Foster Youth Stability

A study of California foster youths'
school and residential changes in relation to
educational outcomes

Acknowledgements

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Introduction

Each year in California, more than 7,000 youth between the ages of 8 and 13 are removed from their home due to abuse and neglect and placed into foster care.[i] For many of these youth, challenges associated with the family environment and entry into an out-of-home placement may serve as a turning point and alter academic performance trajectories.[ii]

Though prior investigations indicate that the educational attainment of foster youth is poor,[iii] negative performance is reported as if all foster youth fail without considering differences among individual foster youth. While collectively foster youth may have increased risk due to maltreatment and removal from home, other correlating factors including educational risks prior to entry, child welfare case characteristics, and residential and school changes may be associated with differences in foster youth academic performance.

Largely absent from prior investigations is the exploration of academic performance and foster care exit type outside of emancipation (when foster youth age out of the system). Additionally, past research has focused primarily on the relationship among school transfers, placement changes, and academic performance with little regard to normative school transitions (school changes that happen for all youth, e.g., moving from elementary school to middle school). School transitions are often sorting points where academic pathways diverge. It may be that in conjunction with education and child welfare case characteristics, residential and school changes lead to decreased adjustment and academic performance for some foster youth.

The purpose of this investigation was to understand how various education and child welfare characteristics influence English and math levels on the California Standards Test (CST) over time. English and math performance levels were followed for a maximum of three years post baseline for each student. We included two primary samples. The first sample included foster youth closely matched to nonfoster students on characteristics from the year prior to entrance into foster care placement. Adjusting for the association with educational risk factors, an investigation as to whether trends in foster youth academic performance vary significantly from nonfoster youth was explored. The second sample included only foster youth, which was used to focus on heterogeneity in English and math outcomes. These investigations examined the relationships among education risk factors, child welfare case characteristics, and residential and school changes in relation to academic performance over time.

Methods

Please see the Technical Appendix for detailed information regarding data and methods.

This study linked two primary data sources: administrative child welfare records from California Child Welfare Services/Case Management System (CWS/CMS), coordinated by the Center for Social Services Research at University of California, Berkeley, and education records from the California Partnership for Student Success (Cal-PASS), managed during the period of this study by the Institute for Evidence-Based Change (IEBC). Additional data from the California Department of Education (CDE) provided information about school quality.

In this study, performance on the CST was used to assess academic performance. The CST, administered every year for students in grades two to 11, is used to determine how well students have learned specific grade-relevant information. At each grade level, topic-specific scaled scores are converted to an aptitude level that includes far below basic, below basic, basic, proficient, and advanced. As it is the goal of the CDE that every student perform at the proficient or above level, the two categories of proficient and advanced are combined for a total of four possible levels.

From the linked data set, foster youth who entered into out-of-home placement in grades three to eight during school years 2003–04 to 2006–07 were sampled. Only youth with Standardized Testing and Reporting (STAR) demographic data were identified for inclusion. In addition, foster youth must have had a minimum of two out of four years of test score data on the CST, with one of those years at baseline (i.e., the year prior to foster care entry). Two separate samples were extracted for English language arts (ELA) and math. In addition to the two primary samples, foster youth were matched to nonfoster youth students closely at the baseline year. The foster youth samples were matched to comparison students by grade level, school year, gender, ethnicity, English Language Learner (ELL) status, National School Lunch Program (NSLP), primary disability, district or school, state rank, and baseline CST level. In the math sample, foster youth and non-foster youth were additionally matched by math course level for older youth.

Analyses included sample means and proportions for all education, demographic, and child welfare case characteristics. Differences in the means and proportions were calculated among groups. In addition, hierarchical longitudinal multinomial regression models were used to examine whether differences in education outcomes among CST levels were maintained after controlling for various characteristics. In these analyses, level one encompassed changes in CST performance levels over time and level two pertained to how these changes varied across individual students.

While there is a clear ordering of the CST levels, in analyses the levels are treated as nominal due to violation of the proportional odds assumption. This assumption assumes that the relationship between each CST level is the same and provides a single estimate of the outcome variable in relation to the independent variables (e.g., special education status). The proportional odds assumption was tested and the p-value was significant in all samples. Therefore, combining the parameters for the explanatory variables was rejected and CST levels were treated as nominal.

A weighting formula was utilized in the regression models to ensure that the samples of students with education data represented the appropriate statewide population. The samples were weighted by gender and ethnicity. In addition, while each youth had baseline and one additional year of CST data, there were instances of missing values for Years 1 to 3. In order to include as many youth as possible, missing values were generated via multiple imputation.

Summary of Findings

The purpose of this investigation was to understand the relationship of foster youths' school changes and placement changes to school performance in English and math as reflected on the CST over time.

Highlights

1. A high level of school and residential changes was associated with lower academic performance as measured by the CST.

2. For foster youth, education at-risk factors present prior to entry into foster care placement were more reliable predictors of academic performance over time than the majority of child welfare case characteristics.

3. Foster youth were less likely to have higher levels of proficiency on the CST compared to nonfoster youth and were less likely to increase their CST performance over time.

4. Findings underscored the need to identify subgroups of vulnerable foster youth with the greatest need for additional educational support. Similar to other at-risk students, foster youth who were poor, non-White, and had disabilities (i.e., special education status) struggled on standardized tests more than others.

5. Placement variables: The association among school quality, placement changes, school transfers, and academic performance is complex. While remaining in the same school has potential benefits for some students, it may not support the educational best interest for many foster youth. Remaining in the same school after entry into foster care may mitigate the number of changes a youth experiences. However, having foster students remain in low-performing schools may impede long-term academic achievement.

Implications for Further Research:

- Future research that includes a more refined measure of school quality will help to unravel the association of school quality, residential and school movement, and academic outcomes for foster youth.

- While youth were followed for three years post entry into foster care in this study, more time may be needed to understand how group home placement is associated with long-term educational success.

- Future research that explores details of kin placement or group home placement may add to our understanding of the association between placement and academic performance.

Results

Approximately 98% of the same foster youth were included in both the English and math samples, and more than 86% of the matched population also included the same youth. Hispanic foster youth made up more than 50%, with Black foster youth encompassing 25% of all samples. More than 75% of youth participated in the NSLP, and more than 50% attended poor quality schools at baseline. (School quality rating is based upon the California state rank, which is calculated from the Annual Performance Index, or API.) Approximately 25% were designated English Language Learner (ELL) students.

There were a few significant differences between the foster youth and matched foster youth samples. The matched samples had a greater proportion of NSLP students (84% vs. 75%) and a smaller proportion of foster youth with a documented disability (9% vs. 15%). In the English sample, a lower proportion of matched youth were in foster care for the first time (69% vs. 77%). In both English and math, fewer foster youth had reunified with family (42% vs. 53%) and a larger proportion were still in-care (48% vs. 38%) by the end of the study years compared to the matched sample.

There were no significant differences in CST levels at baseline between the initial and matched samples, nor were there any significant differences between the initial and matched samples when considering time variant predictors such as school transfers and transitions, and placement changes and exits.

Foster Youth and Matched Comparison Sample

School Movement

Two types of school movements were included: school transitions and school transfers. A school transition was defined as a normative change between school segments (e.g., elementary school to middle school). A school transfer was defined as an unscheduled school change in the same school type (e.g., elementary school in one locale to elementary school in another). School attended was based on CST data, which is reported only once a year. Therefore, a student could not experience a school transfer and transition in the same year and the two categories were mutually exclusive in this study.

Overall, approximately 95% of foster youth experienced some type of school change in Year 1 compared to 37–38% of the matched students. In Year 2, 72% of foster youth changed schools compared to 47–49% of the nonfoster youth sample.

Most of the variation in school movement stemmed from school transfers (Figure 1). Significantly higher proportions of foster youth transferred schools compared to the matched students. In Year 1, 75% of foster youth in our samples transferred schools compared to 21–22% of the matched comparison students. In Year 2, 49% of foster youth changed schools compared to 21–22% of the

Figure 1: Foster Youth and Comparison Sample, English and Math, Percent of School Transfer and Transitions in Year 1 and Year 2

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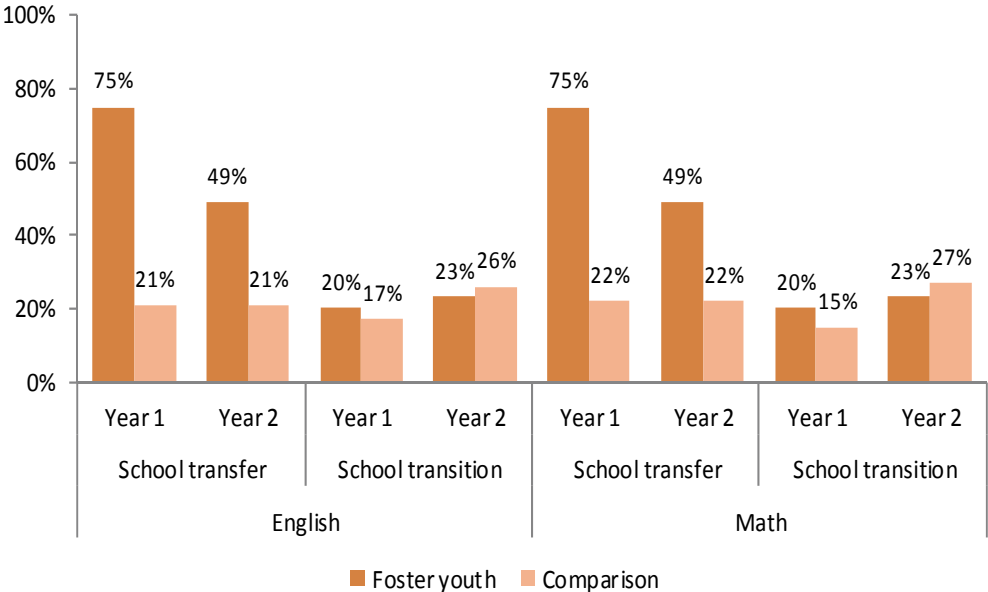
matched students. There were no significant differences in school transitions in the English sample. In the math sample, a higher proportion of foster youth experienced a school transition in Year 1, and a higher proportion of comparison students experienced a school transition in Year 2. The sum of the two years was very close (i.e., 43% for foster youth and 42% for comparison students), and the differences in yearly totals were most likely due to variation in school grade range.

CST patterns

Foster youth were matched very closely to comparison students on a number of important demographic and education variables, including CST level the year prior to entry into out-of-home placement (i.e., baseline year). Figure 2 depicts mean English and math CST levels from baseline to Year 3 for foster youth and comparison students.

The mean baseline CST levels corresponded to midway between the below basic and basic for both English and math. In English, the comparison group increased slightly in level from baseline to Year 3. For foster youth, there was a slight decrease between baseline and Year 1 and an increase in mean CST level between Year 1 and Year 2. Unlike the general upward trend of English CST levels, both groups had a downward trend in math scores. After an increase between baseline and Year 1, the mean math CST level decreased from Year 1 to Year 3 for comparison students. For foster youth, the mean math CST level had a downward trajectory from baseline to Year 3.

Figure 2: Foster Youth/Comparison Sample, English and Math Mean CST Levels, Baseline to Year 3
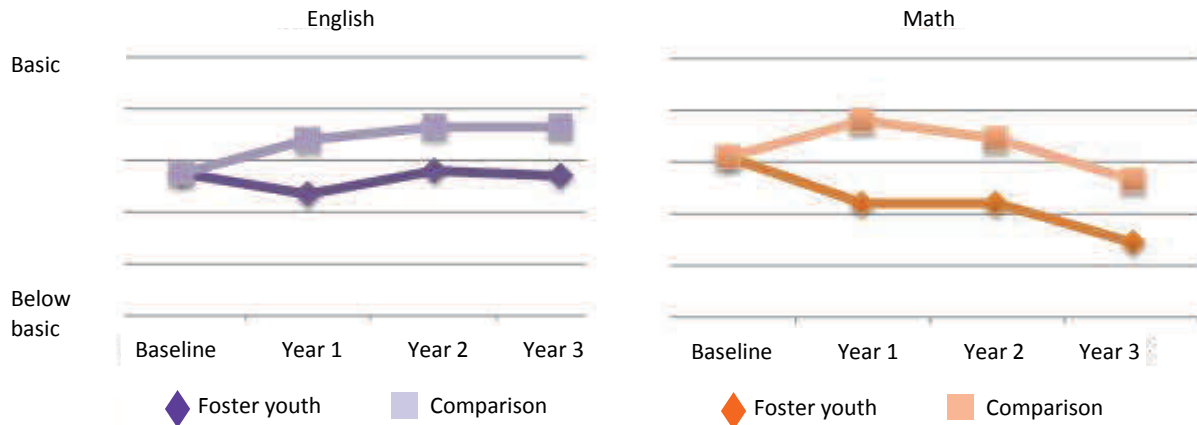
Table 1 provides a more in-depth descriptive investigation of foster youth and comparison student change in English and math CST levels from baseline to Year 3 by baseline CST level. The four levels of change include no change, intermediate change, increase, and decrease. No change signals that the CST level remained the same from baseline to Year 3.[1] An intermediate change indicates that while the CST level was the same at baseline and Year 3, the student changed levels in either Year 1 or 2. The final two categories denote that in relation to the baseline level, a student either increased (e.g., moved from basic to proficient) or decreased (e.g., moved from proficient to basic) in Year 3.

Table 1: Foster Youth and Comparison Groups, Change in English and Math CST Patterns by Baseline Level to Year 3

English					Math				
CST Baseline Level	Year 3 Level				CST Baseline Level	Year 3 Level			
	No Change	Inter. Change	Increase	Decrease		No Change	Inter. Change	Increase	Decrease
Foster youth	%				Foster youth	%			
Far below basic	31*	18	51	0	Far below basic	26*	26	48*	0
Below basic	15	29	31*	25*	Below basic	17	31	17*	34*
Basic	19	30	18*	33*	Basic	9	24	11*	55*
Proficient/ Advanced	42*	18	0	40*	Proficient/ Advanced	25*	13	0	63*
Comparison					Comparison				
Far below basic	22*	21	56	0	Far below basic	18*	26	56*	0
Below basic	12	27	43*	18*	Below basic	16	29	31*	24*
Basic	22	29	26*	22*	Basic	9	26	19*	46*
Proficient/ Advanced	58*	16	0	27*	Proficient/ Advanced	42*	10	0	48*

* Significant difference between foster youth and comparison group.
Note: Percentages added across rows may not total 100% due to rounding.

In English, approximately half of all youth who scored at the far below basic level in the baseline year increased in CST level by Year 3. A significantly higher proportion of foster youth did not change levels compared to the comparison group (31% vs. 22%). Fewer foster youth who started at the below basic level increased (31% vs. 43%) performance levels and a greater number decreased (25% vs. 18%) in relation to comparison students. For foster youth who scored at the basic level at the baseline year, a higher percentage decreased (33% vs. 22%) and a lower proportion achieved proficiency by Year 3 (18% vs. 26%). Lastly, the majority of all students who scored at the proficient level at baseline retained this status (either no change or an intermediate change) by Year 3 (60% of foster youth and 74% of comparison students), although a significantly higher proportion of foster youth decreased to a lower level compared to the matched group (40% vs. 27%).

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[1] Note that students in the far below basic category at baseline could not decrease over time and those in the proficient/advanced category at baseline could not increase. Interpretations of proficiency movement should focus on comparisons between foster youth and matched nonfoster youth comparison groups.

Overall, similar proportions of foster and comparison students remained at the same CST level (25% vs. 27%) or had an intermediate change (25% vs. 24%) between baseline and Year 3. Approximately half of all students retained the same CST level from baseline to Year 3. Compared to the matched students, a significantly lower percentage of foster youth changed to a higher CST level (24% vs.31%) and a significantly higher proportion decreased in level (26% vs. 18%) during the study years.

For youth who scored at the far below basic level at baseline in math, a significantly higher proportion of foster youth consistently remained at this level (26% vs. 18%) and a lower percentage moved to a higher level (48% vs. 56%) compared to the matched and/or comparison group. A lower proportion of foster youth at the below basic level at baseline increased (17% vs. 31%) and a higher percentage decreased to the far below basic level in relation to nonfoster youth (34% vs. 24%). Compared to all the baseline levels, significantly fewer students who scored at the basic level remained consistently at this level over time. In relation to the comparison students, a lower percentage of foster youth increased (11% vs. 19%) and a higher percentage deceased (55% vs. 46%) by Year 3. Of the youth who achieved proficiency at baseline, fewer foster youth remained at the same level (25% vs. 42%) and a higher percent decreased in level (63% vs. 48%) in relation to the comparison sample at Year 3.

While similar patterns are seen in the math sample, overall a greater number of students changed in CST level from baseline to Year 3. The percentage of foster youth and comparison students who remained constant (18% vs. 21%) or experienced an intermediate change (24% vs. 23%) in math CST level was similar. Significantly fewer foster youth experienced an increase in level (16% vs. 28%) and a greater number experienced a decrease in CST level (42% vs. 28%) compared to the matched students.

CST level trends

In order to further understand how foster youth fared in relation to closely matched nonfoster youth, more complex statistical analyses were performed. The purpose of these analyses was to examine whether differences in foster youth and comparison youth CST level trends were maintained after controlling for various at-risk characteristics (e.g., race, special education status, school quality). For both the English and math samples, the far below basic category was used as the reference category.

In English, foster youth were 21% less likely to be in the basic group and 34% less likely to be proficient compared to the comparison group.[2] In math, foster youth status was a significant predictor in all three categories. Foster youth were 21% less likely to be in the below basic category, 31% less likely to be in the basic category, and 49% less likely to be proficient in math compared to the matched comparison students.

Foster youth who experienced a school transfer during Year 1 were 18% less likely than those who didn't experience a transfer to be in the basic group and 22% less likely to be in the proficient group rather than in the far below basic group.

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[2] To ease interpretation, logit coefficients found in the Tables Appendix were converted to relative risk estimates as follows: 1-exp (coefficient).

Foster Youth Samples: Education and Child Welfare Characteristics

In order to provide preliminary insight about differences in education and child welfare characteristics among foster youth CST levels, the following section outlines differences in proportions among the CST level groups the year prior to entry into out-of-home placement (i.e., baseline).

Figure 3 depicts significant differences in selected education and child welfare proportions between the far below basic and proficient groups at baseline in English and math. The far below basic group had significantly lower proportions of White/Asian (16%) students compared to the proficient group (35–38%).[3] Higher proportions of Black (30–35%) and Hispanic (49–53%) students scored at the far below basic level and significantly lower proportions were proficient on the CST at baseline.

There were significant differences in education at-risk variables between the far below basic and proficient levels. In the far below basic group, 77–79% participated in the NSLP, 29–32% were designated as ELL, and between 33–36% had a documented disability. In the proficient group, 68–71% participated in the NSLP, 16–22% were ELL, and only 8% had a documented disability.

Figure 3: Significant Differences in Proportions of Selected Education and Child Welfare Variables between the Far Below Basic and Proficient Groups at Baseline in English and Math
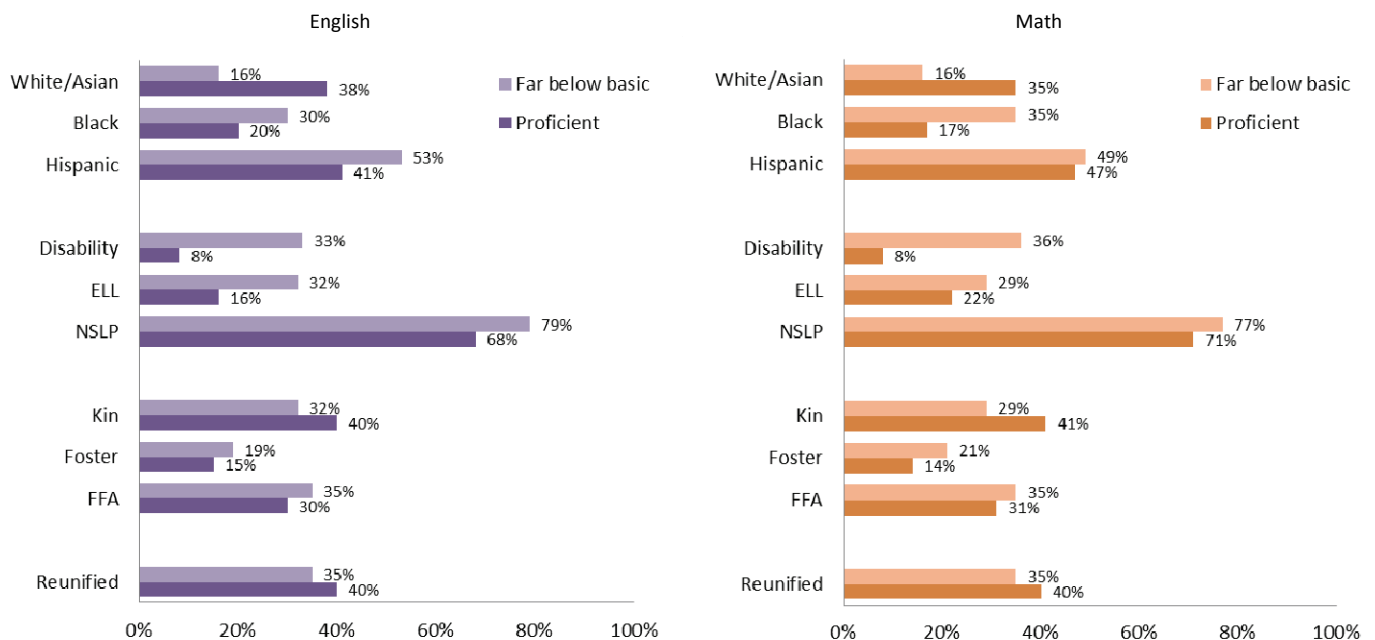
There were some differences in the two subject areas in terms of child welfare placement and exit variables. Larger proportions of foster youth in the proficient group spent the majority of their time in foster care placed in a kin home (40–41%) compared to the far below basic group. Significantly larger proportions of youth placed in foster family homes or placed through Foster Family Agencies (FFA) were found in the far below basic group. Lastly, higher proportions of youth who reunified with family by the end of Year 3 were proficient at baseline (40%) compared to the proportion in the far below basic group (35%).

[3] The study combined White/Asian ethnicity categories as these groups were not considered "at risk."

Education and child welfare characteristics associated with CST level trends

Using far below basic as the reference group, the study investigated which characteristics were associated with trends in foster youth CST levels. The following section primarily highlights common education and child welfare factors in English and math associated with foster youth CST performance over time.[4]

There were significant differences among foster youth of different ethnicities. Black and Hispanic foster youth were less likely to be in the higher performance categories compared to White/Asian foster youth and were more likely to be in the lowest performance level, far below basic. For example, compared to White/Asian foster youth, Black students were 63–66% less likely to be at the below basic, 79–80% less likely to be in the basic group, and 78% less likely to be proficient in English or math. Likewise in English, Hispanic youth were 18% less likely to be below basic, 19% less likely to be basic, and 33% less likely to be CST proficient compared to White/Asian foster youth.

Several education variables present at baseline were associated with CST level trends, including participation in NSLP, being designated ELL, or having a disability. Overall, higher level CST groups were primarily characterized by the absence of these education at-risk factors. Compared to youth in the far below basic group, those in the below basic group were more than 22% less likely to participate in the NSLP, 27–37% less likely to be an ELL student, and more than 79% less likely to have a documented disability. Students in the basic group were more than 33% less likely to participate in the NSLP, 38–50% less likely to be ELL, and more than 88% less likely to have a documented disability. Foster youth who achieved proficiency were 43–48% less likely to be in the NSLP, more than 45% less likely to be an ELL student, and 88–94% less likely to have a documented disability.

Significant child welfare predictors included major placement type, exit type, and reentry.

Foster youth placed through an FFA or in a county foster home were less likely than those placed with kin to be in the higher performing groups (below basic, basic, and proficient) and more likely to be in the far below basic category on the English and math CSTs. Specifically, foster youth placed through an FFA were 19–23% less likely than those placed with kin to be in the below basic group, 28–29% less likely to be in the basic group, and 34–37% less likely to be a member of the proficient group. Foster youth placed in a county foster home were 24% less likely than those placed with kin to be in the below basic group, 31–33% less likely to be in the basic group, and 33–40% less likely to be in the proficient group. Meanwhile, youth in a group home were more than 28% more likely to be in higher level CST groups compared to those placed with kin.

The way a foster youth exited the system was also related to educational outcomes, but differed by subject. For example, reunified youth were more than 31% more likely to be below basic, basic, or proficient in English than youth who did not exit foster care by Year 3, and therefore, less likely to be in the far below basic category. In math however, students who reunified were approximately 20% less likely to be in the basic or proficient groups than those who had exited care.

Reentry into foster care was related to lower levels of achievement. Foster youth who reentered foster care in Years 1 or 2 were 19% less likely to be in the below basic group and 25% less likely to be in the basic or proficient group and more likely to be far below basic on the English CST (and therefore more likely to be

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[4] For more information on characteristic definition or timing of variables, please see the Technical Appendix.

in the far below basic category) than foster youth who did not reenter. Further, youth who reentered were 28% less likely to be at the basic level and 35% less likely to be proficient in math than youth who did not reenter.

One variable that was not a consistent significant predictor of CST level trends was school quality. Attempts to collapse the variable into a dichotomous measure (i.e., poor quality versus higher quality) were thwarted due to collinearity. In a separate investigation, school quality with four levels of ranking was used as the outcome variable.[5] Several trends emerged, though not all results achieved significance. In general, youth who had higher CST levels at baseline were more likely to be in higher quality schools. For example, foster youth who were proficient in English at baseline rather than far below basic were 19% more likely to be in an excellent quality school compared to a poor quality school. In addition, students who transferred schools in Year 1 were more likely to be in higher quality schools. In English, youth who transferred schools in Year 1 (compared to those who didn't) were 24–26% more likely to be in higher quality schools.

Finally, the time variant predictors (e.g., school transfer, placement change) in Years 1 and 2 produced few uniform trends. Analyses were rerun with the variable change (the sum of the five time variables by year) substituted for the actual variables. Results indicated that a one unit increase in the variable change was associated with a more than 10–15% decrease in being in the higher level CST groups compared to the far below basic group. In other words, students in higher CST groups were significantly less likely to experience multiple residential and school changes in the same year.

Discussion

Foster youth were matched in the analyses very closely to comparison students by a number of key demographic and education variables, including CST level the year prior to entry into out-of-home placement. Results indicated that compared to their peers, foster youth were less likely to perform at higher CST levels over time. Part of the variance in levels was associated with foster youth school transfers. Three out of four (75%) foster youth experienced a school transfer in the year they entered foster care compared to 21% of the comparison group. For foster youth, changing schools was a significant predictor of CST levels over time. Findings were consistent with past research, which noted the high level of school changes at entry to foster care[iv] and the negative association with academic performance.[v]

While there were differences in CST level trends between foster youth and the comparison group, the proportion of students in this study who achieved proficiency on the English or math CST at baseline was significantly lower than that of the general student population. In English, 21% of foster youth achieved proficiency compared to approximately 40% of California students.[6] In math, while 46% of the general population performed at the proficient level, only 25% of the foster students in the study achieved this goal.

While both education and child welfare characteristics were associated with performance, education risks present prior to entry into foster care were more reliable predictors of CST level trends. Past research indicated that foster youth are more likely to be poor,[vi] non-White,[vii] and have disabilities (i.e., special

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[5] The 10 initial ranks were collapsed into four levels for matching purposes and analyses as follows: schools receiving a rank between one and three were defined as poor; schools with a rank of four or five were defined as average; those between six and eight were defined as good; and schools with a rank of nine or 10 were defined as excellent.
[6] Based on data from CDE for students in the same grade and years as foster youth at baseline.

education status).[viii] Much like other at-risk students, foster youth who are non-White/Asian, participate in the NSLP, are designated as ELL, or have a documented disability are significantly less likely to perform well on standardized tests. Low-performing CST level groups are consistently characterized by an increase in educational risk, which is consistent with past research regarding at-risk populations.[ix] Although foster youth represent a small percentage of the student population, educationally they become a concentrated underachieving group. Findings underscore the need to identify subgroups of vulnerable youth with the greatest need for additional educational support.

In particular, foster youth with a documented disability (i.e., special education) are at increased risk for poor performance over time. Similar to other at-risk populations,[x] foster youth are disproportionately classified with a documented disability.[xi] In California, approximately 9% of students in grades two through seven[xii] receive special education services compared to 15% of foster youth in this study. In general, students with a documented disability tend to fare poorly on both the ELA and math portions of the CST. In 2011, 32–39% achieved proficiency or above on the English and math tests compared to 58–64% of students without a documented disability.[xiii] Of all the groups identified as at-risk, students with a documented disability appear to struggle the most with standardized academic tests.

While in past research the authors found that a decrease in academic performance was associated with foster youth who attended poor quality schools,[xiv] the lack of consistent findings in the current research may be due to the categorical division of school rank used. Instead of a dichotomous variable with poor and non-poor quality assessed, four categories—including poor, average, good, and excellent—were included in the models due to extreme collinearity. Much like previous research,[xv] the majority of foster youth in this study attended poor quality schools at baseline. In a separate investigation with the four school quality categories as the nominal outcome, findings indicated that school quality was associated with CST level at baseline and school movement. These findings suggested that youth who attend a poor quality school are less likely to perform well on the CST at baseline or transfer schools in the same year they enter foster care.

The association among school quality, placement changes, school transfers, and academic performance is complex. While remaining in the same school appears to have potential benefits for some students, it may not support the educational best interest for many foster youth.[xvi] Remaining in the same school after entry into foster care may mitigate the number of changes a youth experiences. However, having foster students remain in low performing schools may impede long-term academic achievement. Future research that includes a more refined measure of school quality will help to unravel the association of school quality, residential and school movement, and academic outcomes for foster youth.

This research found improved performance in English and math for youth who spent the majority of time placed in kin homes compared to placement in foster family homes or FFAs. This finding echoes previous research that found that foster youth placed with kin had higher third grade reading scores compared to other placement types.[xvii] However, these findings may reflect a placement selection bias. Grogan-Kaylor (2000)[xiii] found that youth placed with kin were more likely to be non-White and removed due to neglect, and less likely to have health problems or come from a low socioeconomic status household (i.e., on welfare), indicating that youth placed with kin have fewer education risks prior to entry into out-of-home placement.

Findings suggested improved performance in English and math for youth who spend the majority of time in a group home compared to kin homes. Yet in previous research focused on foster youth high school and college outcomes,[xix] the authors found that youth who spent the majority of time in group home placements had worse outcomes than youth placed with kin. While youth were followed for three years post entry into foster care, more time may be needed to understand how group home placement is associated with long-term educational success. Future research that follows youth over longer periods of time and explores details of kin placement or group home placement may be needed to understand the association between group home placement and academic performance.

Students still in foster care at the end of the study years were more likely than students who had reunified to have higher levels of proficiency on the English CST, but lower levels of proficiency in math. This discrepancy was likely due to a sample bias. While previous research that has investigated academic performance by exit type outside of emancipation is scarce, the few studies that pertained to this age group[xx] indicated that youth who are Black,[xxi] are from low socioeconomic families,[xxii] or have physical disabilities[xxiii] are less likely to exit via reunification. In this study, the degree of overlap between the English and math samples was very high (98–99%). Therefore, these past findings were most likely due to a sample bias, wherein the youth who reunified were more competent in English, rather than demographic characteristics found in other research.

Lastly, findings indicated that the number of school and residential changes a foster youth experiences in the year they enter foster care is associated with academic performance. Compared to youth in the far below basic level, an increase in the number of changes in Year 1 was associated with a decreased likelihood of being in a higher level CST group. Akin to previous research,[xxiv] findings suggested that the number of residential and school changes a student faces may alter successful adaptation and signal a shift in academic performance trajectories.

In conclusion, findings indicated that foster youth are less likely to have higher levels of proficiency on the CST compared to nonfoster youth, and foster youth are less likely to increase their CST performance over time compared to nonfoster youth. For foster youth, education at-risk factors present prior to entry into foster care placement were more reliable predictors of academic performance over time than the majority of child welfare case characteristics. Findings also indicated that school and residential changes are associated with lower academic performance. These findings can inform current policy and practice and identify avenues for further research, specifically regarding school quality and group home placements and their relationship to student outcomes.

Endnotes

i. Needell, B., Webster, D., Armijo, M., Lee, S., Dawson, W., Magruder, J., Exel, M., Cuccaro-Alamin, S., Putnam-Hornstein, E., Williams, D., Simon, V., Hamilton, D., Lou, C., Peng, C., Moore, M., King, B., Henry, C., & Nuttbrock, A. (2012). *Child Welfare Services Reports for California*. Retrieved 9/5/2012, from University of California, Berkeley, Center for Social Services Research website. URL: <http://cssr.berkeley.edu/ucb_childwelfare>

ii. Ireland, T., Smith, C., & Thornberry, T. (2002). Developmental issues in the impact of child maltreatment on later delinquency and drug use. *Criminology,* 40(2), 359–400; Leiter, J., & Johnson, M. (1994). Child maltreatment and school performance. *American Journal of Education,* 102(2), 154–189; Wheaton, B., & Gotlib, I. (1997). Trajectories and turning points over the life course: Concepts and themes. In B. Wheaton & I. Gotlib (Eds.), *Stress and Adversity Over the Life Course: Trajectories and Turning Points* (pp. 1–25). Cambridge: Cambridge University Press.

iii. Burley, M., & Halpern, M. (2001). *Educational Attainment of Foster Youth: Achievement and Graduation Outcomes for Children in State Care*. Olympia, WA: Washington State Institute for Public Policy; Conger, D., & Rebeck, A. (2001). *How Children's Foster Care Experiences Affect their Education*. New York, NY: New York City Administration for Children's Services; Smithgall, C., Gladden, R., Howard, E., Goerge, R., & Courtney, M. (2004). *Educational Experiences of Children in Out-of-home Care*. Chicago, IL: Chapin Hall Center for Children at the University of Chicago.

iv. Smithgall, C., et al, op. cit.; Burley, M., & Halpern, M. (2001). *Educational Attainment of Foster Youth: Achievement and Graduation Outcomes for Children in State Care*. Olympia, WA: Washington State Institute for Public Policy.

v. Eckenrode, J., Rowe, E., Laird, M., & Brathwaite, J. (1995). Mobility as a mediator of the effects of child maltreatment on academic performance. *Child Development,* 66(4), 1130–1142; De Bellis, M. (2001). Developmental traumatology: The psychobiological development of maltreated children and its implications for research, treatment, and policy. *Development and Psychopathology,* 13, 539–564.

vi. Barnettt, D., Vondra, J., & Shonk, S. (1996). Self-perceptions, motivation, and school functioning of low-income maltreated and comparison children. *Child Abuse and Neglect*, 20(5), 397–410; Duncan, G. J., & Magnuson, K. A. (2005). Can family socioeconomic resources account for racial and ethnic test score gaps? *Future of Children*, 15(1), 35–54; Leiter, J., & Johnson, M., op. cit.

vii. Hill, R. B. (2006). *Synthesis of research and disproportionality in child welfare: An Update.* Casey-SCCP alliance for racial equity in child welfare system. Retrieved January 2, 2008, available from http://www.cssp.org/major_initiatives/ racialEquity.html

viii. Wulczyn, F., Smithgall, C. and Chen L. (2009). Child Well-Being: The Intersection of Schools and Child Welfare. In *Review of Research in Education: Risk, Schooling, and Equity*. Eds. Gadsden, V., Davis, J. E., Artiles, A. J. Vol 33, 35–62.

ix. Abbott, M., Hart, C., Lybrand, J., & Nouri, L. (2009). *The relationships among achievement, low income, and ethnicity in Washington State—A second look*. Seattle: Washington School Research Center; Crozier, J., & Barth, R. (2005). Cognitive and academic functioning in maltreated children. *Children and Schools,* 27(4), 197–206; Lee, V., & Burkham, D. (2008). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Economic Policy Institute: University of Michigan; Wight, V., Chau, M., & Aratani, Y. (2011). *Who are American's poor children? The official story*. New York: National Center for Children in Poverty: Columbia University, Mailman School of Public Health.

x. Artiles, A., Rueda, R., Salazar, J., & Higareda, I. (2005). Within-group diversity in minority disproportional representation: English language learners in urban school districts. *Exceptional Children* 71(3), 283–300; Oswald, D., Coutinho, M., Best, A., & Singh, N. (1999). Ethnic representation in special education: The influence of school-related economic and demographic variables. *Journal of Special Education,* 32, 194–206.

xi. Burns, B., Phillips, S., Wagner, R., Barth, R., Kolko, D., Campbell, Y., & Landsverk, J. (2004). Mental health need and access to mental health services by youths involved with child welfare: A national survey. *American Academy of Child and Adolescent Psychiatry,* 43(8), 960–970; Wulczyn, F., Barth, R., Yuan, Y., Harden, B., & Landsverk, J. (2005). *Beyond Common Sense: Child Welfare, Child Well-being, and the Evidence for Policy Reform*. New Brunswick, NJ: Aldine Transaction.

xii.   CDE DataQuest website, http://dq.cde.ca.gov/dataquest/

xiii.   CDE STAR website, http://star.cde.ca.gov/star2011/ViewReport.aspx?ps=true&lstTestYear =2011&lstTestType=C&lstCounty=&lstDistrict=&lstSchool=&lstGroup=2&lstSubGroup=99

xiv.   Frerer, K., & Sosenko Davis, L. (2011). *First Look, Foster Youth Education Outcomes in Four California Counties.* Stuart Foundation. http://www.stuartfoundation.org/Files/FirstLook_FullReport_Nov2011.pdf

xv.   Smithgall, C., et al., op. cit.; Frerer, K., & Sosenko Davis, L., op. cit.

xvi.   Berrick, J. (December 2006) A Critical Examination of Location-Based Placement Criteria. *Social Services Review.* Vol 80, No. 4, pp. 569–583.

xvii.   Smithgall, C., et al., op. cit.

xviii. Grogan-Kaylor, A. (2000). Who goes into kinship care? The relationship of child and family characteristics to placement into kinship foster care. *Social Work Research,* 24(3), 132–141.

xix.   Frerer, K., & Sosenko Davis, L., op. cit.

xx.   Taussig, H., Clyman, R., & Landsverk, J. (2001). Children who return home from foster care: A 6-year prospective study of behavioral health outcomes in adolescence. *Pediatrics,* 108, 10–17.; Frerer, K. (2011). An Exploration of Foster Youth Academic Performance Trajectories and Predictors of Group Membership: U.C. Berkeley.

xxi.   Wulczyn, F., Brunner, K., & Goerge, R. (2000). *An update from the multistate foster care archive: Foster care dynamics 1983–1998.* Chicago: Chapin Hall Center for Children at the University of Chicago.

xxii.   Kortenkamp, K., Geen, R., & Stagner, M. (2004). The role of welfare and work in predicting foster care reunification rates for children of welfare recipients. *Children and Youth Services Review,* 26, 577–590.

xxiii. McDonald, T., Poertner, J., & Jennings, M. (2007). Permanency for children in foster care. *Journal of Social Science Research,* 33, 45–56.

xxiv.   Simmons, R., Burgeson, R., Carlton-Ford, S., & Blyth, D. (1987). The impact of cumulative change in early adolescence. *Child Development,* 58(5), 1220–1234.

Technical Appendix

Overview

The Stuart Foundation brought together IEBC, the managing agency of the Cal-PASS data system, and the CSSR at the University of California, Berkeley, to conduct a pilot study of the education outcomes of youth who had been placed in foster care between 1998 and 2008 in four California counties. In 2011, the Stuart Foundation published *First Look,* a summary report of the pilot effort. The project set a precedent for Federal Education Rights and Privacy Act (FERPA) compliant data sharing between education and social services agencies.

Since the successful pilot, the project partners moved forward to study foster youth across California, focusing on two areas of interest: 1) high school and college outcomes and 2) how various education and child welfare characteristics influence CST levels over time. The purpose of these investigations was to understand how characteristics of students, their experiences, and their academic performance influence education achievement.

This "Technical Appendix" provides detailed notes about how the analyses were completed for the statewide effort. First, this appendix describes the data sources, the data-linking process, and the comparison group selection. Then the foster youth sampling plan is presented, including details about the weighting process used to represent the state foster youth population with the sample data. The variables in the analyses are defined, and the data preparation tasks are outlined. Common acronyms used in the research summaries and data tables presenting findings complete the appendix information.

Data

This study employed two primary data sources to assess education outcomes for foster youth in California: administrative child welfare records from CWS/CMS and education records from Cal-PASS. Additional data about the schools attended are from the CDE. The sources of data, sample and variable creation, and analyses methods are described below.

Data Sources

Child Welfare Services Case Management System

CWS/CMS is a centralized, statewide child welfare data system in California. Through an Interagency Agreement with CDSS, the CSSR/Children Services Archive at the University of California, Berkeley, receives quarterly extracts of CWS/CMS data.

California Partnership for Achieving Student Success

Cal-PASS is a statewide initiative that collects, analyzes, and shares student data in order to track student performance in more than 56 counties. During the study period, the consortium housed up to 13 years of education data, including data from both elementary/secondary school districts and public postsecondary institutions (California Community Colleges, California State Universities, and the University of California system).

Cal-PASS is a voluntary data-sharing initiative. A majority of Cal-PASS members have joined the initiative within the last five years; therefore, data from the last seven years (2004–05 to 2010–11) are the most robust in the Cal-PASS system. When a district joins Cal-PASS, it is asked to transfer the most recent five years of data to Cal-PASS, although institutions may decide not to transfer all five years of retrospective data or may transfer selected files (either a subset of files or years of data) to the system. Therefore, the education data available for this project varied by content, district, and school year.

California Department of Education

Data from the CDE API provides state rank data as a proxy measure for school quality.

Description of Linking Process/Foster Youth Linked

Youth aged 6 and older with a documented foster placement episode between January 1, 1998, and December 31, 2010, in CWS/CMS were identified from data extracted from the first quarter of 2011 for inclusion in the study. The extract was completed before the January 2012 revision of FERPA. At the time the data were extracted, FERPA specifically forbid sharing information between state agencies that could identify individual students. Therefore, the data merge and the final data set maintained the anonymity of the students.

A unique, nonidentifiable project identification number for each foster youth was created. Sensitive CWS/CMS data, which included first and last names, date of birth, gender, and social security numbers, underwent an encryption process that created a variable that appeared as a string of numbers and letters. Data were encrypted prior to any linkage of records from CWS/CMS and Cal-PASS. The record linkage process used the encrypted data elements in a computer algorithm that evaluated the probability of each linkage according to statistical network properties. A probabilistic method was chosen over exact matching because it had the advantage of linking records in situations where a person's name had changed, a data element was missing, or typographical error had occurred. Upon conclusion of the record linkage process, names and social security numbers were permanently deleted from the data set. Only the unique, nonidentifiable project identification numbers that could not be linked back to either data system remained.

Of the 449,789 unique foster youth identified in CWS/CMS, approximately 242,000 youth were linked to Cal-PASS education data. Table A1 presents general match results. The table includes counts of unique foster youth matched to various Cal-PASS educational files by school level (e.g., K–12, community college).

The Standardized Testing and Reporting (STAR) data file included important educational demographic data such as whether students were designated ELL or participated in the NSLP. Therefore, Table A1 includes the number of unique foster youth with STAR data by educational file. For example, of the 449,789 unique foster youth, 120,815 had course data in grades eight to 12; of those foster youth, 96,821 had STAR educational demographic data.

Table A1: Unique Foster Youth Matched to Cal-PASS Educational Files and STAR Demographic Data by School Level		
Description	Count	Count with STAR
Number of unique foster youth identified from 1998–2010 in CWS/CMS	449,789	146,645
K–12		
California Standards Test (CST): Grades two to 11	142,653	142,653
Course: Grades eight to 12	120,815	96,821
High School Exit Exam (CAHSEE): Grades 10 to 12	43,388	43,387
Award: Grade 12	27,790	20,620
Community College		
Course	63,336	22,717
Award	1,985	365
University		
Course	3,138	1,244
Award	520	53

California Standards Test Levels Over Time

The purpose of this investigation was to understand how various education and child welfare characteristics influenced CST levels over time. In addition to foster youth, this study included comparisons to similar nonfoster youth.

Samples

Foster youth samples

This analysis followed cohorts of foster youth in grades two to seven during school years 2003–04 to 2006–07 for three years post-entry (i.e., baseline year). Only youth with STAR demographic data were identified for inclusion in these analyses. In addition, foster youth must have had a minimum of two years of test scores on the CST, with one of those years at baseline. Two separate samples were extracted for ELA and math. In addition to the two primary samples, foster youth were matched to nonfoster youth students closely at the baseline year.

A large proportion of foster youth overlapped the English and math samples (Table A2).

Table A2: Foster Youth Sample Size and Percent Overlap Between Academic Focus			
Population	Academic Focus	Sample Size	Percent in Alternate Academic Sample*
Foster youth	English	8,523	98
	Math	8,418	99
Matched foster youth	English	4,005	86
	Math	3,936	87
*For example, 98% of the English sample is also in the math sample.			

Foster youth entry and baseline years were assigned based on foster care placement end and start dates in relation to grade level and school year. As schools varied in terms of academic calendar (e.g., when the school year begins, traditional vs. year-round) a guideline for the assignment of foster care entry and baseline years was adopted (Table A3). For this study, the academic year began on September 1 and ended on August 31. For example, if a youth entered foster care between September 1, 2003, and August 31, 2004, the school entry year (Year 1) of 2003/04 was assigned with 2002/03 as the baseline year.

Table A3: School Year and Baseline Year Guidelines		
Placement Episode Entry Date	School Year Entry (Year 1)	Baseline Year Matched
9/1/2003 to 8/31/2004	2003/04	2002/03
9/1/2004 to 8/31/2005	2004/05	2003/04
9/1/2005 to 8/31/2006	2005/06	2004/05
9/1/2006 to 8/31/2007	2006/07	2005/06

Comparison group

In addition to foster youth, education data were extracted for a group of comparison students not identified as having a foster placement episode but who were similar on several demographic and key characteristics. The foster youth samples were matched to comparison students by: grade level, school year, gender, ethnicity, ELL status, NSLP status, primary disability, district or school, state rank, and baseline CST level. In the math sample, foster youth and nonfoster youth were additionally matched by math course level for older youth.

Weighting schema

A weighting formula was utilized to ensure that the samples of students with education data represented the appropriate statewide population. The samples were weighted by gender and ethnicity.

Data Element Definitions

The following section provides detail as to how the study variables were defined and operationalized.

Dependent variables

Variable	Detail
California Standards Test (CST) level	The CST, administered every year for students in grades two to 11, is used to determine how well students have learned specific grade-relevant information. Based on the number of questions answered correctly, students are assigned a scaled score that ranges from 150 to 600. While the scaled scores on the CSTs look similar year to year, they are based on composition of total students who complete the test at each grade level for the testing year and are not vertically scaled (i.e., cannot be used to show growth). At each grade level, topic-specific scaled scores are converted to an aptitude level that includes far below basic, below basic, basic, proficient, and advanced. For analyses, proficient and advanced levels were combined for a total of four levels: far below basic, below basic, basic, and proficient/advanced.

Independent variables

Demographic/Achievement Gap Variables

Variable	Detail
Grade	Based on baseline year, grade levels ranged from second to seventh. For multivariate analyses, the levels were grouped as follows: second–third, fourth–fifth, and sixth–seventh.
Academic year	Academic year pertained to the baseline year for a given grade level cohort. Years ranged from 2002–03 to 2006–07.
Gender	For foster youth, gender (male or female) was based on data from the most recent episode in CWS/CMS. Comparison student gender was from the Cal-PASS STAR data table.
Ethnicity	Ethnicity was based on the student's most recent ethnic category. Foster youth ethnicity was based on data from the most recent episode in CWS/CMS. Comparison student ethnicity was from the Cal-PASS STAR data table. For all students, multiple ethnicity types were collapsed to form four primary categories: 1) White/Asian; 2) Black; 3) Hispanic; 4) Other. (Note: Due to very small numbers of Native American students, this group was included in "Other").
National School Lunch Program (NSLP)	As a proxy for socioeconomic status, participation in the NSLP (i.e., receiving free or reduced-price lunch) was included. Eligibility for the program is based on the official federal poverty guidelines. To qualify, family income must be at or below 185% of the current poverty guideline. Participation is based on baseline year (i.e., for the second grade cohort, NSLP status in second grade was used).

Variable	Detail
English Language Learner (ELL)	ELL status is established by the school. When students are enrolled in school, parents or guardians fill out a Home Language Survey indicating whether English is the primary language. If another language is indicated, students complete the California English Language Development Test (CELDT). The test is administered annually for students classified as ELLs. Based on the above information, students were classified in one of four categories. These categories were condensed as follows: students with English as the primary language included English only and initially fluent English proficient. These students were coded "0." English learner and reclassified fluent English proficient were coded "1." Participation was based on baseline year (i.e., for the second grade cohort, ELL status in second grade was used).
Disability	The designation of a primary disability is based on a professional assessment and a student-specific Individualized Education Plan (IEP). Students are reassessed at least every three years to determine whether special education services continue to be needed. In this study, the various categories of primary disability (e.g., speech language impairment, specific learning disability, emotional disturbance) were collapsed into a "yes." Participation was based on baseline year (i.e., for the second grade cohort, disability status in second grade was used).
School quality	This study utilized a condensed scale of the California Statewide Rank (or state rank) as a proxy for school quality. State rank is based on the API, which measures school performance. API is calculated by converting student performance on statewide assessment tests into points on the API scale and then averaged by school. All schools that receive an API are ranked in deciles by school type based on grade level of instruction, with a rank of 10 being the highest and one the lowest (i.e., poor quality school). State rank is school-year specific (http://www.cde.ca.gov/ta/ac/ap/ documents/infoguide09.pdf). The 10 initial ranks were collapsed into four levels for matching purposes and analyses as follows: schools receiving a rank between one and three were defined as poor, schools with a rank of four or five were defined as average, those between six and eight were defined as good, and schools with a rank of nine or 10 were defined as excellent.

Child Welfare Variables

Variable	Detail
Foster youth	In analyses where foster youth were matched closely to nonfoster youth, an indicator variable was created for foster youth status.
Removal reason	The primary removal reason was based on the severity of maltreatment. The hierarchy was as follows: sexual abuse, physical abuse, neglect, and other. For example, if reasons of neglect and sexual abuse were indicated, the primary removal reason would be coded as sexual abuse. The categories of removal reason were based on the most recent foster care placement episode and were defined as follows: 1) neglect (e.g., severe caretaker incapacity; 2) physical abuse; 3) sexual abuse; 4) other (e.g., emotional abuse).
Spells	Each time a youth entered a specific foster care placement episode, a "spell" count was created. The spell continued until an exit from foster care placement was recorded. We differentiated between first spell and two or more spells.
Major placement type	Major placement type was based on time spent during the study years. Length of stay in days was calculated for each placement type and summed across three years. The type of placement in which a foster youth spent the most number of days was deemed the major placement type. Categories included: 1) kin; 2) FFA; 3) foster family home; 4) group or residential placements; 5) other (e.g., medical, detention center).
Exit type	Exit type was based on how youth exited care during the study years. Categories included: 1) no exit reason (still in care by end of Year 3); 2) reunification; 3) other (e.g., adoption, legal guardianship).

Time Variant Variables

Variable	Detail
School normative transition Year 1/Year 2	Normative school transition was based on type of school attended. School type was obtained by linking a unique school identification number present in the data set to CDE data. The Year 1 variable indicated a school transition between the baseline and Year 1 school years. Year 2 included a change from Year 1 to Year 2. For example, if type of school at baseline was elementary and Year 1 type was middle school, then a normative school transition was indicated as "1" for Year 1. If there was no change in school type from baseline to Year 1, a "0" was coded.
School non-normative transfer Year 1/Year 2	Non-normative school transfer was based on a unique school identifier and school type. School type was obtained by linking a unique school identification number present in the data set to CDE data. As school data are reported primarily once a year, it was not possible to identify the number of school transfers in a given year. The Year 1 variable indicated a school transfer between the baseline and Year 1 school years. Year 2 included a change from Year 1 to Year 2. For example, if a student attended an elementary school at baseline and at Year 1 attended a different elementary school, a non-normative school transfer was indicated as "1" for Year 1. If there was no change in school name or type, a "0" was recorded.
Placement change Year 1/Year 2	Placement change was based on out-of-home placement start and end dates. Variables included changes in Year 1 and Year 2. As all foster youth entered an out-of-home placement in Year 1, the Year 1 variable only included additional changes in placement. Categories included: 1) no changes; 2) one or more changes.
Exit from foster care Year 1/Year 2	Foster care exits were based on placement episode end dates. For youth who exited foster care during Year 1 or Year 2, a "1" was recorded.
Reentry Year 1/Year 2	Based on placement episode end dates and subsequent start dates, reentry encompassed youth who exited and then reentered foster care in Year 1 or Year 2. Reentry into foster care placement, initially conceptualized as a time variant predictor, was collapsed due to low cell size.
Change Year 1/Year 2	Change was the sum of school transfer, school transition, placement change, exit from foster care, and reentry.

Analyses

Analyses included sample means and proportions for all education, demographic, and child welfare case characteristics. Differences in the means and proportions were calculated among groups. In addition, longitudinal multinomial regression models were employed to examine whether differences in education outcomes among groups were maintained after controlling for various characteristics.

Imputation

While each youth had baseline and one additional year of CST data, there were instances of missing values for Years 1 to 3. In order to include as many youth as possible, missing values were multiply imputed using PROC MI in SAS, version 9.2, as outlined by Yuan.[Ai] As each youth had an initial baseline CST score, a monotone missing data pattern was assumed. Missing values were replaced with a set of possible values in five generated data sets. The same process was used to impute school rank when it was missing.

The five imputed data sets were analyzed in STATA, version 9.1. Two separate methods of analyses were investigated using the English foster youth sample. In the first method, each of the imputed data sets was analyzed separately and the estimates combined to generate a single set of estimates.[A2] For the second method, a mean was calculated from the imputed data sets and analyzed. As there were no significant differences in the two approaches, multivariate analyses included the second method.

Multivariate analyses

All multivariate analyses were performed with STATA, version 9.1. CST levels, while ordinal in nature, were treated as nominal due to violation of the proportional odds assumption. This stance assumed that the relationship between each group of outcomes was the same and provided a single parameter to predict the probability of the response variable being in a higher compared to lower category as each explanatory variable changed.[A3] For example, the independent variable coefficients (e.g., special education status) that described the relationship between CST level far below basic and below basic were the same as basic and proficient. The proportional odds assumption was tested and the p-value was significant. Therefore, combining the parameters for the explanatory variables was rejected and CST levels were treated as nominal.

Multivariate analysis of variance (MANOVA) for all samples was utilized to gain preliminary insight as to differences in education and child welfare characteristics among CST levels. These analyses investigated differences in proportions among the CST level groups the year prior to entry into out-of-home placement (i.e., baseline).

GLLAMM, a generalized linear mixed model program designed for multilevel data,[A4] was utilized to investigate covariates and their relationship to CST levels over time. Level 1 included repeated measures of CST levels with Level 2 reflecting unique students. Analyses paired each response category with an arbitrary baseline category and investigated CST levels over time after controlling for covariates. In our analysis, the response had four levels or states ($J = 4$): Far below basic ($j = 1$), below basic ($j = 2$), basic ($j = 3$), and proficient/advanced ($j = 4$). Far below basic was set as the reference category so that $\beta_1 = 0$.

In models, an individual-specific random effect was introduced (also known as random intercept). The regression coefficients were assumed to be constant for all individuals i and different waves t in CST level j. However, each individual i was then considered as a cluster of observations over time (t = B, 1, 2, 3) and a random intercept was introduced to account for any potential unobserved or false heterogeneity among individuals. In this model, the overall level of the response was allowed to vary over clusters after controlling for covariates.

Lastly, in the foster youth and comparison samples, a random coefficient or slope model was introduced to investigate differences in CST level trends by foster youth status. These analyses assumed that each student had an intercept and slope that characterized a subject-specific trajectory. The intent was to investigate differences in CST level trends by foster care status.

Limitations

As with any research endeavor, this study had limitations. Data for youth with a documented foster care placement were extracted from the CWS/CMS data system. While we can say with some certainty that comparison students were not in foster care in California, we do not know if these students were the subject of a child maltreatment investigation.

As the two primary data sets involved in the project were administrative, the type of information included in the analyses was limited. Neither data set held information about mental or physical health or family background characteristics. Additionally, no information about attendance, suspension, or drop-out status was available. Due to stipulations in FERPA, the data set was anonymous. This limited the ability to update information, explore outcomes in a qualitative manner, or link to other data sets.

For the analyses, only students with demographic and education data were included. The education data were limited to districts in the Cal-PASS data system. This limited the foster youth, comparison, and general population samples to students who attended schools with available data. While the foster youth and comparison samples were weighted to mimic the specific state population, the challenge of selection bias remained. Lastly, while we included general population estimates for the purpose of comparison, this population sample was not weighted or used in multivariate analyses; therefore, results should be interpreted with caution.

Acronyms and Definitions

API: Academic Performance Index—Calculated by CDE, the API is a single number—ranging from a low of 200 to a high of 1,000—that reflects a school's or a subgroup's performance level based on the results of statewide testing. The API is calculated by converting a student's performance on statewide assessments across multiple content areas into points on the API scale. These points are then averaged across all students and all tests. Its purpose is to measure the academic performance and growth of schools. http://www.cde.ca.gov/ta/ac/ap/

Cal-PASS: California Partnership for Achieving Student Success—Cal-PASS is a voluntary consortium consisting of a collaboration of more than 8,000 K–16 institutions throughout California. Educational institutions voluntarily agree to upload data into the Cal-PASS data bank and designate the terms under which the data can be shared. http://www.cal-pass.org/. Through the period of this study, Cal-PASS was administered and managed by the Institute for Evidence-Based Change (IEBC).

CDE: California Department of Education—The CDE oversees the state's K–12 public school system and is responsible for the education of more than 7 million children and young adults in more than 9,000 schools. The CDE is responsible for enforcing education law and regulations. http://www.cde.ca.gov/index.asp

CDSS: California Department of Social Services—The CDSS is responsible for the oversight and administration of programs serving California's most vulnerable residents, including the Children and Family Services Division (i.e., child welfare services, child abuse prevention, foster care, and adoptions). http://www.dss.cahwnet.gov/cdssweb/default.htm

CELDT: California English Language Development Test—The CELDT is a required state test for English language proficiency that is given to students whose primary language is other than English. Students (in kindergarten through grade 12) whose primary language is not English, based on the Home Language Survey (HLS), take the CELDT within 30 calendar days after they are enrolled in a California public school for the first time to determine if they are English learners. http://www.cde.ca.gov/ta/tg/el/

CSSR: Center for Social Services Research—Located at the University of California, Berkeley, School of Social Welfare, the CSSR conducts research, policy analysis and program planning, and evaluation. http://cssr.berkeley.edu/

CST: California Standards Test—Developed by the CDE, the CST(s) measure students' progress toward achieving state age- and grade-specific content standards. Students in grades two through 11 take a variety of subject-specific tests, including English language arts and math. http://www.startest.org/cst.html

CWS/CMS: Child Welfare Services Case Management System—CWS/CMS is the California State administrative data system for the Child Welfare System of services. http://www.hwcws.cahwnet.gov/

ELL: English Language Learner—An ELL is a K–12 student who, based on objective assessment, has not developed listening, speaking, reading, and writing proficiencies in English sufficient for participation in the regular school program. See **CELDT.**

FERPA: Federal Educational Rights and Privacy Act—FERPA (20 U.S.C. § 1232g; 34 CFR Part 99) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under the U.S. Department of Education. http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

IEBC: Institute for Evidence-Based Change—IEBC is a national nonprofit organization committed to effective data use and collaboration among education's stakeholders. Created by the founders of Cal-PASS, IEBC helps education stakeholders use data to make informed decisions, improve practice, and increase student success. http://www.iebcnow.org

IEP: Individualized Education Plan—In the United States, the Individuals with Disabilities Education Act (IDEA) requires public schools to develop an IEP for every student with a disability who is found to meet the federal and state requirements for special education. The IEP describes specifics as to how the educational program designed will meet that child's unique needs.

NSLP: National School Lunch Program—The NSLP, established in 1946, is a federally assisted meal program operating in public and nonprofit private schools and residential child care institutions. It provides low-cost or free lunches to children each school day. http://www.fns.usda.gov/cnd/Lunch/

STAR: Standardized Testing and Reporting—STAR refers to California standardized tests, which include the current CST and previous tests such as the CAT/6. http://star.cde.ca.gov/

Technical Appendix Endnotes

A1. Yuan, Y. (2000). Multiple imputation for missing data: Concepts and new development. *In Proceedings of the Twenty-Fifth Annual SAS Users Group International Conference (Paper No. 267).* Cary, NC: SAS Institute.

A2. Marchenko, Y. (2009). *Multiple-imputation analysis using Stata's mi command*. STATA.

A3. Hosmer, D., & Lemeshow, S. (2000). *Applied Logistic Regression* (2nd ed.). New York: NY: John Wiley and Sons, Inc.

A4. Rabe-Hesketh, S., Skrondal, A. and Pickles, A. (2005). Maximum likelihood estimation of limited and discrete dependent variable models with nested random effects. *Journal of Econometrics* 128: 301–323.

Tables Appendix

		English				Math			
		Foster Youth		Comparison		Foster Youth		Comparison	
	Sample Size	4,005		4,005		3,936		3,936	
		n	%	n	%	n	%	n	%
Grade	2	627	16	627	16	627	16	627	16
	3	696	17	696	17	683	17	683	17
	4	665	17	665	17	650	17	650	17
	5	696	17	696	17	681	17	681	17
	6	733	18	733	18	721	18	721	18
	7	588	15	588	15	574	15	574	15
Academic year	2002–03	40	1	40	1	47	1	47	1
	2003–04	919	23	919	23	908	23	908	23
	2004–05	1204	30	1204	30	1166	30	1166	30
	2005–06	1317	33	1317	33	1301	33	1301	33
	2006–07	525	13	525	13	514	13	514	13
Gender	Female	2112	53	2112	53	2056	52	2056	52
Ethnicity	White/Asian	871	22	871	22	843	21	843	21
	Black	1003	25	1003	25	998	25	998	25
	Hispanic	2098	52	2098	52	2061	52	2061	52
	Other	33	1	33	1	34	1	34	1
NSLP	Yes	3352	84	3352	84	3299	84	3299	84
ELL	Yes	1043	26	1043	26	1040	26	1040	26
Disability	Yes	361	9	361	9	351	9	351	9
School quality	Poor	2097	52	2097	52	2057	52	2057	52
	Average	858	21	858	21	830	21	830	21
	Good	832	21	832	21	841	21	841	21
	Excellent	218	5	218	5	208	5	208	5
Time Variant									
School transfer	Year 1	3005	75*	859	21*	2941	75*	862	22
	Year 2	1980	49*	842	21*	1943	49*	849	22
School transition	Year 1	785	20	661	17	774	20*	605	15
	Year 2	936	23	1060	26	909	23*	1069	27
CST level at baseline	Far below basic	783	20	783	20	562	14	562	14
	Below basic	1079	27	1079	27	1345	34	1345	34
	Basic	1312	33	1312	33	1045	27	1045	27
	Proficient/Advanced	831	21	831	21	984	25	984	25

Table A4 Continued: Foster Youth and Comparison Student Demographic, Child Welfare, and Academic Variables by Number, Percent, and Significant Difference										
English										
CST Baseline Level	Year 3 Level								
	Same Level (Change in Year 1 or 2)+		Far Below Basic		Below Basic		Basic		Proficient/ Advanced	
Foster Youth	n	%	n	%	n	%	n	%	n	%
Far below basic	138	18	244	31*	270	34	103	13	28	4
Below basic	317	29	266	25	167	15	280	26*	49	5
Basic	390	30	89	7	346	26*	254	19	233	18*
Proficient/Advanced	150	18	10	1	53	6	268	32*	350	42*
Comparison	n	%	n	%	n	%	n	%	n	%
Far below basic	166	21	175	22*	284	36	120	15	38	5
Below basic	296	27	189	18	126	12	378	35*	90	8
Basic	380	29	55	4	240	18*	290	22	347	26*
Proficient/Advanced	129	16	7	1	25	3	191	23*	479	58*
Math										
CST Baseline Level	Year 3 Level								
	Same Level (Change in Year 1 or 2)+		Far Below Basic		Below Basic		Basic		Proficient/ Advanced	
Foster Youth	n	%	n	%	n	%	n	%	n	%
Far below basic	146	26	148	26	213	38	39	07	16	3
Below basic	416	31	463	34*	232	17	187	14*	46	3
Basic	256	24	137	13	439	42	93	9	120	11*
Proficient/Advanced	124	13	45	5	190	19	380	39*	245	24*
Comparison	n	%	n	%	n	%	n	%	n	%
Far below basic	145	26	103	18	220	39	61	11	33	6
Below basic	384	29	320	24*	218	16	295	22*	128	10
Basic	272	26	96	9	383	37	91	9	203	19*
Proficient/Advanced	100	10	27	3	144	15	301	31*	412	42*

+Students who changed levels in Years 1 or 2 but were at the same level in Year 3 are represented in this column. If there were no changes in level between baseline and Year 3, students were recorded in the appropriate column. For example, if students were at the basic level at baseline and in Years 1–3, they are represented in the basic column.

*Significant difference between foster youth and comparison group.

Note: Percentages may not total 100% due to rounding.

Table A5: Foster Youth Demographic, Child Welfare, and Academic Variables by Number and Percent					
		English		Math	
	Sample Size	8,523		8,418	
		n	%	n	%
Grade	2	1432	17	1427	17
	3	1424	17	1410	17
	4	1325	16	1316	16
	5	1367	16	1358	16
	6	1439	17	1422	17
	7	1536	18	1485	18
Academic year	2002–03	476	6	474	6
	2003–04	1862	22	1823	22
	2004–05	2164	25	2137	25
	2005–06	2446	29	2422	29
	2006–07	1575	18	1562	19
Gender	Female	4506	53	4460	53
Ethnicity	White/Asian	2053	24	2031	24
	Black	2135	25	2101	25
	Hispanic	4235	50	4186	50
	Other	101	1	100	1
NSLP	Yes	6381	75	6313	75
ELL	Yes	2223	26	2207	26
Disability	Yes	1314	15	1294	15
School quality	Poor	4525	53	4470	53
	Average	1750	21	1717	20
	Good	1722	20	1707	20
	Excellent	526	6	524	6
Child Welfare					
Removal reason	Neglect	6109	72	6027	72
	Physical abuse	1245	15	1238	15
	Sexual abuse	580	7	573	7
	Other	589	7	580	7
Spells	One	5931	77	5859	70
	Two or more	2592	23	2559	30
Major placement type	Kin	3014	35	2979	35
	FFA	2845	33	2823	34
	Foster family home	1419	17	1386	16
	Group	882	10	864	10
	Other	363	4	366	4
Exit type	Reunified	3208	38	3174	38
	No exit	4491	53	4438	53
	Other	824	10	806	10

Table A5: Foster Youth Demographic, Child Welfare, and Academic Variables by Number and Percent						
		English			Math	
	Sample Size	8,523			8,418	
Time Variant						
		n	%		n	%
School transfer	Year 1	6544	77		6456	77
	Year 2	4134	49		4088	49
School transition	Year 1	1541	18		1530	18
	Year 2	2010	24		1973	23
Placement change	Year 1 None	4825	57		4761	57
	One or more	3698	43		3657	43
	Year 2 None	7516	88		7419	88
	One or more	1007	12		999	12
Exit	Year 1	1511	17		1491	18
	Year 2	1664	20		1648	20
Reentry	Year 1	234	3		227	3
	Year 2	256	3		251	3
CST level at baseline	Far below basic	1824	21		1329	16
	Below basic	2303	27		2945	35
	Basic	2640	31		2070	25
	Proficient/Advanced	1756	21		2074	25

CST Baseline Level	Year 3 Level									
	Same Level (Change in Year 1 or 2)[+]		Far Below Basic		Below Basic		Basic		Proficient/Advanced	
	n	%	n	%	n	%	n	%	n	%
English										
Far below basic	340	19	568	31	629	34	218	12	69	4
Below basic	686	30	580	25	316	14	608	26	113	5
Basic	774	29	181	7	711	27	501	19	473	18
Proficient/Advanced	302	17	34	2	126	7	562	32	732	42
Math										
Far below basic	362	27	370	28	469	35	83	6	45	3
Below basic	912	31	510	17	1002	34	418	14	103	3
Basic	509	25	261	13	886	43	173	8	241	12
Proficient/Advanced	243	12	101	5	396	19	807	39	527	25

[+]Students who changed levels in Years 1 or 2 but were at the same level in Year 3 are represented in this column. If there were no changes in level between baseline and Year 3, students were recorded in the appropriate column. For example, if students were at the basic level at baseline and in Years 1–3, they are represented in the basic column.

Note: Percentages may not total 100% due to rounding.

Table A6: Demographic, Child Welfare, and Academic Variables by Number, Percent, and Significant Difference Between Foster Youth Samples								
		English				Math			
		Full Sample		Matched		Full Sample		Matched	
	Sample Size	8,523		4,005		8,418		3,936	
		n	%	n	%	n	%	n	%
Grade	2	1432	17	627	16	1427	17	627	16
	3	1424	17	696	17	1410	17	683	17
	4	1325	16	665	17	1316	16	650	17
	5	1367	16	696	17	1358	16	681	17
	6	1439	17	733	18	1422	17	721	18
	7	1536	18	588	15	1485	18	574	15
Academic year	2002–03	476	6	40	1*	474	6	47	1*
	2003–04	862	22	1919	23	1823	22	908	23
	2004–05	2164	25	1204	30*	2137	25	1166	30*
	2005–06	2446	29	1317	33*	2422	29	1301	33*
	2006–07	1575	18	525	3*	1562	19	514	13*
Gender	Female	4506	53	2112	53	4460	53	2056	52
Ethnicity	White/Asian	2053	24	871	22	2031	24	843	21
	Black	2135	25	1003	25	2101	25	998	25
	Hispanic	4235	50	2098	52	4186	50	2061	52
	Other	101	1	33	1	100	1	34	1
NSLP	Yes	6381	75	3352	84*	6313	75	3299	84*
ELL	Yes	2223	26	1043	26	2207	26	1040	26
Disability	Yes	1314	15	361	9*	1294	15	351	9*
School quality	Poor	4525	53	2097	52	4470	53	2057	52
	Average	1750	21	858	21	1717	20	830	21
	Good	1722	20	832	21	1707	20	841	21
	Excellent	526	6	218	5	524	6	208	5
Removal reason	Neglect	6109	72	2959	74	6027	72	2903	74
	Physical abuse	1245	15	568	14	1238	15	576	15
	Sexual abuse	580	7	232	6	573	7	218	6
	Other	589	7	246	6	580	7	239	6
Spells	One	5931	77	2781	69*	5859	70	2720	69
	Two or more	2592	23	1224	31*	2559	30	1216	31

Table A6 Continued: Demographic, Child Welfare, and Academic Variables by Number, Percent, and Significant Difference Between Foster Youth Samples			English				Math			
			Full Sample		Matched		Full Sample		Matched		
		Sample Size	8,523		4,005		8,418		3,936		
			n	%	n	%	n	%	n	%
Major placement type	Kin		3014	35	1409	35	2979	35	1370	35
	FFA		2845	33	1396	35	2823	34	1379	35
	Foster family home		1419	17	659	17	1386	16	646	16
	Group		882	10	362	9	864	10	365	9
	Other		363	4	179	5	366	4	176	5
Exit type	No exit		3208	38	1931	48*	3174	38	1891	48*
	Reunified		4491	53	1666	42*	4438	53	1650	42*
	Other		824	10	408	10	806	10	395	10
Time Variant										
School transfer	Year 1		6544	77	3005	75	6456	77	2941	75
	Year 2		4134	49	1980	49	4088	49	1943	49
School transition	Year 1		1541	18	785	20	1530	18	774	20
	Year 2		2010	24	936	23	1973	23	909	23
Placement change	Year 1	None	4825	57	2327	57	4761	57	2270	58
		One or more	3698	43	1678	41	3657	43	1666	42
	Year 2	None	7516	88	3524	87	7419	88	3456	88
		One or more	1007	12	481	13	999	12	480	12
Exit	Year 1		1511	17	794	20	1491	18	793	20
	Year 2		1664	20	864	22	1648	20	840	21
Reentry	Year 1		234	3	113	3	227	3	106	3
	Year 2		256	3	109	3	251	3	105	3
CST level at baseline	Far below basic		1824	21	783	20	1329	16	562	14
	Below basic		2303	27	1079	27	2945	35	1345	34
	Basic		2640	31	1312	33	2070	25	1045	27
	Proficient/Advanced		1756	21	831	21	2074	25	984	25

*Significant difference between foster youth samples.
Note: Percentages may not total 100% due to rounding.

CST Baseline Level		Far Below Basic		Below Basic		Basic		Proficient		
Table A7: Multivariate Analysis of Variance (MANOVA), English Foster Youth/Comparison Sample—Difference in Independent Variable Proportions among CST Levels at Baseline										
N		1,566		2,158		2,624		1,662		
		n	%	n	%	n	%	n	%	F-stat
Foster youth	Yes	783	50	1079	50	1312	50	831	50	.00
Grade	2–3	584	37	742	29	796	30	524	32	8.34*
	4–5	472	30	690	27	918	35	642	39	10.48*
	6–7	510	33	726	29	910	35	496	30	3.80*
Gender	Female	650	42	1108	44	1480	56	986	59	41.97*
Ethnicity	White/Asian	150	10	344	14	604	23	644	39	164.01*
	Black	490	31	586	23	638	24	292	18	29.60*
	Hispanic	922	59	1204	48	1358	52	712	43	32.93*
NSLP	Yes	1430	91	1868	74	2152	82	1254	75	57.12*
ELL	Yes	558	36	612	24	650	25	266	16	57.84*
Disability	Yes	426	27	194	8	78	3	24	1	322.93*
School quality	Poor	874	56	1145	53	1317	50	851	51	4.58*
	Average	320	20	449	21	573	22	381	23	1.28
	Good	288	18	436	20	598	23	342	21	4.12*
	Excellent	84	5	128	6	136	5	88	5	.48
Spells	More than one	526	34	704	28	768	29	450	27	7.57*
Transfer	Year 1	796	51	1078	43	1227	47	763	46	4.23*
	Year 2	631	40	772	31	892	34	527	32	9.58*
Transition	Year 1	286	18	358	14	505	19	297	18	1.91
	Year 2	363	23	572	23	742	28	486	29	6.10*

*Significant difference at .05 or below.

CST Baseline Level		Far Below Basic		Below Basic		Basic		Proficient		
N		1,124		2,690		2,090		1,968		
		n	%	n	%	n	%	n	%	F-stat
Foster youth	Yes	562	50	1345	50	1045	50	984	50	.00
Grade	2–3	260	23	852	32	654	31	857	44	51.74*
	4–5	410	36	840	31	732	35	677	34	4.43*
	6–7	454	40	988	37	704	34	434	22	52.87*
Gender	Female	540	48	1401	52	1132	54	1039	53	3.77*
Ethnicity	White/Asian	100	9	378	14	516	25	692	35	149.90*
	Black	406	36	804	30	460	22	326	17	65.13*
	Hispanic	614	55	1476	55	1094	52	938	48	8.86*
NSLP	Yes	1006	90	2336	87	1714	82	1542	78	31.44*
ELL	Yes	382	34	742	28	542	26	414	21	21.69*
Disability	Yes	304	27	277	10	78	4	43	2	232.14*
School quality	Poor	612	54	1409	52	1088	52	999	51	1.32
	Average	258	23	563	21	418	20	422	21	2.46
	Good	198	18	551	20	488	23	444	23	1.34
	Excellent	54	5	166	6	94	4	102	5	5.75*
Spells	More than one	406	36	866	32	652	31	508	26	13.53*
Transfer	Year 1	546	49	1306	49	1010	48	941	48	.10
	Year 2	396	35	967	36	715	34	714	36	.77
Transition	Year 1	252	22	462	17	356	17	309	16	7.94*
	Year 2	362	32	758	28	583	28	460	23	10.06*

Table A8: Multivariate Analysis of Variance (MANOVA), Math Foster Youth/Comparison Sample—Difference in Independent Variable Proportions among CST Levels at Baseline

*Significant difference at .05 or below.

Table A9: Multivariate Analysis of Variance (MANOVA), English Sample—Difference in Independent Variable Proportions among CST Levels at Baseline

CST Baseline Level		Far Below Basic		Below Basic		Basic		Proficient		
N		1,824		2,303		2,640		1,756		
		n	%	n	%	n	%	n	%	F-stat
Grade	2–3	663	36	794	34	827	31	572	33	4.64*
	4–5	517	28	695	30	878	33	602	34	6.78*
	6–7	644	35	814	35	935	35	582	33	1.01
Gender	Female	794	44	1182	51	1505	57	1025	58	35.6*
Ethnicity	White/Asian	296	16	439	19	651	25	667	38	96.23*
	Black	545	30	614	27	629	24	347	20	18.14*
	Hispanic	972	53	1221	53	1325	50	716	41	25.47*
NSLP	Yes	1445	79	1788	78	1949	74	1199	68	23.44*
ELL	Yes	586	32	684	30	671	25	282	16	48.22*
Disability	Yes	593	33	376	16	209	8	136	8	216.33*
School quality	Poor	1009	55	1236	54	1381	52	899	51	2.37
	Average	357	20	466	20	540	20	387	22	1.20
	Good	336	18	444	19	566	21	376	21	2.97
	Excellent	122	7	157	7	153	6	94	5	1.73
Spells	More than one	1217	67	1575	68	1873	71	1266	72	5.4*
Removal reason	Neglect	1310	72	1650	72	1892	72	1257	72	0.01
	PA	255	14	356	15	371	14	263	15	0.92
	SA	118	6	147	6	206	8	109	6	2.04
Major placement type	Kin	580	32	783	34	948	36	703	40	9.74*
	FFA	645	35	793	34	875	33	532	30	3.99*
	Foster family	343	19	395	17	412	16	269	15	3.61*
	Group	181	10	235	10	279	11	187	11	0.24
Exit type	No exit	984	54	1209	52	1397	53	901	51	0.86
	Reunified	646	35	862	37	998	38	702	40	2.67*
Transfer	Year 1	1381	76	1790	78	2022	77	1351	77	0.80
	Year 2	916	50	1120	49	1244	47	854	49	1.40
Transition	Year 1	343	19	407	18	484	18	307	17	0.48
	Year 2	421	23	525	23	650	25	414	24	0.87
Placement change (any)	Year 1	824	45	1034	45	1095	41	745	42	3.03*
	Year 2	214	12	253	11	326	12	214	12	0.83
Exit	Year 1	337	18	406	18	461	17	307	17	0.30
	Year 2	350	19	444	19	524	20	346	20	0.14
Reentry	Year 1	45	2	63	3	80	.3	46	3	0.48
	Year 2	69	4	71	3	70	3	46	3	1.96

*Significant difference at .05 or below.

Table A10: Multivariate Analysis of Variance (MANOVA), Math Sample—Difference in Independent Variable Proportions among CST Levels at Baseline									
CST Baseline Level		Far Below Basic		Below Basic		Basic		Proficient	
N		1,329		2,945		2,070		2,074	
		n	%	n	%	n	%	n	%	F-stat
Grade	2–3	309	23	883	30	703	34	942	45	72.01*
	4–5	450	34	924	31	656	32	644	31	1.13
	6–7	570	43	1138	39	711	34	488	24	59.25*
Gender	Female	642	48	1609	55	1142	55	1067	51	6.96*
Ethnicity	White/Asian	206	16	547	19	562	27	716	35	81.04*
	Black	463	35	842	29	437	21	359	17	58.21*
	Hispanic	649	49	1522	52	1041	50	974	47	3.84*
NSLP	Yes	1028	77	2301	78	1507	73	1477	71	13.56*
ELL	Yes	387	29	833	28	536	26	451	22	11.32*
Disability	Yes	474	36	477	16	173	8	170	8	208.56*
School quality	Poor	700	53	1605	54	1090	53	1075	52	1.3
	Average	292	22	595	20	403	19	427	21	1.08
	Good	239	18	546	19	462	22	460	22	6.61*
	Excellent	98	7	199	7	115	6	112	5	2.82*
Spells	More than one	460	35	950	32	617	30	532	26	12.85*
Removal reason	Neglect	960	72	2090	71	1488	72	1489	72	0.32
	PA	186	14	443	15	307	15	302	15	0.29
	SA	84	6	200	7	151	7	138	7	0.45
Major placement type	Kin	390	29	1028	35	714	34	847	41	16.49*
	FFA	461	35	1041	35	675	33	646	31	3.75*
	Foster family	285	21	490	17	331	16	280	14	12.59*
	Group	144	11	277	9	234	11	209	10	1.78
Exit type	No exit	715	54	1558	53	1082	52	1083	52	0.35
	Reunified	469	35	1080	37	797	39	828	40	3.18*
Transfer	Year 1	937	71	2244	76	1630	79	1645	79	13.97*
	Year 2	598	45	1364	46	1018	49	1108	53	10.92*
Transition	Year 1	321	24	557	19	342	17	310	15	17.22*
	Year 2	381	29	728	25	468	23	396	19	15.26*
Placement change (any)	Year 1	600	45	1308	44	885	43	864	42	1.93
	Year 2	145	11	358	12	236	11	260	13	0.91
Exit	Year 1	238	18	535	18	350	17	368	18	0.46
	Year 2	259	19	575	20	415	20	399	19	0.15
Reentry	Year 1	37	3	90	3	59	3	41	2	1.92
	Year 2	52	4	99	3	55	3	45	2	3.65*

*Significant difference at .05 or below.

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Table A11: Foster Youth/Comparison English and Math Sample, Multinomial Multivariate Random Intercept/Coefficient, CST

			English			Math		
Below Basic Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Foster youth	No	Yes	-.04	.10		-.23	.09	.01
Grade	2–3	4–5	.00	.10		-.50	.09	.00
		6–7	.03	.07		-.61	.06	.00
Gender	Male	Female	.65	.08	.00	.29	.07	.00
Ethnicity	White/Asian	Black	-1.14	.12	.00	-1.06	.11	.00
		Hispanic	-.15	.09		.06	.08	
		Other	.72	.48		.50	.38	
NSLP	No	Yes	-.54	.12	.00	-.33	.07	.00
ELL	No	Yes	-.48	.10	.00	-.40	.09	.00
Disability	No	Yes	-2.27	.12	.00	-1.65	.10	.00
School quality	Poor	Average	.15	.09		.00	.08	
		Good	.23	.10	.02	.20	.08	.02
		Excellent	-.15	.12		.16	.15	
Spells	One	Two or more	-.10	.08		-.17	.07	.02
School transfer	Yr. 1	No	Yes	.14	.05	.01	-.08	.05	
	Yr. 2	No	Yes	-.07	.09		-.27	.08	.00
School transition	Yr. 1	No	Yes	.11	.05		-.14	.05	.00
	Yr. 2	No	Yes	-.07	.10		-.31	.09	.00
Foster youth transfer	Yr. 1	No	Yes	.08	.10		-.11	.08	
	Yr. 2	No	Yes	.09	.09		-.19	.08	
Intercept			2.51	.20	.00	2.90	.17	.00
Basic Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Foster youth	No	Yes	-.23	.10	.03	-.37	.09	.00
Grade	2–3	4–5	.02	.11		-.59	.10	.00
		6–7	-.09	.08		-.99	.07	.00
Gender	Male	Female	.85	.08	.00	.28	.07	.00
Ethnicity	White/Asian	Black	-1.64	.13	.00	-1.80	.11	.00
		Hispanic	-.17	.09		.04	.08	
		Other	.61	.48		.36	.38	
NSLP	No	Yes	-.74	.12	.00	-.51	.09	.00
ELL	No	Yes	-.65	.10	.00	-.52	.09	.00
Disability	No	Yes	-3.29	.13	.00	-2.58	.11	.00
School quality	Poor	Average	.20	.10		-.01	.08	
		Good	.30	.10	.00	.30	.08	.00
		Excellent	-.30	.17		.06	.15	

Table A11 Continued: Foster Youth/Comparison English and Math Sample, Multinomial Multivariate Random Intercept/Coefficient, CST								
Basic Compared to Far Below Basic								
Variable		Reference		Coef.	SE	P-value	Coef.	SE	P-value
Spells		One	Two or more	-.20	.09	.02	-.21	.07	.01
School transfer	Yr. 1	No	Yes	.21	.05	.03	.03	.04	
	Yr. 2	No	Yes	-20	.10	-.30	-.30	.08	.00
School transition	Yr. 1	No	Yes	.22	.05	-.11	-.11	.05	.03
	Yr. 2	No	Yes	-.13	.11	-.45	-.45	.09	.00
Foster youth transfer	Yr. 1	No	Yes	-.20	.09	-.23	-.23	.10	.02
	Yr. 2	No	Yes	.12	.09	.16	.16	.09	
Intercept				2.13	.17	.00	2.91	.17	.00
Proficient/Advanced Compared to Far Below Basic								
Variable		Reference		Coef.	SE	P-value	Coef.	SE	P-value
Foster youth		No	Yes	-.41	.10	.00	-.67	.09	.00
Grade		2–3	4–5	.04	.12		-1.04	.10	.00
			6–7	-.18	.09	.04	-1.66	.07	.00
Gender		Male	Female	1.03	.09	.00	.20	.07	.00
Ethnicity		White/Asian	Black	-2.38	.13	.00	-2.44	.11	.00
			Hispanic	-.28	.10	.00	-.03	.08	
			Other	.59	.54		.24	.39	
NSLP		No	Yes	-1.01	.12	.00	-.83	.10	.00
ELL		No	Yes	-1.01	.11	.00	-.63	.09	.00
Disability		No	Yes	-3.69	.14	.00	-2.83	.12	.00
School quality		Poor	Average	.21	.11	.04	.03	.08	
			Good	.24	.10	.02	.24	.09	.01
			Excellent	-.25	.17		.14	.15	
Spells		One	Two or more	-.36	.10	.00	-.38	.07	.00
School transfer	Yr. 1	No	Yes	.39	.05	.07	.07	.05	
	Yr. 2	No	Yes	-.20	.09	-.42	-.42	.09	.00
School transition	Yr. 1	No	Yes	.29	.05	-.01	-.01	.05	
	Yr. 2	No	Yes	-.15	.10	-.56	-.56	.09	.00
Foster youth transfer	Yr. 1	No	Yes	-.25	.06	-.23	-.23	.10	.01
	Yr. 2	No	Yes	.18	.09	.18	.18	.09	
Intercept				2.73	.20	.00	3.17	.17	.00
Log likelihood					-38087.68			-38441.84	
Level 1 (student years)					32040			7863	
Level 2 (students)					8010			31461	
Variance level 2 (SE)					5.69 (.35)			3.33 (.22)	
Covariance (level 2, 1)					.28 (.23)			.34 (.16)	
Correlation (level 2, 1)					.99			.50	
Variance level 2 (SE) covariate foster youth status					.01 (.02)			.14 (.14)	

Table A12: Foster Youth English Sample, Multinomial Multivariate Random Intercept, CST

Below Basic Compared to Far Below Basic

Variable	Reference			Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3		4–5	-.20	.09		-.19	.08	
			6–7	.12	.06		.11	.09	
Gender	Male		Female	.52	.07	.00	.54	.08	.00
Ethnicity	White/Asian		Black	-1.09	.11	.00	-.99	.11	.00
			Hispanic	-.20	.08	.02	-.16	.08	
			Other	.27	.32		.15	.35	
NSLP	No		Yes	-.30	.09	.00	-.30	.09	.00
ELL	No		Yes	-.47	.09	.00	-.47	.09	.00
Disability	No		Yes	-1.98	.10	.00	-2.02	.10	.00
School quality	Poor		Average	.18	.09	.05	.18	.10	
			Good	.03	.09		.05	.10	
			Excellent	-.19	.14		-.19	.06	
Spells	One		Two or more	-.09	.08		-.12	.08	
Removal reason	Neglect		Physical abuse	.15	.10		.14	.11	
			Sexual abuse	.03	.17		.00	.16	
			Other	-.16	.14		-.16	.16	
Major placement type	Kin		FFA	-.26	.09	.00	-.26	.09	.01
			Foster family home	-.28	.10	.00	-.29	.10	.01
			Group	.28	.12	.02	.30	.13	.02
			Other	.62	.23	.01	.61	.24	.01
Exit type	No exit		Reunified	.27	.11	.05	.22	.04	.00
			Other	-.12	.06		-.12	.06	.04
School transfer	Yr. 1	No	Yes	.12	.12				
	Yr. 2	No	Yes	-.11	.08				
School transition	Yr. 1	No	Yes	.11	.17				
	Yr. 2	No	Yes	-.14	.10				
Placement change	Yr. 1	None	One or more	-.11	.08				
	Yr. 2	None	One or more	-.06	.10				
Foster care exit	Yr. 1	No	Yes	-.19	.11				
	Yr. 2	No	Yes	-.10	.11				
Reentry		No	Yes	-.21	.12	.03			
Change	Yr. 1						-.11	.05	.02
	Yr. 2						-.15	.02	.00
Intercept				2.15	.24	.00	2.28	.18	.00

Table A12 Continued: Foster Youth English Sample, Multinomial Multivariate Random Intercept, CST								
Basic Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-.10	.06		-.08	.09	
		6–7	-.17	.07	.01	-.17	.08	.04
Gender	Male	Female	.70	.08	.00	.71	.08	.00
Ethnicity	White/ Asian	Black	-1.55	.12	.00	-1.44	.11	.00
		Hispanic	-.21	.09	.03	-.16	.09	
		Other	.06	.40		.07	.35	
NSLP	No	Yes	-.46	.10	.00	-.48	.09	.00
ELL	No	Yes	-.70	.11	.00	-.71	.10	.00
Disability	No	Yes	-2.73	.11	.00	-2.77	.10	.00
School quality	Poor	Average	.18	.11		.19	.10	
		Good	.05	.11		.02	.10	
		Excellent	-.27	.17		-.29	.16	
Spells	One	Two or more	-.17	.09	.04	-.18	.08	.04
Removal reason	Neglect	Physical abuse	.16	.12		.19	.11	
		Sexual abuse	.02	.17		.03	.16	
		Other	-.21	.16		-.21	.16	
Major placement type	Kin	FFA	-.34	.10	.00	-.33	.09	.00
		Foster family home	-.37	.11	.00	-.41	.10	.00
		Group	.34	.14	.02	.38	.13	.00
		Other	.70	.25	.01	.17	.24	.00
Exit type	No exit	Reunified	.28	.10	.00	.24	.04	.02
		Other	-.22	.10	.03	-.21	.08	.00
School transfer	Yr. 1	No	Yes	.05	.18				
	Yr. 2	No	Yes	-.11	.10				
School transition	Yr. 1	No	Yes	-.07	.20				
	Yr. 2	No	Yes	-.17	.12				
Placement change	Yr. 1	None	One or more	-.22	.03	.02			
	Yr. 2	None	One or more	.10	.05				
Foster care exit	Yr. 1	No	Yes	-.18	.14				
	Yr. 2	No	Yes	.00	.13				
Reentry		No	Yes	-.29	.14	.02			
Change	Yr. 1						-.15	.05	.00
	Yr. 2						-.11	.04	.03
Intercept			2.48	.28	.00	2.65	.18	.00

Table A12 Continued: Foster Youth English Sample, Multinomial Multivariate Random Intercept, CST								
Proficient/Advanced Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-.10	.06		-.09	.05	
		6–7	-.21	.10	.03	-.18	.07	.04
Gender	Male	Female	.80	.09	.00	.84	.08	.00
Ethnicity	White/ Asian	Black	-2.14	.13	.00	-2.02	.12	.00
		Hispanic	-.40	.10	.00	-.36	.09	.00
		Other	.25	.42		.20	.35	
NSLP	No	Yes	-.65	.10	.00	-.65	.09	.00
ELL	No	Yes	-1.07	.11	.00	-1.08	.10	.00
Disability	No	Yes	-2.81	.13	.00	-2.78	.11	.00
School quality	Poor	Average	.20	.12		.22	.10	.03
		Good	.12	.12		.11	.10	
		Excellent	-.32	.18		-.36	.16	.02
Spells	One	Two or more	-.32	.10	.00	-.31	.09	.00
Removal reason	Neglect	Physical abuse	.08	.13		.09	.11	
		Sexual abuse	-.06	.19		-.03	.16	
		Other	-.11	.18		-.13	.16	
Major placement type	Kin	FFA	-.46	.11	.00	-.45	.10	.00
		Foster family home	-.51	.12	.00	-.48	.11	.00
		Group	.49	.15	.00	.46	.13	.00
		Other	.48	.28		.53	.25	.03
Exit type	No exit	Reunified	.44	.10	.00	.35	.08	.00
		Other	-.35	.14	.00	-.32	.06	.00
School transfer	Yr. 1	No	Yes	.10	.12			
	Yr. 2	No	Yes	-.01	.19			
School transition	Yr. 1	No	Yes	.11	.19			
	Yr. 2	No	Yes	-.15	.13			
Placement change	Yr. 1	None	One or more	-.20	.10	.05		
	Yr. 2	None	One or more	.08	.18			
Foster care exit	Yr. 1	No	Yes	-.20	.15			
	Yr. 2	No	Yes	-.07	.14			
Reentry		No	Yes	-.29	.15	.01		
Change	Yr. 1					-.13	.05	.01
	Yr. 2					-.10	.03	
Intercept			2.04	.30	.00	2.27	.18	.00
Log likelihood			-41734.83			-41861.20		
Level 1 (student years)			34092			34092		
Level 2 (students)			8523			8523		
Variance level 2 (SE)			6.04 (.22)			6.21 (.24)		

Table A13: Foster Youth Math Sample, Multinomial Multivariate Random Intercept, CST								
Below Basic Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-.38	.08	.00	-.36	.08	.00
		6–7	-.33	.06	.00	-.32	.06	.00
Gender	Male	Female	.23	.06	.00	.22	.06	.00
Ethnicity	White/Asian	Black	-.99	.09	.00	-.98	.09	.00
		Hispanic	.08	.06		.08	.06	
		Other	2.10	.91	.02	2.05	.90	.02
NSLP	No	Yes	-.24	.07	.00	-.24	.07	.00
ELL	No	Yes	-.31	.07	.00	-.31	.07	.00
Disability	No	Yes	-1.56	.07	.00	-1.56	.07	.00
School quality	Poor	Average	-.15	.07	.03	-.16	.08	.03
		Good	.10	.05	.04	.10	.05	.05
		Excellent	-.08	.06		-.08	.06	
Spells	One	Two or more	-.03	.07		.03	.07	
Removal reason	Neglect	Physical abuse	.08	.08		.09	.08	
		Sexual abuse	.04	.11		.04	.11	
		Other	-.19	.12		-.19	.12	
Major placement type	Kin	FFA	-.21	.07	.01	-.22	.07	.01
		Foster family home	-.28	.08	.00	-.28	.08	.00
		Group	.25	.10	.02	.25	.10	.02
		Other	.36	.20		.36	.20	
Exit type	No exit	Reunified	.15	.08	.02	.16	.08	.02
		Other	-.10	.06		-.10	.06	
School transfer	Yr. 1	No	Yes	.17	.13				
	Yr. 2	No	Yes	-.05	.07				
School transition	Yr. 1	No	Yes	.24	.16				
	Yr. 2	No	Yes	-.17	.09				
Placement change	Yr. 1	None	One or more	-.12	.07				
	Yr. 2	None	One or more	.10	.12				
Foster care exit	Yr. 1	No	Yes	-.03	.09				
	Yr. 2	No	Yes	-.16	.10				
Reentry		No	Yes	-.11	.08				
Change	Yr. 1						-.04	.02	
	Yr. 2						-.10	.02	.03
Intercept			2.40	.26	.00	2.45	.20	.00

Table A13 Continued: Foster Youth Math Sample, Multinomial Multivariate Random Intercept, CST								
Basic Compared to Far Below Basic								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-.53	.08	.00	-.54	.08	.00
		6–7	-.57	.06	.00	-.57	.06	.00
Gender	Male	Female	.21	.07	.00	.22	.07	.00
Ethnicity	White/ Asian	Black	-1.61	.10	.00	-1.59	.10	.00
		Hispanic	.09	.08		.09	.08	
		Other	2.27	.78	.00	2.27	.78	.00
NSLP	No	Yes	-.40	.08	.00	-.40	.08	.00
ELL	No	Yes	-.48	.09	.00	-.48	.09	.00
Disability	No	Yes	-2.22	.10	.00	-2.21	.10	.00
School quality	Poor	Average	-.15	.05	.04	-.15	.05	.04
		Good	.22	.06	.00	.22	.06	.00
		Excellent	-.19	.08	.02	-.19	.08	.02
Spells	One	Two or more	-.06	.08		-.06	.08	
Removal reason	Neglect	Physical abuse	.08	.10		.09	.10	
		Sexual abuse	.10	.11		.10	.11	
		Other	-.34	.12	.02	-.34	.12	.02
Major placement type	Kin	FFA	-.33	.08	.00	-.33	.08	.00
		Foster family home	-.40	.09	.00	-.40	.09	.00
		Group	.43	.12	.00	.41	.12	.00
		Other	.40	.22		.40	.22	
Exit type	No exit	Reunified	-.20	.08	.01	-.22	.08	.01
		Other	-.10	.04		-.10	.04	
School transfer	Yr. 1	No	Yes	.29	.16			
	Yr. 2	No	Yes	.00	.08			
School transition	Yr. 1	No	Yes	.33	.18			
	Yr. 2	No	Yes	-.15	.11			
Placement change	Yr. 1	None	One or more	-.22	.08	.01		
	Yr. 2	None	One or more	.14	.10			
Foster care exit	Yr. 1	No	Yes	-.15	.21			
	Yr. 2	No	Yes	-.13	.11			
Reentry	No	Yes	-.33	.13	.03			
Change	Yr. 1						-.15	.05	.00
	Yr. 2						-.06	.02	
Intercept			2.13	.27	.00	2.23	.15	.00

Table A13 Continued: Foster Youth Math Sample, Multinomial Multivariate Random Intercept, CST									
Proficient/Advanced Compared to Far Below Basic									
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-1.22	.07	.00	-1.20	.07	.00
		6–7	-.84	.06	.00	-.84	.06	.00
Gender	Male	Female	.10	.08		.11	.08	
Ethnicity	White/Asian	Black	-2.10	.11	.00	-2.10	.11	.00
		Hispanic	.11	.39		.11	.39	
		Other	2.05	.92	.00	2.05	.92	.00
NSLP	No	Yes	-.56	.09	.00	-.52	.09	.00
ELL	No	Yes	-.60	.10	.00	-.60	.10	.00
Disability	No	Yes	-2.19	.11	.00	-2.19	.11	.00
School quality	Poor	Average	-.05	.04		-.05	.04	
		Good	.17	.06	.03	.17	.06	.03
		Excellent	-.22	.07	.00	-.22	.07	.00
Spells	One	Two or more	-.22	.09	.01	-.20	.09	.01
Removal reason	Neglect	Physical abuse	.10	.11		.10	.11	
		Sexual abuse	.08	.15		.08	.15	
		Other	-.19	.16		-.19	.16	
Major placement type	Kin	FFA	-.42	.10	.00	-.42	.10	.00
		Foster family home	-.48	.11	.00	-.44	.11	.00
		Group	.38	.13	.00	.38	.13	.00
		Other	.35	.25		.35	.25	
Exit type	No exit	Reunified	-.20	.08	.02			
		Other	-.27	.09	.00			
School transfer	Yr. 1	No	Yes	.09	.10				
	Yr. 2	No	Yes	.01	.10				
School transition	Yr. 1	No	Yes	.29	.15				
	Yr. 2	No	Yes	-.25	.11	.04			
Placement change	Yr. 1	None	One or more	-.24	.09	.01			
	Yr. 2	None	One or more	.18	.11	.05			
Foster care exit	Yr. 1	No	Yes	.04	.13				
	Yr. 2	No	Yes	-.02	.13				
Reentry	No	Yes	-.43	.18	.00			
Change	Yr. 1						-.16	.03	.01
	Yr. 2						-.05	.03	
Intercept			2.32	.32	.00	2.42	.20	.00
Log likelihood			-41289.33			-41312.45		
Level 1 (student years)			33672			33672		
Level 2 (students)			8418			8418		
Variance level 2 (SE)			4.10 (.16)			4.16 (.12)		

Table A14: Foster Youth English and Math, Multinomial Multivariate Random Intercept, School Quality								
			English			Math		
Average Compared to Poor								
Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3	4–5	-.08	.04		-.04	.03	
		6–7	.04	.02		.03	.02	
Gender	Male	Female	.01	.06		.04	.02	
Ethnicity	White/Asian	Black	-.17	.08	.04	-.12	.04	.02
		Hispanic	.03	.06		.04	.02	
		Other	-.04	.08		.04	.03	
NSLP	No	Yes	-.04	.06		-.01	.03	
ELL	No	Yes	.01	.06		-.11	.04	.04
Disability	No	Yes	.04	.08		-.03	.02	
CST level at baseline	Far below basic	Below basic	.22	.08	.00	08	.04	
		Basic	.23	.06	.00	.21	.04	.00
		Proficient	.27	.07	.00	.05	.03	
Spells	One	Two or more	.00	.06		.01	.03	
Removal reason	Neglect	Physical abuse	-.02	.08		-.04	.02	
		Sexual abuse	-.12	.11		-.08	.05	
		Other	.08	.11		.13	.12	
Major placement type	Kin	FFA	-.02	.07		-.06	.05	
		Foster family home	.04	.08		.06	.07	
		Group	.01	.09		-.02	.05	
		Other	.16	.16		.08	.06	
Exit type	No exit	Reunified	.08	.04		-.04	.02	
		Other	-.04	.05		-.08	.05	
School transfer	Yr. 1	No	Yes	.25	.12	.02	.23	.07	.04
School transition	Yr. 1	No	Yes	.12	.14		.12	.07	
Placement change	Yr. 1	None	One or more	.11	.03	.03	.13	.06	.00
Foster care exit	Yr. 1	No	Yes	-.02	.04		.05	.03	
Reentry		No	Yes	-.16	.07		-.11	.06	
Intercept			-1.03	.15	.00	-1.01	.09	.00

Variable	Reference		Coef.	SE	P-value	Coef.	SE	P-value
Good Compared to Poor								
Grade	2–3	4–5	-.04	.04		.04	.02	
		6–7	-.08	.03		-.06	.03	
Gender	Male	Female	.02	.02		.04	.02	
Ethnicity	White/Asian	Black	-.37	.08	.00	-.37	.08	.00
		Hispanic	.04	.04		.01	.03	
		Other	-.38	.26	.03	-.29	.14	
NSLP	No	Yes	-.07	.06		-.06	.04	
ELL	No	Yes	-.08	.07		-.09	.04	
Disability	No	Yes	-.01	.08		-.07	.04	
CST level at baseline	Far below basic	Below basic	.09	.07		.05	.04	
		Basic	.25	.07	.00	.22	.05	.00
		Proficient	.33	.07	.00	.24	.06	.00
Spells	One	Two or more	-.03	.06		-.05	.03	
Removal reason	Neglect	Physical abuse	-.04	.07		-.05	.04	
		Sexual abuse	-.05	.11		-.03	.04	
		Other	-.03	.11		-.06	.05	
Major placement type	Kin	FFA	-.02	.06		-.05	.04	
		Foster family home	.01	.06		.01	.05	
		Group	.08	.09		.09	.08	
		Other	.06	.16		-.07	.06	
Exit type	No exit	Reunified	-.14	.04	.03	-.15	.06	.02
		Other	.04	.05		.04	.05	
School transfer	Yr. 1 No	Yes	.24	.12	.03	.14	.06	
School transition	Yr. 1 No	Yes	.25	.14	.03	.18	.08	
Placement change	Yr. 1 None	One or more	.03	.02		.11	.06	
Foster care exit	Yr. 1 No	Yes	.07	.09		.10	.05	
Reentry	No	Yes	-.05	.06		-.09	.07	
Intercept			-1.13	.18	.00	-1.09	.16	.00

Table A14 Continued: Foster Youth English and Math, Multinomial Multivariate Random Intercept, School Quality

Table A14 Continued: Foster Youth English and Math, Multinomial Multivariate Random Intercept, School Quality								

Excellent Compared to Poor								
Variable	Reference			Coef.	SE	P-value	Coef.	SE	P-value

Variable	Reference			Coef.	SE	P-value	Coef.	SE	P-value
Grade	2–3		4–5	-.10	.07		-.12	.07	
			6–7	-.05	.05		-.06	.05	
Gender	Male		Female	.10	.05		.10	.05	
Ethnicity	White/Asian		Black	-.48	.10	.00	-.45	.07	.00
			Hispanic	-.02	.07		-.04	.05	
			Other	-.46	.35	.01	-.52	.31	
NSLP	No		Yes	-.23	.07	.00	-.24	.05	.00
ELL	No		Yes	-.19	.09	.04	-.17	.06	.04
Disability	No		Yes	-.01	.10		-.11	.05	
CST level at baseline	Far below basic		Below basic	.20	.09	.02	.21	.07	.05
			Basic	.08	.08		.10	.06	
			Proficient	.19	.08	.03	.05	.06	
Spells	One		Two or more	-.08	.07		-.11	.05	
Removal reason	Neglect		Physical abuse	-.01	.10		.04	.06	
			Sexual abuse	-.20	.12		-.23	.10	
			Other	-.04	.12		-.06	.08	
Major placement type	Kin		FFA	.18	.08	.02	.23	.06	.00
			Foster family home	.10	.10		.10	.06	
			Group	.06	.11		.08	.05	
			Other	.01	.20		-.04	.04	
Exit type	No exit		Reunified	-.11	.07		-.11	.07	
			Other	.26	.08	.01	.25	.08	.02
School transfer	Yr. 1	No	Yes	.26	.15	.04	.20	.10	.05
School transition	Yr. 1	No	Yes	.13	.17		.09	.12	
Placement change	Yr. 1	None	One or more	-.10	.03		.04	.03	
Foster care exit	Yr. 1	No	Yes	-.07	.11		-.11	.08	
Reentry		No	Yes	.29	.10	.02	.34	.12	.00
Intercept				-2.32	.23	.00	-2.37	.24	.00
Log likelihood					-36756.24			-35103.45	
Level 1 (student years)					34092			33672	
Level 2 (students)					8523			8418	
Variance level 2 (SE)					3.62 (.11)			3.32 (.11)	