, and white FCA (Garcia et al., 2012), and disparities in college graduation rates have been found among Native American FCA compared with white youths exiting foster care (O'Brien et al., 2010). Studies have also pointed to differential higher education outcomes for FCA compared with other low-income students. Day et al. (2011) documented a significant gap in rates of college retention and graduation among youths who exited care compared to low-income, first-generation

peers. A study conducted by the U.S. Government Accountability Office (2016) found that 72% of FCA had no degree or certificate within 6 years of first entering college—a far greater percentage than for low-income students (57%) and the student population as a whole (49%).

Finally, unique to those who come from foster care is the lack of access to an informal support network and to the social capital needed to connect FCA to information and opportunities (Garcia et al., 2012; Geiger & Beltran, 2017; Harris et al., 2009; Skobba et al., 2018). A youth's social network is critical to being able to cope with adversity in various social settings, including schools, and is often harmed by the experience of being in care (Jones, 2014). Family, peer, and neighborhood supports are frequently disrupted when youths are removed from home (Collins et al., 2008, 2010). Garcia et al. (2012) studied outcomes among a sample of Latinx, African American, and white youths in care and found that placement instability predicted lower rates of high school graduation. In addition, numerous placement and school changes may make it more difficult for youths in foster care to develop new sources of social support in the postsecondary education settings (Pecora et al., 2005; Smithgall et al., 2004) as exposure to maltreatment, relationship instability, and avoidant attachment style can leave youths more emotionally guarded and reluctant turn to others for help when problems arise during their collegiate journeys (Hernandez & Naccarato, 2010; Okpych & Courtney, 2018).

### **Transfer Status and Postsecondary Student Achievement**

Transferring from one higher education institution to another can impact graduation rates. The National Student Clearinghouse conducted a study that compared students transferring into 4-year institutions from 2-year institutions to those who started at 4-year institutions and found that those who started at a 2-year college and subsequently transferred completed at a rate of 73.5%, whereas those who began their college journeys at a 4-year institution completed at a rate of 63% within 8 years of college initial entry (Shapiro et al., 2013). FCA are more likely to begin their college journeys at community colleges than their non-foster-care peers (U.S. Government Accountability Office, 2016), which may have a positive effect on their college completion. To date, however, no study has investigated the impact of transferring on college attainment among foster care youth.

### **Student Attrition: Stopping Out Versus Dropping Out**

The existing body of literature that addresses student attrition rates has been mainly concerned with students' permanent exit from higher education. Several theoretical models have emerged seeking to explain the causes of students' decisions to leave college, examining factors external to the institutional setting and considering influences such as student background and personal characteristics (Stratton et al., 2005). Such models and their measures of student attrition focus on the

end event: the student's withdrawal from a postsecondary institution. What such models do not capture, however, is whether or not the student returns to the institution after experiencing a period of absence.

Stratton et al. (2005) pointed out that there is substantially less literature— and virtually no theoretical discussion— separating student attrition by the disparate paths students may take after withdrawing from a school. However, more recent research is beginning to address the temporary versus permanent withdrawal issue by focusing specifically on students who stop out (e.g., Li, 2010; Stratton et al., 2008; Terriquez & Gurantz, 2014; Zurita, 2004). The limited literature points to different motivations and causes of students' decisions to stop out or to drop out. Studies conducted by Terriquez and Gurantz (2014) and Li (2010) found that student motivations for stopping out tended to be related to finances, whereas the motivations of students who dropped out without ever returning to continue their education were more often related to academic performance. Other researchers have found that first-generation college students are more likely to stop out and less likely to reenroll than students with a parent or older sibling who completed college (Hébert, 2018; Zurita, 2004). One reason that first-generation college students may stop out is a lack of access to college-educated family members who can provide guidance and/or mentoring during stressful times in the academic semester and who have personal experience similar to the student's (Zurita, 2004). These findings underscore the value of studying the distinct temporal paths of subpopulations of at-risk students in higher education to better inform student retention strategies. Research examining the higher education trajectories of FCA can help guide policies and programs designed to support the academic success of this underrepresented group.

### **Campus-Based College Support Programs Targeting Foster Care Alumni**

In recognition of the unique needs and challenges faced by FCA in postsecondary educational settings, student support programs have emerged across the United States to better recruit and retain FCA on college campuses (Emerson et al., 2012). Although these programs vary greatly in terms of the specific types of services offered, common support services include academic tutoring; social and emotional support; year-round housing; and university-specific, targeted financial aid (Dworsky & Perez, 2009). Although these programs help to recruit, prepare, and support FCA in higher education, few programs have published findings on their program outcomes, and additional research is needed to assess the efficacy and effectiveness of campus-based programs (Geiger & Beltran, 2017; Randolph & Thompson, 2017).

### **Federal and State Policies That Impact Foster Care Youth Retention Rates**

In recent decades, federal policies have attempted to increase access to college among youths in foster care. Created as part of the 1999 Foster Care Independence Act, the Chafee Foster Care Independence Program was amended in 2001 to include

the Education and Training Voucher (ETV) Program, the first federal program created specifically to address the postsecondary educational needs of FCA (Children's Defense Fund, 2000). States can use ETV funds to provide youths with foster care histories with up to \$5,000 annually for postsecondary training and education. Youths receiving ETV funds on their 21st birthday remain eligible until age 23 as long as they are making satisfactory progress toward completion of their degree or certificate program requirements (i.e., a cumulative GPA of 2.0 or higher and maintaining at least part-time enrollment status; Center for the Study of Social Policy, 2009; Okpych, 2012). More recently, the Fostering Connections to Success and Increasing Adoptions Act of 2008 expanded eligibility for the ETV program to youths who are at least 16 years old when they achieve permanency through adoption or subsidized guardianship (Center for the Study of Social Policy, 2009). The College Cost Reduction Act of 2009 also allows financial aid applicants who were in foster care when they were at least 13 years old to claim independent status even if they subsequently achieved permanency through adoption or legal guardianship (Fernandes, 2008). This means that the income of their adoptive parent(s) or legal guardian is not counted against youths when determining their eligibility for federal financial aid.

In addition to the federal programs aiming to increase access to higher education among youths in foster care, 22 states have implemented tuition waiver programs that allow FCA to attend 2- and 4-year colleges at no or significantly reduced cost (Hernandez et al., 2017). In their review of state tuition and fee waiver programs, Hernandez and colleagues (2017) reported that more than 3,000 FCA received tuition waivers in 2015, totaling over \$8 million. They also documented a range of eligibility requirements restricting use, including age and time restrictions. For example, most programs require that youths were in foster care on or after their 18th birthday, and many require that FCA be under 21 years of age at the time of application. In some states, FCA must have been in care for a certain amount of time (generally 6 months to 2 years at minimum). Time limits further restrict the use of tuition and fee waiver programs, with some states requiring waivers to be used in consecutive years of study (Hernandez et al., 2017). The impact of tuition waivers on increasing FCA college access and graduation is not yet clear, as many of these policies have only recently been implemented. Other states have special scholarships and grants for youths who are in foster care (Eilertson, 2002; Spigel, 2004); these state efforts are important given that exempting college students from having to pay tuition has been shown to increase retention rates (Nora et al., 2005).

### **Effects of Stopping Out on Financial Aid: Pell Grants**

The federal Pell Grant program is the largest means-tested financial aid resource available to undergraduate students in the U.S. (Bettinger, 2004). A major benefit of Pell Grants is that, unlike student loans, they are not intended to be repaid. Pell Grant eligibility is determined by financial need, but how much a student can receive depends

on a number of factors, including cost of attendance, estimated family contribution, and whether the student is enrolled in school full or part time. Currently, students can collect a maximum of up to \$6,345 per academic year for a baccalaureate degree (Federal Student Aid, 2020) if they are enrolled full time. A student may receive Pell Grants for a total of 12 full-time semesters or 6 academic years. Students who are enrolled part time are eligible for funding, but they may receive less money each academic year because they are enrolled for fewer credit hours. For example, if a student is eligible to receive \$5,000 in Pell Grant funding per academic year but only attends school half time, the student would receive only \$2,500 for that year because of their enrollment status. In addition, stopping out does not count against the Pell Grant timetable. Students who stop out are able to resume their Pell Grant funding once they reenroll in school provided they have not reached their lifetime limit (Federal Student Aid, 2020).

Considering the eligibility criteria for Pell Grants, virtually all FCA are eligible for at least some Pell Grant assistance. However, the restriction of Pell Grant awards to 12 semesters (Federal Student Aid, 2020) may affect the ability of students who stop out to rely on Pell Grant assistance through the completion of their degree. This is especially true for students who fluctuate between stopping out and part-time enrollment. Although Pell Grants may have a positive effect on student retention, the loss of that financial assistance resource may negatively affect students' decisions to continue pursuing a postsecondary education credential (Bettinger, 2004).

### **Present Study**

This study examines whether youths and young adults who were formerly in foster care are more likely to stop out of a 4-year postsecondary institution than low-income, first-generation students without foster care histories. This study is unique in that no other known research has addressed the phenomenon of stopping out among college-going FCA. Additionally, it is one of only a few studies using a comparison group of students with similar socioeconomic backgrounds (i.e., students who meet requirements for admission to TRIO programs [USDOE, 2015]). TRIO programs are the eight federally funded U.S. programs designed to increase access to higher education for economically disadvantaged students. By investigating the higher education trajectories of FCA and their experiences of stopping out, the present study addresses a gap in the literature. FCA in postsecondary education are an understudied group, not only because they are underrepresented in college settings, but also because their status as FCA is confidential information, and researchers do not have ready access to these students or to their data. By examining and controlling for stopping out among FCA, this study builds on research that has examined whether FCA were more likely to drop out of college than other low-income, first-generation students who did not come through the foster system (e.g., Day et al., 2011, 2013). It is important to examine temporal factors such as time to graduation



because increased time means increased expense and because of federal financial aid time limits. Increased costs and limitations on financial aid are especially challenging for nontraditional students such as FCA. The present study addressed the following research questions:

1. What is the average time to graduation for students by ward of the court (FCA) status who stop out versus those who remain continuously enrolled? We hypothesized that FCA would graduate at a slower pace than other first-generation, low-income students.
2. Are youths who have experienced foster care more likely to stop out during college than other low-income, first-generation students? We hypothesized that FCA would be more likely to experience a stop-out episode than other first-generation, low-income students.
3. Do students with foster care histories who stop out graduate at a lower rate than other first-generation, low-income students who also experience a stop-out episode? We hypothesized that the percent of foster care youth who experience a stop-out period and who eventually graduate would be lower than that of other first-generation, low-income students.
4. Is there a difference in time to graduation for FCA compared with other first-generation, low-income students (controlling for stop outs, GPA, transfer status, gender, and race)? We hypothesized that the time to graduation for FCA would be longer than for first-generation, low-income peers with no history of foster care.

### Method

This study used higher education administrative data collected and managed by the registrar, admissions, financial aid, and budget and planning offices of one large, public, 4-year university in Michigan to examine college retention and graduation rates of students who were enrolled between fall 2000 and summer 2009. Michigan does not offer a foster youth tuition waiver, and the study predates the university's implementation of a targeted campus-based support program for FCA and the state's passage of a policy that extended foster care placement eligibility from age 18 to age 21. Data were linked and deidentified before being given to our research team for analysis. Given that graduation within 6 years is considered "on time," we decided to track 10 years of data to ensure that there was ample time to observe students who may have stopped out of college but still graduated, albeit late.

### Sample

The final sample included 803 students after we removed 9 students for incomplete data (i.e., missing GPAs and inability to determine student's last term of enrollment).

This total included all 438 undergraduates who indicated on the Free Application for Federal Student Aid (FAFSA) that they were formerly wards of the court and enrolled in college during the study period. FAFSA former ward-of-the-court status is the best proxy that institutions of higher education have to identify FCA enrolled at their campuses. The state in which this study was conducted did not adopt the extension policy for FCA afforded by the Fostering Connections to Success Act until 2011, and as such, none of the FCA in our sample were wards of the court after high school graduation. This population of FCA may not reflect the foster care population of the state as a whole, as these students all had to qualify and be admitted into the specific university being observed.

The comparison group was comprised of a stratified random sample of 365 low-income, first-generation college students from the same university who did not identify themselves as former court wards on their FAFSA. They were selected from the total population of 6,202 undergraduate students who were verified by the university as eligible for federal TRIO programs, meaning that their parents had not earned college degrees and their family income was within 150% of federal poverty guidelines (USDOE, 2015). Because FCA birth families are disproportionately poor (Goerge et al., 2002), using these criteria increased the likelihood that the socioeconomic backgrounds of the two groups would be similar. We obtained complete administrative data on FCA at the university for summer 2009 and calculated the number of FCA by first year of enrollment. To get the final comparison group, we drew a stratified random sample of low-income, first-generation students from the complete set of administrative data to match the subsample size of the FCA group based on enrollment date. There was no overlap in the foster care and first-generation, low-income, TRIO-eligible samples. The final two student groups were combined for analysis (not analyzed as separate cohorts).

Because this study relied on secondary data analysis, the institutional review boards at Michigan State University and Wayne State University approved waivers of consent.

## Measures

### *Dependent Variables*

This study has two dependent variables: graduation, which is *terminal*, and continued enrollment, which is *recurring*. The dependent variable for the terminal event is a binary variable (1 = graduated from the institution during the time period; 0 = otherwise). The recurring event is also a binary variable (1 = the student was enrolled at institution in a given semester; 0 = otherwise). The time to the terminal event is known as *survival* time or *failure* time (Kleinbaum & Klein, 2005) even though the event of interest (i.e., graduation) is a desirable outcome. Some of the observations are *right censored*, defined as a type of missing data that is a result of not knowing

the ultimate disposition of the terminal event (e.g., graduation) because it happens after the observation period (Kleinbaum & Klein, 2005). Specifically, in the current study, if a student was enrolled in summer 2009 (when the data were extracted) but the student had not yet graduated, the observation would meet the definition of being right censored. Right-censored observations bias estimates of survival time downward. Survival analysis accounts for censoring in parameter estimates by assuming the censored observations occur at random (Selvin, 2008).

### *Independent Variables*

There are two main independent variables: “ward of the court” (FCA) status, a time-invariant covariate, and stop-out status, a dichotomous, time-varying covariate. We determined stop-out status based on whether a student was unenrolled (i.e., took a leave of absence) for at least one semester during any fall or spring term during their college trajectory. Other variables controlled for in the model were gender, race, and transfer status (invariant covariates) and grade point average (GPA; a time-varying covariate). We included these control variables in the models because they have been shown to be influential factors in previous education studies where college retention and graduation data were observed (Crisp et al., 2018).

### **Data Analysis**

Because we were interested in modeling time to an event, we used a family of methods called survival analysis to answer the four research questions. Specifically, we calculated a series of statistics using R, including univariate (i.e., means), bivariate (i.e., crosstabs), and multivariate (i.e., joint-scale accelerated failure time) analyses. To determine the average time to graduation for students by ward of the court (FCA) status who stop out versus those who remain continuously enrolled (Research Question 1), we calculated the means and confidence intervals (CIs) for time to graduation by using the exponential survival time probability distribution to adjust estimates and account for censored data (as outlined in Selvin, 2008). We needed to use this model because observations are right censored (i.e., not all students graduated during the study period). Specifically, the estimated mean survival time is calculated as  $\hat{u} = \sum t_i / d$ , where  $t_i$  are the observed survival times in semesters for the whole sample divided by  $d$ , the number of complete observations (i.e., only graduates). The estimated variance is  $\hat{u}^2 / d$ , the mean squared divided by  $d$ , the number of complete observations (i.e., only graduates). Because survival distributions are asymmetric, a log transformation is used when calculating confidence intervals (e.g., CI low =  $e^{\ln(\hat{u}) - 1.96 \sqrt{(1/d)}}$ ; CI high =  $e^{\ln(\hat{u}) + 1.96 \sqrt{(1/d)}}$ ). Other graduations happened after the study period, which is why the estimated mean time to graduate may be higher than the maximum observed time to graduation. Because of the asymmetric distribution of the log transformation, the estimate may fall outside of the confidence intervals, as noted in Selvin (2008).

To determine whether FCA were more likely to stop out during college than other low-income, first-generation students (Research Question 2), we used crosstabs and chi-square tests. To answer Research Questions 3 and 4—whether FCA who stop out graduate at a lower rate and whether there a difference in time to graduation for FCA compared with peers—we used descriptive statistics, estimated a series of multivariate survival and *accelerated failure time* (AFT) models, tested their assumptions, and used the best fitting model that did not violate assumptions. Survival models use regression to estimate the change in survival time for each unit change in an independent variable. We tested models for multicollinearity using variance inflation factors and used model fit statistics (i.e., Akaike information criterion [AIC]) to select a parsimonious model. Recall that we have a data structure that has both recurrent events and terminal events; specifically, the recurrent event is stopping out, and the terminal event is graduating from college. First, we estimated a class of survival models called proportional hazards model with a joint frailty (i.e., random effect) using *frailtypack* (Rondeau et al., 2012). We chose this model because it is designed for events that happen more than once (i.e., the event of stopping out can occur multiple times during the observation period). Secondly, this model uses the right censoring of graduation to inform estimates of stopping out in that a student who graduates can no longer stop out. This model has a proportional hazards assumption, which states that the hazard function for an independent variable (i.e., a factor that influences time to graduation) is a constant over time. We tested the assumption using Kaplan-Meier plots and plotting Schoenfeld residuals. However, our data do not meet the proportional hazards assumption. To relax the proportional hazards assumption, we estimated a set of AFT models that assume a parametric distribution for the survival times and that the relationship of the independent variables to the survival time is multiplicative (Kleinbaum & Klein, 2005). One advantage of AFT models is that the estimated parameter, the *acceleration factor*, has an intuitive interpretation. It is the amount of time a one-unit change in the independent variable “accelerates” or increases the time to graduation (i.e., survival time). Of particular interest in this study is how much being a ward of the court (FCA) increased time to graduation.

Specifically, we estimated a semiparametric joint scale-change regression model of recurrent events and terminal events using the *reReg* package in R (Chiou, 2015; Ghosh & Lin, 2003; Huang & Wang, 2004). This model provides both an AFT model to estimate hazards for the terminal event (i.e., graduation) as well as a marginal count data (i.e., Poisson) estimate of the rate of recurrent events (i.e., stopping out) by using a shared frailty parameter (i.e., a random effect parameter). In addition to relaxing the proportional hazards assumption of the survival to graduation, this joint scale-change model is also robust to violations of the Poisson assumption (i.e., mean is equal to variance) necessary to estimate the recurrent event portion of the model (Xu et al., 2017). As a robustness check, we compared the joint scale-change model to (a) an AFT model for stop outs only that ignored censoring estimated with a

general estimating equation autoregressive correlation structure using the *aftgee* package (Chiou et al., 2014); and (b) a robust lognormal accelerated failure time model for the graduation rates using the *survreg* command in the R *survival* package (Therneau & Grambsch, 2000).

### Findings

Table 1 depicts results of the sample descriptive analysis by enrollment status at the end of the observation period. Students who identified as court wards (FCA) were less likely to have graduated than those in the low-income, first-generation comparison group. Males and females were equally likely to have graduated. African American

**Table 1**  
*Student Enrollment Status at the End of Observation Period*

Variable	N	Graduated		Dropped Out		Currently Enrolled	
		n	%	n	%	n	%
<b>Ward-of-the-court status<sup>b</sup></b>							
Low-income, 1st generation	365	271	74.2	68	18.6	26	7.1
Former court ward	438	176	40.2	140	32.0	122	27.9
<b>Gender</b>							
Male	314	165	52.5	86	27.4	63	20.1
Female	489	282	57.7	122	24.9	85	17.4
<b>Race<sup>c, d</sup></b>							
White	361	231	64.0	74	20.5	56	15.5
African American	315	140	44.4	106	33.7	69	21.9
Other <sup>a</sup>	127	76	59.8	28	22.0	23	18.1
<b>Enrollment status</b>							
First time in college	378	281	74.3	72	19.0	25	6.6
Transfer	425	166	39.1	136	32.0	123	28.9
<b>Stop-out status</b>							
Stopped out at least once	289	57	19.7	203	70.2	29	10.0
Never stopped out	514	390	75.8	5	1.0	119	23.2
Total	803	447	55.6	208	25.9	148	18.4

Notes. Row percentages shown; cumulative GPA mean = 2.72, (SD = 0.86).

<sup>a</sup>Other includes students who identified themselves as American Indian, Latino, and/or Asian American.

<sup>b</sup>Statistically significant difference in graduation rate between former court wards and nonwards ( $p < .05$ ).

<sup>c</sup>Statistically significant difference in graduation rate between white students and African American students ( $p < .05$ ).

<sup>d</sup>Statistically significant difference in graduation rate between students of another race and African American students ( $p < .05$ ).

students were less likely to have graduated than white students and students who identified with another race. Transfer students were less likely to have graduated than first-time students. Separate crosstab analysis (not shown) revealed that FCA were much more likely to have transferred into the 4-year university from another college/university setting than their low-income, first-generation peers ( $X^2 = 156$ ,  $df = 1$ ,  $p < .01$ ).

### Research Question 1: Average Time to Graduation

FCA took longer to graduate than the low-income, first-generation comparison group. Specifically, the mean time to graduation was 13.5 semesters (95% CI [11.5, 15.9]; data not shown) for the former court wards (FCA) who never experienced a stop-out episode and 11 semesters (95% CI [9.74, 12.5]) for the comparison group. For FCA who experienced one or more stop-out episodes, the estimated mean time to graduation was 50.4 semesters (95% CI [34.6, 73.6]), and for the comparison group with at least one stop out, the average was 21.8 semesters (95% CI [15.2, 31.1]). The estimated average semesters to graduation for those with stop outs exceeds the observed semesters in the data set (20 semesters) because many of the students in the sample did not yet graduate by summer 2009 when data were extracted. The estimated mean is based on the assumption that censored and complete observations have similar times to graduation.

### Research Question 2: Likelihood of Stopping Out

Descriptive statistics for the sample by stop-out status at the end of the observation period are captured in Table 2. Of the total sample, 36% experienced at least one period of stopping out during their college trajectory. The range of stop-out experiences was 0–5, ( $M = 0.45$ ,  $SD = 0.7$ ), with 234 students (29%) experiencing one stop out and 55 students (6.8%) experiencing two or more stop-out episodes (data not shown). As hypothesized, FCA were significantly more likely to experience a stop-out episode ( $n = 190$ , 43.4%) than their non-foster-care, low-income, first-generation peers ( $n = 99$ , 27.1%). Males were slightly more likely to stop out than females, but these differences were not statistically significant. There were significant differences in stopping out by race, with African American students (46.7%) much more likely to experience one or more episodes of stopping out than their white counterparts (27.4%). We also observed differences in stopping out by transfer status. Students who transferred into the university from another institution were much more likely to stop out (42.6%) than those who were enrolled as first-time college students (28.6%).

### Research Question 3: Effect of Stopping Out on Graduation Rates

Although stopping out slows time to graduation, it does not mean that students will drop out of school permanently (see Table 2). In our sample, 50 (16.8%) FCA who experienced a stop-out episode successfully reenrolled and either graduated or were on track to graduate at the end of the observation period. Only 36 (12.1%) of the students in the comparison group who stopped out reenrolled and subsequently

**Table 2**  
*Student Stop-Out Status at End of the Observation Period*

Variable	N	Stopped Out at Least Once		Never Stopped Out	
		n	%	n	%
<b>Ward-of-the-court status<sup>b</sup></b>					
Low-income, 1st generation	365	99	27.1	266	72.9
Former court ward	438	190	43.4	248	56.6
<b>Gender</b>					
Male	314	122	38.9	192	61.1
Female	489	167	34.2	322	65.8
<b>Race<sup>c, d</sup></b>					
White	361	99	27.4	262	72.6
African American	315	147	46.7	168	53.3
Other <sup>a</sup>	127	43	33.9	84	66.1
<b>Enrollment status<sup>b</sup></b>					
First time in college	378	108	28.6	270	71.4
Transfer	425	181	42.6	244	57.4
<b>Graduation status: All<sup>b</sup></b>					
Graduated	447	57	12.8	390	87.2
Dropped out	208	203	97.6	5	2.4
Currently enrolled	148	29	19.6	119	80.4
<b>Graduation status: Former court ward<sup>b</sup></b>					
Graduated	176	27	15.3	149	84.7
Dropped out	140	140	100.0	0	0.0
Currently enrolled	122	23	18.9	99	81.1
Subtotal graduated + currently enrolled	298	50	16.8	248	83.2
<b>Graduation status: Low-income, 1st generation<sup>b</sup></b>					
Graduated	271	30	11.1	241	88.9
Dropped out	68	63	92.6	5	7.4
Currently enrolled	26	6	23.1	20	76.9
Subtotal graduated + currently enrolled	297	36	12.1	261	87.9
Total	803	289	36.0	514	64.0

Notes. Row percentages shown.

<sup>a</sup>Other includes students who identified themselves as American Indian, Latino, and/or Asian American.

<sup>b</sup>Chi-square test statistically significant ( $p < .001$ ).

<sup>c</sup>Statistically significant difference in stop-out rate between white students and African American students ( $p < .001$ ).

<sup>d</sup>Statistically significant difference in stop-out rate between students of another race and African American students ( $p < .001$ ).

graduated or were on track to graduate. That is, contrary to our hypothesis, the FCA in this sample reenrolled and either graduated or were on track to graduate after a period of stopping out at a slightly higher rate than their first-generation, low-income, non-foster-care peers ( $X^2 = 622$ ,  $df = 7$ ,  $p < .001$ ).

To further answer Question 3, we present a series of multivariate models (Tables 3 and 4). See Table 3 for the results from an accelerated failure time recurrent event regression that ignores censoring from graduation. This model is biased downward because it ignores the terminal event but is presented for illustrative purposes. As shown in Table 3, the time to stopping out for the ward of the court (FCA) group is shorter (changed by a factor of 0.82) than for other low-income, first-generation students. In our analysis, GPA had a significant interaction effect for FCA time to stopping out. For every 1-point increase in GPA above the mean, time to stop out for FCA is changed by an acceleration factor of 0.66 (i.e., decreases time to stop out). For students in the comparison group, GPA increased the time to stopping out by a factor of 2.33. Transfer students' time to stop out was changed by a factor of 0.58 compared to those who entered the university as first-time, first-year students. In other words, FCA stopped out sooner than other low-income, first-generation students, and transfer students stopped out sooner than students who entered the university as freshmen.

Since the model presented in Table 3 is biased downward because it ignores the terminal event (graduation), we also ran a joint scale-change model for time to stopping out that reduces bias by using graduation as *informative censoring*. As shown in Table 4, in the joint scale-change model, FCA had an accelerated time to stop out of 0.66 (i.e., stop out sooner) compared to other low-income, first-generation students, holding other variables constant. Transfer students had an accelerated time to stop

**Table 3**

*Estimate of the Acceleration Factor for Wards of the Court On Stop Outs Ignoring Graduations (N = 803)*

Coefficients	Acceleration				
	Factor	Estimate	SE	z-value	p-value
Intercept	19.81	2.99	0.07	42.31	.000
Ward of the court	0.82	-0.20	0.09	-2.29	.022
GPA (mean centered)	2.33	0.84	0.09	9.29	.000
Transfer	0.58	-0.54	0.08	-6.86	.000
Ward of the court * GPA (mean centered)	0.66	-0.42	0.12	-3.54	.000

*Note.* Results were estimated using the accelerated failure time generalized estimating equation (AFTGEE). Coefficients that are below 1.0 indicate a decreased time to the event, and coefficient estimates that are greater than 1.0 indicate increased time.



**Table 4**  
*Joint Scale-Change Model for Stop Outs Using Informative Censoring From Graduation (N = 803)*

Coefficients	Acceleration				
	Factors	Estimate	SE	z-value	p-value
<b>Stop-out rate</b>					
Ward of the court	0.66	0.041	0.15	2.73	.006
GPA	1.36	-0.31	0.15	-2.03	.043
Transfer	0.63	0.47	0.15	3.06	.002
Ward of the court * GPA	1.13	-0.12	0.18	-0.67	.505
<b>Hazard</b>					
Ward of the court	1.16	-0.15	0.18	-0.83	.407
GPA	0.70	0.35	0.25	1.42	.157
Transfer	0.82	0.20	0.22	0.91	.364
GroupWard of the court * GPA	1.11	-0.10	0.33	-0.31	.758

out factor 0.63 times that of students who entered as freshman, holding other variables constant. The relationship of GPA to stopping out is only significant for low-income, first-generation students who were not wards of the court. Each 1-point increase in GPA above the mean accelerated the time to stop out by 1.36. In running the joint scale-change model for stopping out, we also ran a joint scale-change model for time to graduation (Table 4). However, the multivariate lognormal regression model presented in Table 5 is the best model for time to graduation. In the joint scale-change model for graduation, the different groups have no significant differences in time to graduation.

**Table 5**  
*Lognormal Regression of Time to Graduation (N = 803)*

Value	Acceleration				
	Factor	Value	SE	z-value	p-value
Intercept	9.75	2.28	0.03	73.72	.000
Ward of the court	1.01	0.01	0.03	0.26	.793
GPA	0.89	-0.12	0.04	-3.16	.002
Transfer	0.89	-0.11	0.03	-4.08	.000
Female	1.04	0.04	0.03	1.70	.089
African American	1.18	0.17	0.03	5.72	.000
Other	1.05	0.05	0.04	1.31	.189
Times stopped out	1.19	0.17	0.03	6.68	.000
Ward of the court * GPA	0.91	-0.09	0.04	-2.20	.028
Scale	0.28	-1.28	0.03	-38.27	.000

#### Research Question 4: Effect of Stopping Out on Time to Graduation, Multivariate Models

See Table 5 for results from our lognormal regression model of time to graduation. In this analysis of “acceleration” time to graduation, increased acceleration represents a longer time, which is not a desired outcome. Each stop-out episode increased the time to graduation by a factor of 1.19. There was no difference in time to graduation for FCA versus other low-income, first-generation students. However, the change in time to graduation related to GPA was shortened by 0.91 for FCA and by 0.89 for other students. For transfer students, time to graduation was shortened by a factor of 0.89. African American students had an increased time to graduation of 1.18 compared to white students.

In this model—where we are controlling for stop outs, transfer status, GPA, gender, and race—time to graduation is similar for FCA and students in the low-income, first-generation comparison group. We had hypothesized that even controlling for these factors, FCA might take longer to graduate than the comparison students, but that was not the case. This suggests that stop outs, transfer status, GPA, gender, and race may represent the primary factors accounting for disparities in graduation rates when comparing FCA to other low-income, first-generation students. Although overall time to graduation did not vary by FCA status, stop outs increased time to graduation. We know from our analyses that FCA students have more stop outs than their low-income, first-generation peers and have them earlier in their academic career. Among FCA, GPA moderated the time to stopping out. Notably though, we found that increased GPA *reduced* the time to stopping out for this group. That is, academic success is not protective of stopping out; therefore, efforts by higher education institutions to help FCA stay in college and graduate need to look beyond academic factors.

See Figure S1 (online) for a plot of Kaplan-Meier curves by stop-out and ward of court status. The comparison group of low-income, first-generation students who did not stop out had the shortest time to graduation through most of the sample, followed by FCA students who did not stop out. Students who had at least one episode of stopping out had longer times to graduation, with FCA having longer times than their low-income, first-generation peers. The line for wards of the court (FCA) for those enrolled continuously crosses the line for wards of the court who had at least one stop out, which indicates that the effect varies over time. See Figure S2 (online) for a plot of the Kaplan-Meier curves by ward of the court and transfer status. In the comparison group, first-time college students took longer to graduate than transfer students; however, for wards of the court (FCA), transfer students took longer to graduate. In summary, FCA are more likely to stop out, time to graduation increases as the number of stop outs increases, and the effect of FCA status on time to graduation interacts with GPA.

### Discussion

The present study used bivariate and multivariate analyses, including survival analysis, to examine the higher educational trajectories of FCA and the impact of stopping out on graduation. Our models enabled us to fit a recurrent event (stopping out) with the dependent terminal event (graduation) and time varying regression coefficients (GPA, stopping out) using a joint scale-change model. An estimation of the dependencies between stopping out and graduation has implications for student support programs. The finding that time to graduation for FCA (13.5 semesters) is even longer than for low-income, first-generation students who did not experience foster care (11 semesters) is especially salient. Courtney et al. (2009) reported that among youth from the Midwest Evaluation, FCA graduated from college at approximately one sixth the rate of other students. This means that out of the 22,392 youths who aged out of foster care in 2014 (USDHHS, 2015), roughly one third (7,389) likely pursued a degree, but only 443 (6%) completed that degree within 6 years. That leaves many FCA still pursuing a postsecondary credential who may not have access to Pell Grant funding after the 6-year (12 semesters) lifetime limit. The 2011 decision by Congress to limit Pell Grant funding to 12 semesters of postsecondary enrollment (Federal Student Aid, 2020) is of grave concern for FCA enrolled in college. Prior literature and the present study document that even FCA who remain enrolled continuously take longer than 12 semesters to graduate. Thus, it is likely that this population of vulnerable students will not have sufficient access to this financial aid resource. Many factors influence the decision to stop out. The present study documents that stopping out significantly delays time to graduation for both FCA and their low-income, first-generation peers. It is critical to better align policies and education funding with the needs of FCA and other underrepresented groups.

There may be systemic reasons why FCA take longer to graduate from college than low-income, first-generation peers. Some of these reasons may stem from inadequate collaboration across the foster care and education systems (Geiger & Beltran, 2017). Foster care caseworkers could benefit from additional training so they are better able to advise FCA on the transition to higher education and be more mindful of the potential impact of multiple placement moves during a youth's precollege years (Skobba et al., 2018). As noted previously, FCA often come from low-performing high schools, and many need to enroll in remedial coursework before they can enroll in courses that count toward their postsecondary degree requirements (Courtney et al., 2018). Additionally, FCA may be less likely to have been exposed to precollegiate programs that assist students in discovering what their strengths and talents are, and in their path to self-discovery, students may change their majors during their collegiate journeys (Kirk & Day, 2011). Because changing one's major also slows time to graduation (Foraker, 2012; Tinto, 2012), it is important that campus-based student advisors be informed about the needs of FCA. A student's decision to stop out because

they are experiencing a difficult semester or because of the need to work increased hours to earn money could result in the student losing critical financial aid supports (i.e., ETV, Pell Grants) while they are in college. Previous studies have pointed to financial difficulties and the subsequent need to work as a major factor in decisions to stop out (Ishitani, 2006). Whereas reliable, sufficient federal and state support could promote college persistence and continued receipt of performance-based funding, insufficient support could set in motion a process that makes college persistence and academic achievement extremely difficult (Okpych, 2012). Congress should reconsider the current restrictions on the Education and Training Voucher and Pell Grant policies for FCA enrolled in college.

Findings from the present study underscore the adverse effect of stopping out on graduation for low-income, first-generation college students, and particularly for FCA. Precollegiate and campus-based programs for FCA should be aware of the impact of stopping out on the likelihood of graduation and counsel students about alternatives, help them to maintain enrollment wherever possible, and advise students about the time limits of grant funding. Our finding of disparity in stop-out rates among African American FCA compared with white FCA highlights the need for support programs to be culturally relevant as well. As Geiger and Beltran (2017) noted, youths of color who exit the foster care system and pursue higher education may find cultural connections, social support, and a feeling of belonging through their racial and ethnic identity. More research is needed to assess the efficacy and effectiveness of campus-based support programs for FCA, and information about promising practices needs to be disseminated (Randolph & Thompson, 2017).

Our findings have significant implications for research. Randolph and Thompson (2017) have called for the social work field to track consistent educational outcomes in longitudinal research. The present study illustrates the value in measuring stopping out in addition to graduation and dropping out. Measuring each of these outcomes will help to advance our understanding of and response to higher education trajectories, particularly among subgroups of students who are underrepresented in postsecondary settings. More research is needed on the higher education experiences of FCA. Understanding differences by subgroups, including racial and ethnic groups, is needed to inform practice in precollegiate and campus-based programming. Our study also points to the importance of tracking trends in college enrollment over longer periods. Our analysis spanned 10 years, which enabled us to better investigate patterns in stopping out and their relationship to graduation.

One of our most notable findings is that FCA who transfer into a university from another postsecondary school are at much greater risk for not graduating than low-income, first-generation peers. These findings are in contrast to findings reported by Shapiro et al. (2013). We observed that FCA are significantly more likely to enter a 4-year

university as a transfer student than students in the low-income, first-generation comparison group. Certainly, FCA are often required to attend a community college prior to entering a 4-year university due to inadequate preparation to enter a 4-year university immediately after high school graduation (Geiger & Beltran, 2017). This inadequate preparation stems from secondary school instability due to home instability, particularly when youths have experienced multiple placement moves (Ersing et al., 2009; Pecora et al., 2005), as well as overrepresentation at low-performing high schools, lower grades, lower scores on college entrance exams, and underrepresentation in college preparatory courses (Blome, 1997; Burley & Halpern, 2001; Sheehy et al., 2001). The high transfer rates of FCA could also be attributed to the fact that these students may not have successfully integrated into the social and academic culture of the previous institutions in which they enrolled, and FCA need social capital to successfully transition to college (Skobba et al., 2018).

Youths and young adults who exit foster care are also at higher risk for lasting mental health effects as a result of trauma stemming from maltreatment, separation from family, and other stressors associated with compromised college outcomes (Phillips et al., 2015). Finding meaningful social supports in postsecondary communities is critical for FCA (Jones, 2014), as they often do not have access to a stable, permanent informal support system that can follow and support them as they transfer from one institution to another. It is clear that FCA are in need of targeted, comprehensive wraparound student support services that begin at college entry and continue to support these students through college graduation (Geiger & Beltran, 2017). These supports include access to adequate financial aid that covers not only tuition and fees but also housing, food, books, and other related educational expenses, such as transportation. Supports should also include priority access to on-campus employment opportunities, mentors, and access to emergency resources that can be tapped to address unanticipated expenses that may come up along the journey (e.g., care for a sick child, computer repairs, car repairs, and parking tickets; Day et al., 2011; Dworsky & Perez, 2009; Geiger et al., 2016).

The current study also found that African American students are less likely to graduate than their white counterparts, a finding that has been documented in previous research (see DeAngelo et al., 2011; Garibaldi, 2014). Youth of color are overrepresented in the foster care system nationwide, with African American youth making up 30% of the nation's foster care population but only 15% of the general population as recently as 2009 (Farrow et al., 2011). FCA youth of color are especially at risk of stopping out, and ultimately, dropping out if their needs go unmet. Research conducted in historically Black colleges and universities has indicated that African American students are more likely to persist when they are able to develop positive relationships with faculty and become actively and deeply involved in the academic community (Kim & Conrad, 2006).

### Limitations

This study has several limitations. First, it was not possible to distinguish the specific status of students who selected “ward of the court” status on the FAFSA (i.e., legal orphans, those who have been in guardianship, adopted, and those placed in out-of-home care due to juvenile delinquency) from those who were in foster care and did not experience permanency. FCA who have had access to informal support systems (i.e., contact with adoptive parents or other biological relatives via legal guardianship) while enrolled in college are likely to have different needs than students who did not have access to these support networks (i.e., those who aged out of foster care without achieving any type of permanency). It is also not clear which students in the current study transferred from a 2-year college and which students transferred from another 4-year university. The college experiences and transfer plans for students who attended a 2-year college will be different than those who matriculated from high school directly to a 4-year university. Additionally, our data didn’t control for the academic preparation of students prior to college entry (i.e., high school GPA, high school academic ranking, SAT/ACT scores, enrollment in high school advanced placement courses). The FCA in this study may not have been as academically prepared for college as students in the comparison group, which may have contributed to the differences we observed in graduation rates. However, this is not something we had measures for. In addition, there is no information on the income or education of the parents of FCA, which would have bolstered the premise that FCA and comparison students had similar family backgrounds. However, this limitation may be remediated somewhat in that all FCA are eligible for Medicaid, and income guidelines for Medicaid are even more restrictive than the definition used for TRIO eligibility. This study also includes both first-time college students and transfer students, two groups that may demonstrate different characteristics when it comes to college preparation and motivation. In addition, this study did not control for the number of credits that students were able to transfer, which may have provided a clearer comparison between the two groups in terms of time to graduation. Finally, our analysis was limited to students who were enrolled in one public, 4-year university. Additional studies are needed to determine the generalizability of these findings to the experiences of students enrolled at other types of institutions of higher learning (e.g., 2-year colleges and private institutions). In our study, small sample sizes limited our ability to analyze findings by race and ethnicity. We compared white and African American students, as these were the largest racial or ethnic groups in our sample. The few students in our sample who identified as Latinx, Asian, or Native American were combined into the category of “other race/ethnicity” for analyses; their small number and the heterogeneity of the category is a notable limitation. Future research should aim for larger samples of Latinx, Native American, and Asian students to permit comparison between and within these groups.

## Conclusion

Living in the 21st century knowledge economy has necessitated the ability to pursue and complete a postsecondary credential. Federal policies (i.e., Education and Training Voucher, College Cost Reduction Act, Pell Grants) have increased college access for youths who have experienced foster care; however, increasing college access does not always lead to degree attainment. Our findings speak to the need to amend federal financial aid policies to better align with the educational trajectories and needs of FCA. Our data underscore the challenges faced by FCA as they pursue postsecondary education, even in comparison to other vulnerable groups such as other low-income, first-generation students. In addition to financial aid reforms, more campus-based resources are needed, including comprehensive wraparound student support services that not only target students in their first year but support FCA from college entry to graduation.

## Author Notes

**Angelique G. Day**, PhD, is an associate professor at the University of Washington Seattle School of Social Work.

**Richard Smith**, PhD, is an associate professor at the at Wayne State University School of Social Work.

**Emiko Tajima**, PhD, is an associate professor at the at the University of Washington Seattle School of Social Work.

Correspondence regarding this article should be directed to Angelique Day, 4101 15th Ave. NE, Seattle, WA 98105 or via e-mail to [dayangel@uw.edu](mailto:dayangel@uw.edu).

## Acknowledgments

The authors would like to acknowledge Laura Quist, MSW, and Megan Pennefather, MSW, for their assistance with the development of this manuscript.

## References

- Attewell, P., Lavin, D., Domina, T., & Levey, T. (2006). New evidence on college remediation. *Journal of Higher Education*, 77(5), 886–924. <https://doi.org/10.1080/00221546.2006.11778948>
- Baum, S., Ma, J., & Payea, K. (2013). *Education pays 2010: The benefits of higher education for individuals and society*. <http://trends.collegeboard.org/education-pays>
- Berrick, J. D., Needell, B., Barth, R. B., & Johnson-Reid, M. (1998). *The tender years: Toward developmentally sensitive child welfare services for very young children*. Oxford University Press.
- Bettinger, E. (2004). How financial aid affects persistence. In C. M. Hoxby (Ed.), *College choices: The economics of where to go, when to go, and how to pay for it* (pp. 207–238). University of Chicago Press. <http://www.nber.org/chapters/c10101.pdf>
- Blome, W. W. (1997). What happens to foster kids: Educational experiences of a random sample of foster youth and a matched group of non-foster youth. *Child and Adolescent Social Work Journal*, 14(1), 41–53. <https://doi.org/10.1023/A:1024592813809>
- Brandford, C., & English, D. (2004). *Foster Youth Transition to Independence Study*. Office of Children's Administration Research, Washington State Department of Social and Health Services. [https://www.dshs.wa.gov/sites/default/files/CA/pub/documents/FYTRpt\\_2.pdf](https://www.dshs.wa.gov/sites/default/files/CA/pub/documents/FYTRpt_2.pdf)

- Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2011). *Understanding and reducing college student departure: ASHE-ERIC higher education report, Volume 30, Number 3* (Vol. 16). John Wiley & Sons.
- Brock, T. (2010). Young adults and higher education: Barriers and breakthroughs to success. *The Future of Children*, 20(1), 109–132. <http://www.jstor.com/stable/27795062>
- Burley, M., & Halpern, M. (2001). *Educational attainment of foster youth: Achievement and graduation outcomes for children in state care*. Washington State Institute for Public Policy. <http://eric.ed.gov/?id=ED460220>
- Casey Family Programs. (2003). *Family, community, culture: Roots of permanency—A conceptual framework on permanency from Casey Family Programs*.
- Center for the Study of Social Policy. (2009). Youth in transition to adulthood. In *Policy matters: Setting and measuring benchmarks for state policies* (Discussion paper; pp. 88–95). <https://files.eric.ed.gov/fulltext/ED536839.pdf>
- Children's Defense Fund. (2000). *Frequently asked questions about the Foster Care Independence Act of 1999 and the John H. Chafee Foster Care Independence Program*. <https://www.childrensdefense.org/wp-content/uploads/2018/08/foster-care-independence-act-1999-frequently-asked-questions.pdf>
- Chiou, S. H. (2015). *reReg: Recurrent event regression* (Version 1.0-0) [R package]. <http://CRAN.R-project.org/package=reReg>
- Chiou, S. H., Kang, S., & Yan, J. (2014). Fitting accelerated failure time models in routine survival analysis with R package *aftgee*. *Journal of Statistical Software*, 61(11), 1–23. <http://www.jstatsoft.org/v61/i11/paper>
- Choy, S. P. (2001). *Students whose parents did not go to college: Postsecondary access, persistence, and attainment*. National Center for Education Statistics, U.S. Department of Education, Office of Educational Research and Improvement. <https://nces.ed.gov/pubs2001/2001126.pdf>
- Collins, M. E., Paris, R., & Ward, R. L. (2008). The permanence of family ties: Implications for youth transitioning from foster care. *American Journal of Orthopsychiatry*, 78(1), 54–62. <https://doi.org/10.1037/0002-9432.78.1.54>
- Collins, M. E., Spencer, R., & Ward, R. (2010). Supporting youth in the transition from foster care: Formal and informal connections. *Child Welfare*, 89(1), 125–143.
- Courtney, M., Okpych, N. J., Park, K., Harty, J., Feng, H., Torres-García, A., & Sayed, S. (2018). *Findings from the California Youth Transitions to Adulthood Study (CalYOUTH): Conditions of youth at age 21*. Chapin Hall at the University of Chicago. [https://www.chapinhall.org/wp-content/uploads/CY\\_YT\\_RE0518.pdf](https://www.chapinhall.org/wp-content/uploads/CY_YT_RE0518.pdf)
- Courtney, M. E., Dworsky, A., Brown, A. Cary, C. Love, K., & Vorhies, V. (2011). *Midwest Evaluation of the Adult Functioning of Former Foster Youth: Outcomes at age 26*. Chapin Hall at the University of Chicago. <https://www.chapinhall.org/wp-content/uploads/Midwest-Eval-Outcomes-at-Age-26.pdf>
- Courtney, M. E., Dworsky, A., Lee, J. S., & Raap, M. (2009). *Midwest Evaluation of the Adult Functioning of Former Foster Youth: Outcomes at ages 23 & 24*. Chapin Hall at the University of Chicago. [https://www.chapinhall.org/sites/default/files/Midwest\\_Study\\_Age\\_23\\_24.pdf](https://www.chapinhall.org/sites/default/files/Midwest_Study_Age_23_24.pdf)
- Courtney, M. E., Dworsky, A., Ruth, G., Keller, T., Havlicek, J., & Bost, N. (2005). *Midwest Evaluation of the Adult Functioning of Former Foster Youth: Outcomes at age 19*. Chapin Hall Center for Children at the University of Chicago. <https://www.chapinhall.org/research/at-age-19-youth-transitioning-out-of-foster-care-face-multiple-challenges/>
- Crisp, G., Doran, E., & Salis Reyes, N. A. (2018). Predicting graduation rates at 4-year broad access institutions using a Bayesian modeling approach. *Research in Higher Education*, 59, 133–155. <https://doi.org/10.1007/s11162-017-9459-x>



- Day, A., Dworsky, A., & Feng, W. (2013). A discrete time survival analysis of the relationship between foster care placement and the rate of graduation from a four-year university. *Journal of Research in Higher Education*, 19. <http://www.aabri.com/rhej.html>
- Day, A., Dworsky, A., Fogarty, K., & Damashek, A. (2011). An examination of retention and graduation among foster care youth enrolled in a four-year university. *Children and Youth Services Review*, 33(11), 2335–2341. <https://doi.org/10.1016/j.childyouth.2011.08.004>
- DeAngelo, L., Franke, R., Hurtado, S., Pryor, J. H., & Tran, S. (2011). *Completing college: Assessing graduation rates at four-year institutions*. Higher Education Research Institute, UCLA. [http://www.researchgate.net/publication/249644731\\_Completing\\_College\\_Assessing\\_Graduation\\_Rates\\_at\\_Four-Year\\_Institutions](http://www.researchgate.net/publication/249644731_Completing_College_Assessing_Graduation_Rates_at_Four-Year_Institutions)
- Dworsky, A., & Perez, A. (2009). *Helping former foster youth graduate from college: Campus support programs in California and Washington State*. Chapin Hall Center for Children. <https://www.issuelab.org/resources/3894/3894.pdf>
- Eilertson, C. (2002). *Independent living for foster youth*. National Conference of State Legislatures.
- Emerson, J., Duffield, B., Salazar, A., & Unrau, Y. (2012). The path to success: Creating campus support systems for foster and homeless students. *Leadership Exchange*, 10(2), 8–13.
- Ersing, R. L., Sutphen, R., & Loeffler, D. N. (2009). Exploring the impact and implications of residential mobility: From the neighborhood to the school. *Advances in Social Work*, 10(1), 1–18. <https://journals.iupui.edu/index.php/advancesinsocialwork/article/viewFile/77/204>
- Farrow, F., Notkin, S., Derezotes, D., and Miller, O. (2011). *Disparities and disproportionality in child welfare: Analysis of the research*. Center for the Study of Social Policy. [http://www.cssp.org/publications/child-welfare/alliance/Disparities-and-Disproportionality-in-Child-Welfare\\_An-Analysis-of-the-Research-December-2011.pdf](http://www.cssp.org/publications/child-welfare/alliance/Disparities-and-Disproportionality-in-Child-Welfare-An-Analysis-of-the-Research-December-2011.pdf)
- Federal Student Aid. (2020). *Federal student grant programs*. U.S. Department of Education. <https://studentaid.gov/understand-aid/types/grants/pell>
- Fernandes, A. L. (2008, May). *Youth transitioning from foster care: Background, federal programs, and issues for Congress*. Congressional Research Service, Library of Congress. <https://pdfs.semanticscholar.org/ebcfe77bf99e20a9632ac51b57b7bd2fa7b0bc93.pdf>
- Foraker, M. J. (2012). *Does changing majors really affect the time to graduate? The impact of changing majors on student retention, graduation, and time to graduate*. Office of Institutional Research, Western Kentucky University. [https://www.wku.edu/institres/documents/air\\_major\\_change.pdf](https://www.wku.edu/institres/documents/air_major_change.pdf)
- Garcia, A. R., Pecora, P. J., Harachi, T., & Aisenberg, E. (2012). Institutional predictors of developmental outcomes among racially diverse foster care alumni. *American Journal of Orthopsychiatry*, 82(4), 573–584. <https://doi.org/10.1111/j.1939-0025.2012.01181.x>
- Garibaldi, A. M. (2014). The expanding gender and racial gap in American higher education. *The Journal of Negro Education*, 83(3), 371–384. <https://doi.org/10.7709/jnegroeducation.83.3.0371>
- Geiger, J. M., & Beltran, S. J. (2017). Readiness, access, preparation, and support for foster care alumni in higher education: A review of the literature. *Journal of Public Child Welfare*, 11(4–5), 487–515. <https://doi.org/10.1080/15548732.2017.1354795>
- Geiger, J., Hanrahan, J., Cheung, J., & Leitz, C. (2016). Developing an on campus recruitment and retention program for foster care alumni. *Children and Youth Services Review*, 61, 271–280. <https://doi.org/10.1016/j.childyouth.2016.01.005>
- Geiger, J. M., Piel, M. H., Day, A., & Schelbe, L. (2018). A descriptive analysis of programs serving foster care alumni in higher education: Challenges and opportunities. *Children & Youth Services Review*, 85, 287–294. <https://doi.org/10.1016/j.childyouth.2018.01.001>
- Ghosh, D., & Lin, D. Y. (2003). Semiparametric analysis of recurrent events data in the presence of dependent censoring. *Biometrics*, 59(4), 877–885. <https://doi.org/10.1111/j.0006-341X.2003.00102.x>

- Goerge, R. M., Bilaver, L., Lee, B. J., Needell, B., Brookhart, A., & Jackman, W. (2002). *Employment outcomes for youth aging out of foster care*. Chapin Hall Center for Children, University of Chicago.
- Harden, B. J. (2004). Safety and stability for foster children: A developmental perspective. *The Future of Children*, 14(1), 31–47. <https://doi.org/10.2307/1602753>
- Harris, M. S., Jackson, L. J., O'Brien, K., Pecora, P. J. (2009). Disproportionality in education and employment outcomes of adult foster care alumni. *Children and Youth Services Review*, 31(11), 1150–1159. <https://doi.org/10.1016/j.chilyouth.2009.08.002>
- Hébert, T. P. (2018). An examination of high-achieving first-generation college students from low-income backgrounds. *Gifted Child Quarterly*, 62(1), 96–110. <https://doi.org/10.1177/0022016986217738051>
- Hernandez, L., Day, A., & Henson, M. (2017). Increasing college access and retention rates of foster youth: An analysis of the impact of 22 state tuition waiver programs. *Journal of Policy Practice*, 16(4), 397–414. <https://doi.org/10.1080/15588742.2017.1311819>
- Hernandez, L., & Naccarato, T. (2010). Scholarships and supports available to foster care alumni: A study of 12 programs across the U.S. *Children and Youth Services Review*, 32(5), 758–766. <https://doi.org/10.1016/j.chilyouth.2010.01.014>
- Hines, A., Lemon, K., Wyatt, P., Merdinger, J. (2004). Factors related to the disproportionate involvement of children of color in the child welfare system: A review and emerging themes. *Children and Youth Services Review*, 26(6), 507–527. <https://doi.org/10.1016/j.chilyouth.2004.01.007>
- Huang, C.-Y., & Wang, M.-C. (2004). Joint modeling and estimation for recurrent event processes and failure time data. *Journal of the American Statistical Association*, 99(468), 1153–1165. <https://doi.org/10.1198/016214504000001033>
- Ishitani, T. T. (2006). Studying attrition and degree completion behavior among first-generation college students in the United States. *The Journal of Higher Education*, 77(5), 861–885. <https://doi.org/10.1080/00221546.2006.11778947>
- Jones, L. P. (2014). The role of social support in the transition from foster care to emerging adulthood. *The Journal of Family Social Work*, 17(1), 81–96. <https://doi.org/10.1080/10522158.2013.865287>
- Kim, M. M., & Conrad, C. F. (2006). The impact of historically Black colleges and universities on the academic success of African American students. *Research in Higher Education*, 47(4), 399–427. <https://doi.org/10.1007/s11162-005-9001>
- Kinarsky, A. R. (2017). Fostering success: Understanding the experience of foster youth undergraduates. *Children & Youth Services Review*, 81, 220–228. <https://doi.org/10.1016/j.chilyouth.2017.08.016>
- Kirk, R., & Day, A. (2011). Increasing college access for youth aging out of foster care: Evaluation of a summer bridge program for foster youth transitioning from high school to college. *Children and Youth Services Review*, 33(7), 1173–1180. <https://doi.org/10.1016/j.chilyouth.2011.02.018>
- Kleinbaum, D. G., & Klein, M. (2005). *Survival analysis: A self-learning text*. Springer Science + Business Median.
- Leone, P., & Weinberg, L. (2010). *Addressing the unmet educational needs of children and youth in the juvenile justice and foster care systems*. Center for Juvenile Justice Reform, Georgetown University. <http://cjjr.georgetown.edu/pdfs/ed/edpaper.pdf>
- Levine, A. (2012). Clark Kerr and the Carnegie Commission and Council. In S. Rothblatt (Ed.), *Clark Kerr's world of higher education reaches the 21st century: Chapters in a special history* (pp. 43–60). Springer.
- Li, D. (2010). They need help: Transfer students from four-year to four-year institutions. *Review of Higher Education*, 33(2), 207–238. <https://doi.org/10.1353/rhe.0.0131>

- Merdinger, J. M., Hines, A. M., Osterling, K. L., & Wyatt, P. (2005). Pathways to college for former foster youth: Understanding factors contribute to educational success. *Child Welfare*, 84(6), 867–896. <http://search.proquest.com.proxy.lib.wayne.edu/docview/213809252?accountid=14925>
- National Association of Student Financial Aid Administrators. (2007). *Overview of the College Cost Reduction and Access Act*. [https://www.nasfaa.org/news-item/2379/Overview\\_of\\_the\\_College\\_Cost\\_Reduction\\_And\\_Access\\_Act\\_CCRAA](https://www.nasfaa.org/news-item/2379/Overview_of_the_College_Cost_Reduction_And_Access_Act_CCRAA)
- Nora, A., Barlow, L., & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college: The need for research. In A. Siedman (Ed.), *College student retention: Formula for student success*. Praeger Publishers.
- O'Brien, K., Pecora, P. J., Echohawk, L. A., Evans-Campbell, T., Palmanteer-Holder, N., & White, C. R. (2010). Educational and employment achievements of American Indian/Alaska Native alumni of foster care. *Families in Society*, 91(2), 149–157. <https://doi.org/10.1606/%2F1044-3894.3974>
- 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. <https://doi.org/10.1016/j.chilyouth.2012.02.013>
- Okpych, N., & Courtney, M. (2014). Does education pay for youth formerly in foster care? Comparison of employment outcomes with a national sample. *Children and Youth Services Review*, 43, 18–28. <https://doi.org/10.1016/j.chilyouth.2014.04.013>
- Okpych, N., & Courtney, M. (2017). Who goes to college? Social capital and other predictors of college enrollment for foster youth. *Journal of the Society for Social Work and Research*, 8(4), 563–593. <https://doi.org/10.1086/694897>
- Okpych, N., & Courtney, M. (2018). The role of avoidant attachment on college persistence and completion among youth in foster care. *Children and Youth Services Review*, 90, 106–117. <https://doi.org/10.1016/j.chilyouth.2018.05.014>
- Pecora, P. J., Kessler, R. C., Williams, J., O'Brien, K., Downs, A. C., English, D., White, J., Hiripi, E., White, C. R., Wiggins, T., & Holmes, K. (2005). *Improving family foster care: Findings from the Northwest Foster Care Alumni Study*. The Casey Family Programs.
- Phillips, L. A., Powers, L. E., Geenen, S., Schmidt, J., Wings-Yanez, N., McNeely, I., Merritt, L., Candis Williamson, C., Turner, S., Zweben, H., & Bodner, C. (2015). Better Futures: A validated model for increasing postsecondary preparation and participation of youth in foster care with mental health challenges. *Children and Youth Services Review*, 57, 50–59. <https://doi.org/10.1016/j.chilyouth.2015.07.010>
- Piel, M. (2018). Challenges in the transition to higher education for foster care youth. *New Directions for Community Colleges*, 2018(181), 21–28. <https://doi.org/10.1002/cc.20288>
- Randolph, K. A., & Thompson, H. (2017). A systematic review of interventions to improve post-secondary educational outcomes among foster care alumni. *Children and Youth Services Review*, 79, 602–611. <https://doi.org/10.1016/j.chilyouth.2017.07.013>
- Rios, S., & Rocco, T. (2014). From foster care to college: Barriers and supports on the road to postsecondary education. *Emerging Adulthood*, 2(3), 227–237. <https://doi.org/10.1177/2167696814526715>
- Rondeau, V., Mazroui, Y., & Gonzalez, J. R. (2012). Frailtypack: An R package for the analysis of correlated survival data with frailty models using penalized likelihood estimation or parametrical estimation. *Journal of Statistical Software*, 47(4), 1–28. <https://doi.org/10.18637/jss.v047.i04>
- Selvin, S. (2008). *Survival analysis for epidemiologic and medical research*. Cambridge University Press.

- Shapiro, D., Dundar, A., Ziskin, M., Chiang, Y., Chen, J., Torres, V., & Harrell, A. (2013). *Baccalaureate attainment: A national view of the post-secondary outcomes of students who transfer from two-year to four-year institutions* (Signature Report No. 5). National Student Clearinghouse Research Center.
- Sheehy, A., Oldham, E., Zanghi, M., Ansell, D., Correia, P., & Copeland, R. (2001). *Promising practices: Supporting transition of youth served by the foster care system*. Edmund S. Muskie School of Public Service, National Resource Center for Youth Services.
- Skobba, K., Meyers, D., & Tiller, L. (2018). Getting by and getting ahead: Social capital and transition to college among homeless and foster youth. *Children and Youth Services Review*, 94, 198–206. <https://doi.org/10.1016/j.childyouth.2018.10.003>
- Smithgall, C., Gladden, R. M., Howard, E., Goerge, R., & Courtney, M. (2004). *Educational experiences of children in out-of-home care*. Chapin Hall Center for Children at the University of Chicago. [https://www.chapinhall.org/sites/default/files/old\\_reports/156.pdf](https://www.chapinhall.org/sites/default/files/old_reports/156.pdf)
- Spigel, P. (2004). *Support for foster children's post-secondary education*. State of Connecticut General Assembly Office of Legislative Reports. <https://www.cga.ct.gov/2004/rpt/2004-R-0925.htm>
- Stratton, L. S., O'Toole, D. M., & Wetzel, J. N. (2005). Comparing first term and first year college attrition. *Virginia Economic Journal*, 10, 29–44.
- Stratton, L. S., O'Toole, D. M., & Wetzel, J. N. (2008). A multinomial logit model of college stop out and dropout behavior. *Economics of Education Review*, 27(3), 319–331. <https://doi.org/10.1016/j.econedurev.2007.04.003>
- Terriquez, V., & Gurantz, O. (2014). Financial challenges in emerging adulthood and students' decisions to stop out of college. *Emerging Adulthood*, 3(3), 204–214. <https://doi.org/10.1177/12167696814550684>
- Therneau, T. M., & Grambsch, P. M. (2000). *Modeling survival data: Extending the Cox model*. Springer Science & Business Media.
- Tinto, V. (2012). *Completing college: Rethinking institutional action*. University of Chicago Press.
- U.S. Department of Education (USDOE). (1996). *Non-traditional undergraduates: Trends in enrollment from 1986–2002 and persistence and attainment among 1989-90 beginning post-secondary students*. National Center for Education Statistics. <https://nces.ed.gov/pubs/web/97578.asp>
- U.S. Department of Education (USDOE). (2014a). *Baccalaureate and beyond: A first look at the employment experiences and lives of college graduates, 4 years on* (Report No. NCES 2014-141). National Center for Education Statistics. <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014141>
- U.S. Department of Education (USDOE). (2014b). *The condition of education 2014* (NCES 2014-083). National Center for Education Statistics. <http://nces.ed.gov/pubs2014/2014083.pdf>
- U.S. Department of Education (USDOE). (2015). *Federal TRIO programs*. <http://www2.ed.gov/about/offices/list/ope/trio/index.html>
- U. S. Department of Health and Human Services (USDHHS). (2015). *The AFCARS report: Preliminary estimates for FY 2014 as of October 2009*. Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. <http://www.acf.hhs.gov/sites/default/files/cb/afcarsreport22.pdf>
- U.S. Government Accountability Office. (2016). *Higher education: Actions needed to improve access to federal financial assistance for homeless and foster youth*. [www.gao.gov/assets/680/677325.pdf](http://www.gao.gov/assets/680/677325.pdf)
- Wolanon, T. (2005). *Higher education opportunities for foster youth: A primer for policymakers*. The Institute for Higher Education Policy.
- Xu, G., Chiou, S. H., Yan, J., Huang, C.-Y., & Wang, M.-C. (2017). Joint scale-change models for recurrent events and failure time. *Journal of the American Statistical Association*, 112(518), 794–805. <https://doi.org/10.1080/01621459.2016.1173557>

- Yu, E., Day, P., & Williams, M. (2002). *Improving educational outcomes for youth in care: A national collaboration*. Child Welfare League of America. <https://eric.ed.gov/?id=ED472191>
- Zurita, M. (2004). Stopping out and persisting: Experiences of Latino undergraduates. *Journal of College Student Retention*, 6(3), 301–324. <https://doi.org/10.2190/T3QL-V9RD-CMVB-6XQX>

Manuscript submitted: August 5, 2016

First revision submitted: January 7, 2018

Second revision submitted: June 1, 2019

Accepted: June 3, 2019

Electronically published: February 18, 2021