



The relationship between school mobility and students in foster care earning a high school credential



Elysia V. Clemens^{a,*}, Trent L. Lalonde^b, Alison Phillips Sheesley^a

^a Department of Applied Psychology and Counselor Education, University of Northern Colorado, United States

^b Department of Applied Statistics and Research Methods, University of Northern Colorado, United States

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ABSTRACT

This study examined the relationship between school mobility for Colorado students in foster care and educational attainment outcomes, specifically earning high school diploma, a high school equivalency diploma (e.g., through examination such as a GED), or exiting the K-12 system without a credential. Multinomial logistic regression was utilized to analyze the predictive role of school mobility related to high school educational attainment within a statewide sample of four cohorts of students who experienced out-of-home placements during high school. Results indicated that students in the foster care cohorts changed public schools an average of 3.46 times during their first four years of high school. As the average number of school changes increased, the odds of earning a high school diploma decreased and the odds of earning an equivalency diploma (e.g., GED) or exiting without a credential increased. Grade level analysis suggests that educational stability in ninth and twelfth grades may be particularly important to closing the high school graduation gap for students in foster care. A more comprehensive child welfare profile that includes frequency of residential moves, types of placements, and mental or behavioral health indicators was not included in analyses, and this limitation must be considered when using the results of this study to inform policy or practice.

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1. Introduction

Researchers have consistently found that the educational attainment of students who experience foster care is well below their non-foster care peers (National Working Group on Foster Care and Education, 2014). Students who exit the K-12 education system without a high school credential in the United States (U.S.) face significant economic and social challenges throughout the lifespan, including higher rates of teen pregnancy and delinquency (Baum, Ma, & Payea, 2010; Harlow, 2003; Manlove, 1998; Sum, Khatiwada, McLaughlin, & Palma, 2009). Individuals who drop out of high school are also less likely to secure employment than those with a high school diploma or equivalency degree (e.g., GED, Bureau of Labor Statistics, 2015a).

For those students in foster care who do earn a high school credential, the type of high school credential earned, either regular high school diploma or high school equivalency diploma, may also have a differential effect on employment and earnings (Okpych & Courtney, 2014). A regular high school diploma is earned through accruing the course credits to meet district graduation requirements; whereas, a high school equivalency diploma is earned through an examination, such as the General Education Development (GED) test. Students who earn regular

high school diplomas are more likely to earn higher salaries and more likely to enroll in post-secondary education than students who earn GEDs or otherwise demonstrate high school equivalency (Bureau of Labor Statistics, 2012; Heckman, Humphries, & Mader, 2010; Patterson, Song, & Zhang, 2009).

According to the National Center for Education Statistics, during the 2013–14 school year, 82.3% of students in the U.S. graduated from high school “on-time” (i.e., within four years after initially entering ninth grade) with a regular diploma. However, students in foster care typically graduate from high school at rates far below their non-foster care peers (Barrat & Berliner, 2013; Burley, 2013; Clemens, 2014; Colorado Department of Education, 2016). For example, in Colorado, the on-time rates ranged from 27.5% to 30.0% between 2012–13 and 2014–15 (Colorado Department of Education, 2016). During the 2010–11 school year in the state of Washington, Burley (2013) found that the graduation rates for foster care youth who were in care for >90 days was 50%, as compared to 75% for non-foster care youth. Washington state students in foster care for shorter period of times (i.e., one to two years) graduated at a lower rate (44%) than those in out-of-home care for three to four years (65%).

Although there is less information available on the rates of students in foster care earning a high school equivalency diploma versus a regular high school diploma, there is some evidence that students in foster care do so at disproportionately high rates compared to their non-foster care peers. The National Center for Education Statistics (2015) reported

* Corresponding author at: Department of Applied Psychology and Counselor Education, Campus Box 131, University of Northern Colorado, Greeley, CO, United States.
E-mail address: elysia.clemens@unco.edu (E.V. Clemens).

that in a nationally representative sample of all students who entered during the 2008–09 school year, 3% had earned a GED by the end of the 2012–13 school year. Colorado's state average was just below the national statistic with 2.7% of students in the Class of 2013 earning a GED. In comparison, 13.8% of Colorado students in foster care earned a GED or other certificate of completion in that same year (Colorado Department of Education, 2015). By age 20, 7% of Washington state students in the Class of 2009 had earned a GED, while 24% of students who were in foster care had earned a GED (Burley, 2013). Researchers nearly a decade earlier who tracked foster care youth in the Casey National Alumni Study to age 25 also reported rates of earning a GED that well exceeded the national non-foster care comparison data (Pecora et al., 2006). These findings suggest there may be systemic issues or barriers facing students in foster care relative to earning a regular diploma that differ from the general student population.

1.1. Definition of students in foster care

The federal definition of foster care states that it is “24-hour substitute care for children placed away from their parents or guardians and for whom the child welfare agency has placement and care responsibility” (45 C.F.R. § 1355.20(a) as cited in U.S. Department of Education & U.S. Department of Health & Human Services, 2016). This definition does not distinguish among placement types such as family-like foster homes, kinship care, group homes, and residential facilities and has applied to education law (U.S. Department of Education & U.S. Department of Health & Human Services, 2016). Furthermore, it is inclusive of both short-term foster care and long-term foster care.

There are a number of potential explanations for why students in foster care do not fair as well as their non-foster care peers. It is important to recognize that regardless of school mobility, youth in foster care are at a heightened risk for many behavioral and psychological concerns that may impact high school dropout rates (Pecora, Jensen, Romanelli, Jackson, & Ortiz, 2009; Petrenko, Culhane, Garrido, & Taussig, 2011). Foster care youth are more likely to suffer from mental health disorders in comparison to youth the general population (Havlicek, Garcia, & Smith, 2013). There are also likely differences within the foster care population related to educational attainment that may also be correlated with school mobility. Students who experience more school changes may also have behavioral challenges and, as such, school mobility may function as an instrument of behavioral risk factors (Rumberger, 2003; Swanson & Schneider, 1999).

1.2. School stability

The U.S. Department of Health & Human Services and the U.S. Department of Education have recently highlighted school stability and the importance of creating seamless transitions among schools (King & Burwell, 2016a; King & Burwell, 2016b; Lopez, 2016; Stapleton, 2016). Students in foster care change schools more frequently than their non-foster care peers. For example, approximately 10% of California students in foster care attended three or more schools during one academic year compared to approximately 1% of the general student population who attended the same number of schools (Barrat & Berliner, 2013). The school mobility rate for students in foster care in Colorado was nearly three times the state average in both the 2012–13 and 2013–14 academic years (Parra & Martinez, 2015).

The *Every Student Succeeds Act* (2015) mirrors and expands upon the educational stability provisions in the *Fostering Connections to Success and Increasing Adoptions Act* of 2008. These Acts provide protections, such as the right to remain in the school of origin (with transportation provided as needed), if that course of action is in the student's best interest. As child welfare and education agencies consider how to implement mandates with or without adequate funding, exploring the empirical connection between school changes and metrics by

which state and local education agencies are accountable may better inform the foster care educational stability action plan.

1.3. Purpose of the study

The purpose of this study was to explore the relationship between school mobility for students in foster care and educational attainment. Researchers tested the hypothesis that frequent school changes are among the factors associated with low graduation rates and disproportionately high rates of earning an equivalency diploma (e.g., GED). In addition, researchers explored the possibility that the effects of school mobility might differ depending on the grade level when school changes occurred. Multinomial logistic regression was utilized to analyze the predictive role of school mobility within a statewide sample of four cohorts of students who experienced out-of-home placements during high school. Educational attainment outcomes of interest were: (a) earning a regular high school diploma; (b) earning a high school equivalency diploma; and, (c) exiting the K-12 system without a high school credential. In addition, staying enrolled for more than four years after initially entering ninth grade was considered in some models. Results demonstrate the importance of implementing child welfare and educational policies that reduce disadvantageous school changes for students in foster care and the value of focusing on facilitating seamless transitions when a school change is in a child's best interest. If the results of this study are to be practically applied (as in informing the creation and implementation of public policies), additional factors beyond the scope of this study should be considered, such as the propensity for trauma and residential changes among this population of students.

2. Background on school mobility and earning a high school credential

Frequent school moves are negatively correlated with educational success for both students inside and outside of the foster care system. A longitudinal K-12 analysis of school mobility within a population of 1410 low-income minority children in Chicago revealed that the log-odds of graduating from high school on-time are reduced by 12–19% with each school change (Herbers, Reynolds, & Chen, 2013). Using a sample of 11,671 nationally-representative youth from the National Educational Longitudinal Survey, Rumberger and Larson (1998) found that <60% of students who changed schools two or more times between grades 8–12 for non-promotional reasons received a high school diploma at six years after initially entering ninth grade, and 16% earned a GED. In comparison, 86% of students who did not change schools received a high school diploma, while 4% earned a GED. Researchers studying predictors of educational attainment within nationally-representative samples of American high school students (and more specifically, in Chicago; Herbers et al., 2013; Ou & Reynolds, 2008) have found that school mobility predicts educational attainment when controlling for the significant effects other risk factors such as low socioeconomic status, homelessness, ethnic minority status, less parental involvement, and residential instability (Gasper, DeLuca, & Estacion, 2012; Herbers et al., 2013; Ou & Reynolds, 2008; South, Haynie, & Bose, 2007). Frequent school changes are more likely to predict educational outcomes than a single school change (Heinlein & Shinn, 2000; Herbers et al., 2013; Ou & Reynolds, 2008).

Researchers have suggested possible reasons that school mobility is related to poor educational outcomes. One proposed explanation is that highly mobile students experience disparities in curricula and instructional methods among teachers and adjusting to these differences distracts from the learning process (Herbers et al., 2013; Lash & Kirkpatrick, 1990; Mehana & Reynolds, 2004). Other authors surmised that students who move during an academic year may miss the opportunity to learn key concepts, leading to gaps of knowledge in their academic foundations (especially in math); this may contribute to a process of dissatisfaction and disengagement that eventually results in

dropout (Cutuli et al., 2013; Lee & Burkam, 1992). Adjusting to variations in schools' cultures and climates may also diminish students' capacities to learn new information (Temple & Reynolds, 1999). Studies specific to foster care youth concluded that differences in graduation requirements and losses of course credits due to incomplete or delayed transfers of school records are barriers to educational outcomes for highly mobile students (McMillen, Auslander, Elze, White, & Thompson, 2003; Zetlin, Weinberg, & Luderer, 2004).

Researchers investigating school mobility in a longitudinal sample of low-income, urban students identified differential effects of school mobility based on developmental periods when the school change occurred: early elementary, late elementary/middle school, and high school. Herbers et al. (2013) noted that two or more school moves occurring between fourth and eighth grades (i.e., late elementary/middle school) were negatively associated with highest grade completed and on-time graduation. Moves occurring in early elementary and high school were not significant predictors of on-time graduation in Herbers et al.'s (2013) model. The authors posited that the late elementary/middle school effects may be linked to the important developmental task of negotiating peer relationships: "...school changes that disrupt these relationships likely impact student school engagement, behavior, and motivation to succeed academically" (p. 16). For foster care students in middle and high school, peer relationships may play an even more significant role in the development of self-identity and self-esteem, which could cause school mobility to have a greater impact on school engagement and academic motivation (Kools, 1997).

Coleman's (1988) work regarding *social capital* provides an additional theoretical foundation for explaining the importance of school stability, beyond continuity in instruction and credit accrual, for students within and outside of foster care. *Social capital* related to education is defined as the relationships and interactions among students, parents, teachers, school administrators, and the school community that support educational success in a school. School mobility disrupts a student's ability to access and benefit from the human capital available at a school (i.e., teachers, mentors, and peer supports; Mehana & Reynolds, 2004). Much of the existing empirical research connecting school mobility to educational outcomes has been grounded in Coleman's theory (Teachman, Paasch, & Carver, 1996). Applied to students in foster care, it could be hypothesized that school represents a unique source of social stability and thus, social capital—a source that diminishes as school mobility increases.

Although prior research has illustrated a relationship between increased school mobility and low educational attainment, the complex relationship between school mobility and educational attainment for youth in foster care demands further examination. The purpose of this study is to examine how school changes in grades 9 through 12 predict educational attainment in a statewide sample of four cohorts of students who experienced out-of-home placements during high school. *School mobility* in grades 9 through 12 included moves directly associated with foster care placement changes as well as school changes that occurred for other reasons. Although this research is designed to extend the literature base by explicitly differentiating between types of high school credentials earned, there are limitations to applying models based on school counts to practice. Chiefly, some school changes are in a youth's best interest and simple count models do not account for the likely differential effects of such moves. Thus, the results of this study applied to policy and practice highlight the value of removing systemic barriers to school stability for students in foster care and supporting school changes based on an individual student's best interest.

3. Method

3.1. Sample

The sample ($n = 3357$) in the current study consisted of students who initially entered ninth grade between the 2007–08 and 2010–11

academic years and who experienced one or more out-of-home placements during high school. When students in Colorado initially enter ninth grade, they are assigned by the Colorado Department of Education a fixed "anticipated year of graduation" that is used to determine the rate at which groups of students graduate with their class (i.e., a cohort graduation rate). The foster care students in the current study were anticipated to graduate with the Classes of 2011, 2012, 2013, or 2014. The sample was drawn from Colorado Department of Education's longitudinal data set, and all students who met study criteria, as defined below, were included. Colorado Department of Human Services provides out-of-home placement data to Colorado Department of Education for purposes of identifying educational records of youth in foster care.

Typically, the cohort is adjusted for students exiting the public school system prior to their anticipated years of graduation and for those entering the public school system during high school. For the purposes of this study, Colorado business rules were applied, and students who transferred out of the Colorado public school system prior to anticipated years of graduation (e.g., moved out of state or enrolled in a private school) were removed from the sample. Students who transferred into the Colorado public school system after October 1st of the year they initially entered ninth grade, however, were not added to this sample because the information on school changes throughout high school would be incomplete. October 1st is the date that the state education agency computes the initial pupil membership for each year.

The data used to describe the demographic characteristics of the sample were how local education agencies reported the data to the state education agency. Some cases had discrepancies across school records, and those were resolved by first identifying the most frequently reported characteristic; if the mode was the same, the most recently reported data were used. Nearly half of the foster care students were reported as White (46.5%), and just over a third of the sample was reported as Hispanic or Latino (34.5%). Black or African American students comprised 14.5% of the sample. <2% of the sample was reported in each of the following federal race/ethnicity reporting categories: American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, and Two or More Races. There were more male students (53.8%) than female students (46.2%).

Additional analyses controlled for special education status and placement in a juvenile detention center. Just under one third (31.2%) of students in the sample received special education services during high school. One third (33.3%) of students were placed in a juvenile detention center one or more times. Foster care youth in juvenile detention centers receive educational services that are administered by local school districts and are included in state-level graduation rates.

3.2. Analytic approach and constructs

Multinomial logistic regression was used to model the probability of students reaching the milestone of a regular high school diploma, earning an equivalency diploma such as a GED, continuing their enrollment into the next academic year, or exiting the K-12 system without a high school credential (e.g., dropping out) based on their school mobility. The construct of school mobility was defined in two ways: (a) the total number of school changes was considered a continuous variable; and, (b) whether or not a school change occurred at each grade level was considered a categorical variable.

3.2.1. Total number of school changes

A school change was counted each time a student enrolled in a new Colorado public school after initially entering ninth grade. A base record was identified as the initial entry into ninth grade, and each subsequent entry into a new school or return to a previously attended school was counted as a school change. The various reasons for entry into a new school included changing from one school to another within the same district, re-entry after dropping out, or even completing a GED and then returning to pursue a high school diploma. Only school changes

that occurred during the first four years after initially entering ninth grade, or prior to when students were anticipated to graduate with their cohort, were counted.

3.2.2. Grade level school changes

An indicator variable was created for each high school grade level (grades 9 through 12) to denote if a student changed schools at a specific grade level. These data were included in the models to determine if mobility at specific grade levels changed the odds of earning a diploma versus a GED or other certificate of completion. Only school changes that occurred during the four years after initially entering ninth grade were considered in this variable.

Although all students entered ninth grade, remained in the foster care cohort, and were anticipated to graduate from a Colorado public school, not all students progressed to twelfth grade within four years. A small percentage (1.4%) of students did not progress beyond ninth grade, 6.6% of students progressed to tenth grade but not beyond, 18.6% progressed to eleventh grade but not beyond, and the majority (73.3%) were enrolled in twelfth grade by the time they were anticipated to graduate with their classes. Students who did not progress to a given grade level (e.g., twelfth grade) were coded as not changing schools at that grade level.

3.2.3. Earning a high school credential

There were two types of high school credentials relevant to this study, a regular high school diploma and an equivalency diploma (i.e., through examination such as a GED). In all models, high school diplomas and equivalency diplomas were treated as separate outcomes. Both of these were defined as reaching the milestone in a specific amount of time, within four years or six years after initially entering ninth grade.

The fixed “anticipated year of graduation” assigned by the state department of education when students initially entered ninth grade was used to calculate the length of time it took students to reach the milestone. On-time graduation occurred if the milestone was reached within four years of initially entering ninth grade (i.e., if the student graduated with his or her class). The observed on-time graduation rate in the sample was 28.5%, and an additional 9.4% of the students earned a high school equivalency diploma (e.g., GED) within four years time. High school credential outcomes were also measured at six years after initially entering ninth grade. The six year graduation rate (i.e., extended time graduation rate) was 37.2%, and 11.9% of students earned a high school equivalency diploma within six years. For school years included in the study, the GED was the predominate method of earning a high school equivalency diploma.

3.2.4. Remaining enrolled or re-enrolling in high school

In addition to educational attainment, continuing education was included as a possible outcome at four years' time. Students who were still enrolled or who re-enrolled in a Colorado public school after their anticipated years of graduation were coded as “continuing their high school education.” In this sample, 28.2% of students in foster care continued their education.

3.2.5. Exiting the K-12 system without a high school credential

Students who were not reported as earning a high school credential or continuing their education were coded as exiting the K-12 system without a high school credential. This outcome was included in analyses at four years after initially entering ninth grade and six years after initially entering ninth grade. As previously noted, students who transferred to an approved educational environment were not part of the sample. The outcome of exiting without a high school credential is analogous to dropping out and staying out of high school. One third (33.9%) of students in this sample exited without a high school credential during or before their anticipated years of graduation.

3.2.6. Control variables

Two categorical control variables were entered into the models to serve specific purposes. An indicator of students who received special education services at any point during high school was included because prior research on Colorado students in foster care demonstrated that this subpopulation of students is more likely to stay in school (not drop out) and also graduate at lower on-time rates than their general education foster care peers (Clemens, 2014). Some youth in special education age out of the K-12 system at the end of the school year in which they turn 21.

An indicator of placement in a juvenile detention center for one or more days during high school was also entered as a control variable. Youth in Colorado are typically admitted into a secure detention center as a result of warrants/remands for failure to appear or comply with court orders (44.5% in 2013–14) or as a result of being preadjudicated (37.0% in 2013–14; Wass, McGuire, Fox, & Gallagher, 2015). The length of stay in juvenile detention centers is typically brief, and the median length of stay was 6.7 days in 2014–15 (Wass et al., 2015). This control variable was included in the model as a behavioral risk factor.

4. Results

The school mobility variables in this study reflected instability that occurred during the first four years after students in the sample initially entered ninth grade or the events that occurred up until the point in time when the students were anticipated to graduate from high school. Students in the foster care cohorts changed Colorado public schools an average of 3.46 times during their first four years of high school ($SD = 2.69$, $range = 0-18$). Only 10.4% of students did not change high schools. Students who were placed in juvenile detention centers changed schools the most frequently. Additionally, African American or Black students changed schools more often than other races/ethnicities. Furthermore, males experienced more school changes than female students in foster care. The complete descriptive statistics are reported in Table 1.

4.1. Model 1: educational attainment within four years of initially entering ninth grade

The analysis was first conducted with the full range of school changes (0–18) as the independent variable. The cell sizes became small at higher numbers of school changes, causing problems with model convergence and hypothesis testing; therefore, the data were collapsed such that the largest numbers of school changes represented a single category of 10 or more school changes. The dependent variable consisted of four outcome categories: (a) regular high school diploma; (b) GED examination or other certificate of completion; (c) continued education beyond four years; or, (d) exited the K-12 system without a high school credential. Earning a regular high school diploma was set as the reference category because it is generally accepted that this is the most ideal of the stated outcome categories. Therefore, all odds are calculated with the event of a high school diploma as the reference or denominator.

The total effect of the number of school changes was significant in the overall model, as well as for each comparison of pairs of outcomes when controlling for special education status and placement in a juvenile detention center ($\chi^2(3) = 113.38, p < 0.01$). Changing schools in ninth ($\chi^2(3) = 16.47, p < 0.01$) and twelfth grades ($\chi^2(3) = 73.13, p < 0.01$) were also significant indicators of earning a high school credential. In the subsequent sections, results of the comparison of odds of each outcome to the reference category of earning a regular high school diploma are presented.

4.1.1. Exiting without a high school credential

The number of school changes is positively correlated exiting the K-12 system without a high school credential (i.e., dropping out and

Table 1
Number of school changes.

	Mean	Median	Mode	SD	Skewness	SE Skewness	Kurtosis	SE Kurtosis	Range
Full sample	3.46	3.00	3	2.69	1.25	0.05	2.40	0.08	18
Special education	3.46	3	3	2.82	1.35	0.08	2.65	0.15	18
Juvenile detention	5.63	5	5	2.8	1.13	0.07	1.66	0.15	17
White	3.26	3	3	2.56	1.34	0.06	2.95	0.12	18
Hispanic or Latino	3.48	3	3	2.69	1.26	0.07	2.48	0.14	18
African American or Black	4.18	4	3	3.04	0.93	0.11	1.13	0.22	16
Male	3.76	3	3	2.92	1.21	0.06	2.03	0.16	18
Female	3.10	3	3	2.34	1.20	0.06	2.06	0.12	16

staying out). If the average number of school changes increased by one, the odds of exiting without a high school credential versus graduating as expected were 39% greater. When school change indicators were held constant (i.e., total number of school moves and grade level), youth who had one or more juvenile detention center placements were more likely to either earn a diploma or stay enrolled in high school than to exit without a credential. If one or more school changes occurred in twelfth grade, holding other indicators in the model constant, the odds of exiting without a high school credential were expected to be 166% greater than earning a diploma.

4.1.2. Remaining enrolled or re-enrolling in high school

If the average number of school changes increased by one, the odds of staying enrolled beyond the year of anticipated graduation versus graduating as expected were 63% greater. If the number of school changes during high school were the same for a given student, the odds of staying in school or re-enrolling in high school were 46% greater for students if one or more of those schools moves occurred in ninth grade. Holding the school mobility variable constant, students who experienced a juvenile detention center placement were more likely to still be enrolled in high school when their class graduated; whereas, students who received special education were more likely to have graduated with their class than to still be enrolled.

4.1.3. Earning a high school equivalency diploma

High school equivalency diplomas are earned through state-approved examinations. For students in the current study, as previously noted, the GED was the predominant option for an equivalency exam.

The odds of earning an equivalency diploma were 136% greater for those students who changed schools in twelfth grade, as compared to those students who did not change schools in twelfth grade. Students who experienced a juvenile detention center were more likely to graduate with their class than to earn a high school equivalency diploma; in contrast, special education students in foster care were more likely to earn an equivalency diploma than to graduate from high school on-time (See Table 2).

4.2. Model 2: educational attainment within six years of initially entering ninth grade

The second model uses a subsample of the original data and includes students in foster care in the Classes of 2011 and 2012 cohorts ($n = 1826$). The same predictor variables were entered into this model; however, outcomes were instead measured at six years after initially entering ninth grade instead of at four years. The average age of students in this model was 20.6 years when the outcomes were measured. Twenty students aged out of the K-12 system five years after initially entering ninth grade (i.e., turned 21 before the sixth year). All school change data were limited to events that occurred during students' first four years of high school in order to facilitate discussion of effects over time. Three outcomes were included in the categorical dependent variable: (a) exiting without a high school credential; (b) earning a GED or other certificate of completion; or, (c) earning a regular high school diploma. Continuing high school education was not included as an outcome variable in this model.

Table 2
Four year on-time outcomes.

Outcome	B	Std. Error	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Exited without credential	-1.04	0.34	9.21	1	<.001		
Number of school changes	0.33	0.04	64.87	1	<.001	1.39	[1.29, 1.51]
Juvenile detention center	-0.73	0.13	31.56	1	<.001	0.48	[0.37, 0.62]
Special education	-0.09	0.10	0.71	1	0.40	0.92	[0.75, 1.12]
12th grade school change	0.98	0.13	54.13	1	<.001	2.66	[2.05, 3.46]
11th grade school change	0.15	0.11	1.76	1	0.18	1.16	[0.93, 1.45]
10th grade school change	-0.08	0.11	0.52	1	0.47	0.92	[0.74, 1.15]
9th grade school change	-0.02	0.11	0.02	1	0.88	0.98	[0.79, 1.23]
Continued high school education	-1.75	0.36	24.00	1	<.001		
Number of school changes	0.49	0.04	134.34	1	<.001	1.63	[1.50, 1.77]
Juvenile detention center	0.31	0.14	4.86	1	0.03	1.36	[1.04, 1.80]
Special education	-0.66	0.10	40.83	1	<.001	0.52	[0.42, 0.63]
12th grade school change	0.22	0.13	3.17	1	0.08	1.25	[0.98, 1.60]
11th grade school change	0.04	0.12	0.12	1	0.73	1.04	[0.83, 1.31]
10th grade school change	0.15	0.12	1.59	1	0.21	1.16	[0.92, 1.46]
9th grade school change	0.38	0.12	10.04	1	<.001	1.46	[1.15, 1.84]
High school equivalency (GED)	-3.19	0.47	45.59	1	<.001		
Number of school changes	0.39	0.05	56.30	1	<.001	1.47	[1.33, 1.63]
Juvenile detention center	-0.53	0.18	8.87	1	<.001	0.59	[0.41, 0.83]
Special education	0.76	0.18	18.55	1	<.001	2.15	[1.52, 3.04]
12th grade school change	0.86	0.19	21.39	1	<.001	2.36	[1.64, 3.40]
11th grade school change	0.08	0.16	0.24	1	0.62	1.08	[0.80, 1.46]
10th grade school change	-0.13	0.16	0.62	1	0.43	0.88	[0.65, 1.21]
9th grade school change	0.05	0.16	0.08	1	0.77	1.05	[0.77, 1.43]

Note. The reference category is earning a high school diploma.

Similarly to Model 1, the effect of the total number of school changes was significant in the overall model, as well for each comparison of pairs of outcomes when controlling for special education status and placement in a juvenile detention center ($\chi^2(2) = 6.66, p = 0.04$). Grade level effects differed between the on-time (Model 1) and extended time models (Model 2). In the extended time model, changing schools in eleventh grade ($\chi^2(2) = 13.28, p < 0.01$) and twelfth grade ($\chi^2(2) = 13.28, p < .01$) were significant predictors of the odds of exiting without a credential as compared to earning a high school credential.

Comparisons across outcomes revealed that students who changed schools in eleventh or twelfth grades were more likely to exit without a high school credential than to earn either a diploma or a GED (see Table 3). The effect of school changes in twelfth grade was greater than the effect of changes that occurred during eleventh grade as evidenced by the odds ratios of 1.73 for twelfth grade moves and 1.40 for eleventh grade moves. Changing schools at a specific grade level did not significantly predict whether a student would earn a GED as compared to a diploma

5. Discussion

This study demonstrates that the more frequently students in foster care change schools, the less likely they are to exit the K-12 educational system successfully. This finding aligns with the extant foster care and education literature, as well as the underlying premises of legislation addressing educational stability (Every Student Succeeds Act, 2015; Fostering Connections to Success and Increasing Adoptions Act of 2008, 2008; National Working Group on Foster Care and Education, 2014). Educational stability includes reducing school changes to those that are in a child's best interest and facilitating seamless transitions when a school change is necessary. In the current study, the number of school changes was used as an indicator of educational stability within the foster care student population. Treating school changes as an indicator rather than the focus of application reflects trends in literature describing the negative consequences of school changes such as gaps in learning, credit accrual challenges, and loss of social capital or connectedness to the school community (e.g., Cutuli et al., 2013; McMillen et al., 2003; Mehana & Reynolds, 2004).

Even when these policies are fully implemented, it is likely that some students in foster care will need additional services to address the adverse consequences of educational instability that may have occurred prior to an out-of-home placement and also to maintain educational stability beyond when their involvement with child welfare ends. The majority of students in this study (59%) experienced three or more school changes during high school. Researchers studying mobility in various populations (i.e., within low-income, minority student samples and within nationally-representative samples) have

established that three or more high school changes is negatively correlated with educational progress, achievement, and attainment (Gasper et al., 2012; Herbers et al., 2013; Rumberger & Larson, 1998).

Thus, even when sound policies and practices are fully implemented, some youth may be entering the child welfare system having already changed schools multiple times during high school and others may be at-risk for experiencing educational instability after case closure. Targeted services may be needed to address each individual student's foundational gaps in learning, support progress toward meeting graduation requirements, and facilitate engagement in the school community at three key points—entry to, during, and after out-of-home care. Coordination among local child welfare agencies and schools is needed to ensure that students' educational needs are met during all phases of child welfare cases and beyond.

The potential for economic disparities associated with the type of credential earned was raised by the *Midwest Evaluation of the Adult Functioning of Former Foster Care Youth* researchers (Courtney et al., 2011). Improving educational stability may lead to increases in the percentage of students in foster care graduating with their class and reduce the disproportional rate of students exiting with an equivalency diploma (e.g., a GED). In the on-time and extended time models, fewer school changes were correlated with higher expected graduation rates. As the average number of school changes increased, the odds of earning a high school equivalency diploma were 47% greater at four years after initially entering ninth grade. When assessed at six years after initially entering ninth grade, the odds were similar. Thus, this study's overall findings support the research hypothesis that the number of school changes predicts not only rates of earning a high school credential but also the proportion of students earning a regular diploma versus an equivalency diploma (e.g., GED).

5.1. Grade level effects

The ninth grade year is frequently described by students, parents, and teachers as a pivotal transition point in the American education system (Akos & Galassi, 2004). Researchers have found that passing ninth grade core classes is a strong predictor of high school graduation (Edwards, Olson, & Swanson, 2007; Neild, Stoner-Eby, & Furstenberg, 2008). In the current study, students in foster care who changed schools in ninth grade were more likely to still be enrolled in high school when their class graduated than to have earned a diploma. This grade level finding was significant in the presence of total number of school moves. Thus, ninth grade school moves might be considered as an early warning indicator or a flag that could be embedded in child welfare data systems. A closer examination of foundational academic skills, credit accrual, and progress toward meeting local graduation requirements could benefit these students, even if the total number of times

Table 3
Six year extended time outcomes.

Outcome	B	Std. error	Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Exited without credential	−0.93	0.39	5.63	1	0.02		
Number of school changes	0.35	0.05	56.56	1	<0.01	1.42	[1.29, 1.55]
Juvenile detention center	−0.05	0.12	0.16	1	0.69	0.95	[0.76, 1.20]
Special education	−0.58	0.15	14.51	1	<0.01	0.56	[0.42, 0.75]
12th grade school change	0.55	0.15	13.24	1	<0.01	1.73	[1.29, 2.33]
11th grade school change	0.34	0.13	6.50	1	0.01	1.40	[1.08, 1.81]
10th grade school change	−0.17	0.13	1.78	1	0.18	0.84	[0.66, 1.08]
9th grade school change	0.20	0.13	2.33	1	0.13	1.22	[0.95, 1.57]
Earned a GED or certificate	−2.94	0.55	28.47	1	<0.01		
Number of school changes	0.37	0.06	39.09	1	<0.01	1.45	[1.29, 1.63]
Juvenile detention center	0.91	0.21	18.43	1	<0.01	2.49	[1.64, 3.77]
Special education	−0.74	0.21	11.92	1	<0.01	0.48	[0.32, 0.73]
12th grade school change	0.36	0.21	2.89	1	0.09	1.43	[0.95, 2.17]
11th grade school change	0.29	0.19	2.34	1	0.13	1.33	[0.92, 1.93]
10th grade school change	−0.15	0.19	0.60	1	0.44	0.86	[0.59, 1.25]
9th grade school change	0.16	0.19	0.67	1	0.41	1.17	[0.81, 1.70]

Note. The reference category is earning a high school diploma.

a student has changed schools is relatively low or the school changes occurred before the child welfare case opened.

The majority of students in the sample (73.3%) progressed to twelfth grade within four years of initially entering ninth grade, but only 28.5% graduated with their class. The odds of students exiting the K-12 system without earning a credential were 166% greater as compared to earning a regular high school diploma for students who changed schools in twelfth grade. Similarly, the odds of earning an equivalency diploma (e.g., GED) were 163% greater as compared to earning a regular high school diploma. Colorado is a local control state, so graduation requirements differ across the 178 school districts. It is possible that some of these students may have accrued enough total credits to be classified as twelfth graders, but they were practically much further from meeting all graduation requirements. For example, a student may take a class at High School #1 because it is required for graduation, but that same class is not required at High School #2, so it is counted as an elective credit. This distance from meeting graduation requirements may be exacerbated by a school change in twelfth grade, so the larger odds ratios may reflect the impracticality of earning a high school diploma. Further examination is recommended to determine the degree to which these large odds are confounded by the functional realities of promotion practices that may come into fruition in twelfth grade.

Tracking cohorts to six years after initially entering ninth grade, the grade level effect was still significant but smaller in magnitude. The odds of earning a GED were 76% greater than earning a high school diploma when students changed schools in twelfth grade. The magnitude of the twelfth grade effect was greater than the effect of the total number of school changes on earning a high school equivalency diploma (e.g., GED). The odds of exiting without a credential (e.g., dropping out and staying out) were 43% greater than earning a diploma with a twelfth grade move, which is similar to the magnitude of the effect of the total number of school changes on this outcome. These extended time models count only the school moves that occurred during the first four years of high school. Thus, the effects of the total number of school changes in twelfth grade reported in the extended time (six year) models only included school moves that occurred prior to the anticipated year of graduation.

5.2. Subpopulations within the foster care student cohorts

The population of students in foster care cohorts is defined in this research as those youth who experienced a child welfare out-of-home placement during high school. Approximately one third of those students also received special education services. A similar, not mutually exclusive, percentage was placed in a juvenile detention center at some point during those first four years of high school. Categorical variables denoting these subpopulations of students in the foster care cohorts yielded noteworthy findings.

5.2.1. Special education students in foster care

Ultimately, foster care students in special education with similar rates of school mobility are more likely to earn a regular high school diploma than a GED or no high school credential. The odds look different at four years than at six years after initially entering ninth grade. At four years after initially entering ninth grade, students in foster care who received special education services were most likely to have earned a high school equivalency diploma (e.g., GED) when school mobility was held constant. The odds of graduating with their class or exiting the K-12 system without a diploma were similar. Following cohorts for additional years and measuring outcomes at six years after initially entering ninth grade indicated that the educational attainment odds of earning a high school credential improved with more time. Implementation of policies that extend foster care beyond age 18 might be particularly beneficial for youth who have special education needs. For example, Schifter (2011) found that for students with disabilities, the maximum

conditional probability of graduating occurred five years after initially entering high school.

5.2.2. Cross-over youth: juvenile justice and foster care

The Colorado foster care student population is defined by a child welfare out-of-home placement. Some of these youth are “cross-over” youth, meaning that in addition to a dependency and neglect case they also have a delinquency case. In the current study, a control variable of admission to a juvenile detention center was used as a behavioral indicator and as a basic means of accounting for this difference within the foster care student population

Specifically, the categorical variable was defined as students in the foster care cohorts who were also placed in a juvenile detention center at any point after entering ninth grade. During the 2013–14 school year, the most common reasons for admission were warrants/remands for failure to appear or comply with court orders (44.5%), preadjudicated youths (37.0%), and detention sentences (10.1%; Wass et al., 2015). During the time period that youth were admitted to detention centers, they received educational services through a district-run school.

Although three school changes or attending four high schools was most typical for other students in the sample, students who were placed in a juvenile detention center during high school changed schools at a higher rate. The mean number of school moves for this subsample of students placed in juvenile detention centers was 5.63, as compared to 3.47 in the full sample. Thus, students in foster care with juvenile justice involvement may experience more school instability than the foster care student population as a whole. This finding aligns with literature identifying increased behavioral risk factors for highly mobile students (Rumberger, 2003; Swanson & Schneider, 1999).

Placement in a juvenile detention center was a significant factor in all models and most comparisons. A particularly noteworthy finding in the four year model is that when school change indicators were held constant (i.e., total number of school moves and grade level), youth who had one or more juvenile detention center placements were more likely to either earn a diploma or stay enrolled in high school than to exit without a credential or earn a high school equivalency diploma (e.g., GED). This study provides support to literature base suggesting that delinquency court involvement, juvenile detention center placements, probationary periods, and/or associated educational or support services may be related to successful progression toward on-time graduation for an educationally vulnerable population of youth (Drakeford, 2002; Guerin & Denti, 1999).

However, at six years after initially entering ninth grade, the odds are quite different. At six years, the odds of earning a high school equivalency diploma (e.g., GED) are 149% greater than earning a high school diploma for youth who experienced a juvenile detention center placement during the first four years of high school. The average age of students at four years after initially entering ninth grade was 18.6, and at six years after initially entering ninth grade, it was 20.6. Considering the four year and six year models in combination, these findings suggest that for cross-over youth, the current window to increase the percentage of youth who earn a diploma is within the first four years after initially entering ninth grade. After age 19, it is much more likely that cross-over youth will earn an equivalency diploma (e.g., GED) than a regular high school diploma.

6. Limitations

The results of this study are relevant to students who are similar to those in this research sample, so proposed policy or practice changes must first take into account the characteristics of this particular sample of Colorado students. Additionally, the educational attainment of students in foster care has been stable in Colorado for a number of years (Clemens, 2014; Martinez, Fritz, & Rosa, 2014; Parra & Martinez, 2015). The state school mobility rate, or unduplicated count of students who changed schools, was identical in 2012–13 and 2013–14 (Parra &

Martinez, 2015). Thus, it is reasonable to use these findings to inform policy and practice in Colorado for the period of time that the population of students in foster care remains similar to those students included in the study. When the population changes, as in the case of markedly improved graduation rates or significant decreases in school mobility, it will be important to conduct follow-up studies. Similarly, policymakers and practitioners in other states should consider similarities and differences between the characteristics of students in foster care they serve and Colorado students in the Classes of 2011 to 2014 when making determinations about generalizability of these findings.

Although this research may provide insight into the potential return on investment for implementing the educational stability provisions of *Fostering Connections* (2008) and *ESSA* (2015), it does not indicate the degree to which the foster care educational stability portions of these Acts have been implemented in Colorado. Additionally, the analyses considered the total number of school changes youth experienced in high school and grade level mobility, regardless of whether or not school changes were associated with foster care placement changes. It is possible that some school changes were in the best interest of youths in the sample, and further research could consider the possibility of a differential effect. As previously noted, school mobility incidents may have occurred prior to, during, or after out-of-home placement changes.

This study leveraged a state education administrative dataset. Although students in foster care were identified in this dataset based on information provided by the state human services agency, youths' complete child welfare profiles, including types of placements, lengths of time in care, and indicators of mental or behavioral health, were not available at the time of this study. It is certainly possible that unmeasured, confounding variables were included in the analyses and findings.

6.1. The confounder of behavioral risk factors

While prior research has suggested a relationship between school mobility and low educational attainment, behavioral risk factors undeniably confound this relationship. Specifically, students who experience more school changes may also have behavioral challenges and, as such, school mobility may function as an instrument of behavioral risk factors (Rumberger, 2003; Swanson & Schneider, 1999). Herbers et al.'s (2013) study demonstrated that a count of yearly school moves between kindergarten and twelfth grade predicted unique variance in young adult outcomes including the "number of depression symptoms at the age of 23, having graduated high school on-time, and having ever been arrested as an adult" (p. 15). However, an important study of non-foster care youths using seven waves of data from the National Longitudinal Survey of Youth 1997 by Gasper, DeLuca, and Estacion (2010) found that when controlling for pre-existing differences between mobile and non-mobile youth in their propensity for delinquency, the relationship between mobility and delinquency was spurious.

Regardless of school mobility, youth in foster care are at a heightened risk for many behavioral and psychological concerns that may impact high school dropout rates (Pecora et al., 2009; Petrenko et al., 2011). In a literature review of 17 peer-reviewed articles, Havlicek et al. (2013) concluded that "foster youth are 2 to 4 times more likely to suffer from lifetime and/or past year mental health disorders compared to transition aged youth in the general population" at age 17 or 18 (p. 199). However, the authors suggested caution regarding interpretation or comparison of existing research because so few studies of the mental health of youths in foster care have implemented a rigorous sampling strategy, in addition to assessing for mental health disorders utilizing standardized diagnostic instruments (Havlicek et al., 2013, p. 200).

6.2. The confounder of positive school changes

Due to the inherent limitations of existing research, the possibility exists that school changes can be positive events for children and

youth in foster care, although no recent studies with this conclusion could be identified (Jones, 1990; Mehana & Reynolds, 2004). In this study, positively motivated school changes may have affected the relationship between school mobility and credential status, likely weakening the association. Future research could attempt to address these specific confounders and the other limitations of this study.

7. Directions for future research

School mobility is correlated with educational attainment and warrants continued attention. A future predictive study might consider the interaction between foster care placement stability and school changes or contextual factors such as prior achievement, in addition to length of time or age of entry into the child welfare system. Future research might also consider relative stability metrics such as the ratio of child welfare placement changes to school changes or isolating school moves associated with placement changes. The timing of school changes could also be considered more thoroughly. For example, Grigg (2012) found that school moves during the middle of the school year appeared to be more disruptive than moves occurring between school years. The focus of this study could be replicated with a full sample of cross-over youth who are involved with both the child welfare and juvenile justice systems. As states continue to implement the educational stability provisions in *Fostering Connections* (2008) and *ESSA* (2015), there may be future opportunities to evaluate the causal impact of these policies on the ultimate educational success of students in foster care.

8. Conclusion

The well-documented social and economic difficulties for students who exit the K-12 education system without a credential in the U.S. create an imperative for practitioners and policymakers to continue to take action toward improving educational attainment for youth in foster care. The broad conclusion of this study is that frequent school moves within the foster care student population are associated with low graduation rates and disproportionately high rates of earning an equivalency diploma (e.g., GED). More specifically, there are subpopulations within the foster care student group that may require different approaches in order to close the high school education attainment gap, particularly, students receiving special education services and students with significant juvenile justice involvement. Future research might discern how the child welfare profile (e.g., placement patterns, type of abuse or neglect, mental health needs) might further elucidate education-relevant sub-populations of students in foster care. For all foster care students, the variables included in this study suggest that school stability in ninth grade is an important component of progression toward on-time high school graduation, as echoed in the general education literature (Akos & Galassi, 2004; Edwards et al., 2007; Neild et al., 2008).

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