2012-07-09

What Types of After-School Programs Benefit LEP Students?

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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Science

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August 2012

ABSTRACT

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With the increase in federal funding for the 21st Century Community Learning Centers (21st CCLC) after-school program, more intricate evaluations are needed to assess the needs and successes of the programs. And with many programs targeting students of minority and limited-English proficiency (LEP) status, additional analyses should focus on these targeted populations. This study examines a regional 21st CCLC program with math and English standardized test scores (CRT scores) for students prior to participation and after two years of participation. These test scores were used to create a score change variable, which provides a unique approach to assessing after-school programs. Analyses indicate that LEP participants are the furthest behind and have the most to gain by participating in the program. Also, the type of activity participated in matters. Overall, participants benefit from both academic and enrichment activities, but LEP participants benefit most from academic activities and from higher participation. Site coordinators need to be aware of the different types of participants and structure programs accordingly.

Keywords: after-school, 21st CCLC, education, limited English proficiency

ACKNOWLEDGEMENTS

I would like to express my greatest appreciation to Carol Ward. Her patience and encouragement have been the driving force behind my work. I would also like to thank the other members of my committee, Ben Gibbs and Bert Burraston, who have been particularly helpful these past few months. I owe Tim Heaton words of appreciation. His kindness and assistance taught me a lot about the research process (and we had lots of fun in Mexico). I want to thank John Hoffmann for teaching me the world of STATA and Margaret McCabe for always being there to push me. Lastly, I would like to thank my friends, family, and Jordan for being supportive throughout the whole process.

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INTRODUCTION

The recent history of after-school programs shows a dramatic increase in interest and participation in after-school programs among American families and students. The percentage of public schools with after-school programs increased from sixteen percent in 1987 to forty-seven percent in 1999 (DeAngelis and Rossi 1997; Dynarski et al. 2003). In 2009 over a quarter of school-aged children were left unsupervised after school, and forty percent of parents reported that they wanted a quality after-school program for their children and community, with almost fifty percent of Hispanic parents in want of an after-school program (Afterschool Alliance 2009). In 2012 the Afterschool Alliance reported that 8.4 million (fifteen percent) American students, kindergarten to 12th grade, participate in some form of after-school program (Afterschool Alliance 2012). In the most recent report, the federal government appropriated $1.2 billion for the 21st Century Community Learning Centers (21st CCLC) after-school program, serving 1.7 million children and youth (Naftzger and Vinson 2011). The two major goals of the program are to provide a safe environment for students after school and to improve standardized test scores. 21st CCLC programs are the only federally funded after-school programs. This makes the program the target of political debate, and the questions arise, “Is it delivering? And for whom?”

There are numerous evaluations of 21st CCLC after-school programs. These analyses typically review only one year of participation (Kane 2004; Little, Wimer, and Weiss 2007) and have found mixed results that are not usually significant (Granger and Kane 2004; James-Burdumy et al. 2005). Also, these studies rely on limited measures: quasi-experimental research designs, binary outcome variables (e.g. test scores improved or not), and binary explanatory variables (e.g. attended program or not), which limit the research questions and types of statistical analyses (Granger and Kane 2004; Huang et al. 2008; Jenner and Jenner 2007; Little et al. 2007). Furthermore, most of these studies examine the programs at a national or state level, which neglects the many intricacies of the programs. Programs vary by school systems and schools. National, and even state-level, assessments capture the averages of the programs and neglect the multifaceted qualities of the programs.

The purpose of this regional study is to examine a particular school district's 21st CCLC program, which will capture aspects of the program that the national- and state-level evaluations overlook. Individual student-level and school-level data are used to evaluate students with two years of consecutive after-school program attendance to determine if continuous participation over two years leads to better student academic achievement. Academic achievement is based on criterion-referenced test (CRT) scores given at the end of the school year, which is measured as the percentage of correct responses. Students' CRT scores before beginning the after-school program are compared to CRT scores after two years of participation to create the score-change outcome variable. Score change models are not the usual way of assessing after-school programs, but it is valuable in representing how the students were behind before participation in the program. Targeted groups of 21st CCLC programs (minorities and low-income students) are of primary interest in this analysis. Given the unique obstacles these students face, limited English proficiency (LEP) students are the focus of this analysis of program effects on at-risk populations. LEP students are not only disproportionately low-income and minority students, but also have a language barrier to overcome. Therefore, LEP students are some of the most at-risk students in schools today.

This study of an after-school program in an intermountain state provides more detailed view of the experiences of LEP students. This metropolitan area is one of the fastest growing areas in the country. It grew by almost forty percent from 2000 to 2010, which included a seventy-eight percent increase in the Hispanic population (Crouch and Jiandani 2012). With the Hispanic population of the U.S. steadily increasing at the fastest rate for any racial or ethnic group, it is important to ascertain the best way to educate LEP students and give them similar opportunities as their non-LEP peers. This study will add support and clarification to previous studies that have mentioned the effects of after-school programs on LEP students.

BACKGROUND

Limited English Proficiency Students

Low-income students are a common focus of research in examining the achievement gap, but minority and limited English proficiency (LEP) students are likely to experience inequalities to a different degree. For example, Hispanic students are the fastest growing minority group, and remain among the most segregated in schools largely due to the language gap (Ballentine 2001; Crouch and Jiandani 2012). LEP students not only suffer from language barriers, but also are disproportionately low-income and typically hold minority status (Crouch and Jiandani 2012). Thus, LEP students may face the most obstacles in academic attainment. Specifically, LEP students are less likely to participate in educational assistance programs because of the language barrier (Huang et al. 2008; Moore et al. 2000). Furthermore, it is more difficult for teachers to communicate with LEP parents (Huang et al. 2008; Moore et al. 2000). An important aspect of the situation is that not only are many LEP students language minorities, they may be recent immigrants and low income (Chu 2009). Perceptions of minority immigrants by teachers and school staff may include negative stereotypes that affect expectations teachers have for these students as well as their attitudes (Shavarini 1996). Research on teacher attitudes and expectations has shown that lower expectations can affect student performance negatively (Tsiplakides and Keramida 2010). Similarly, immigrant students' perceptions of teachers' and administrators' opinions of them affect immigrant students' achievement outcomes (Borjian and Padilla 2010). Some studies have found that LEP participants in after-school programs have made greater improvement in academic tests compared to their non-LEP counterparts (Nelson et al. 2007; Brown, McComb, and Scott-Little 2003). Therefore, it is important to continue to study LEP after-school participants and find out more about the types of programs that help most.

Why are LEP students behind? Among achievement gaps, the LEP gap is the greatest. Hispanics make up the second largest racial/ethnic group in the US (sixteen percent), and are steadily growing (Crouch and Jiandani 2012). In the fourth grade, seventy-six percent of Hispanic students are eligible for the national free or reduced lunch program, while only twenty-nine percent of Caucasian students are eligible for the program (Hemphill, Vanneman, and Rahman 2011). Overall, in 2011, thirty-four percent of Hispanic children were from families in poverty, and only twelve percent of Caucasian children were from poverty. Furthermore, a higher percentage of Hispanic students (thirty-seven percent) attend high-poverty schools than Caucasian students (six percent) (Aud et al. 2012). A report from the Early Childhood Longitudinal Study (ECLS) found that the achievement gap between Hispanic and Caucasian students has remained consistent since 1990 (Hemphill et al. 2011). They also reported that the gap is greater when the Hispanic students are LEP. The percentage of LEP students in the total population of schools in the US has risen since 2001 (Aud et al. 2012). Given their unique situation and great achievement gap, LEP students are important to examine. After-schools programs may serve to diminish educational inequalities. Before addressing this specific approach, it is important to cover the intellectual terrain regarding the role of schools in reducing inequality. Traditionally, research on the achievement gap has focused on the differences between African American and Caucasian students; however, inequalities across all racial and ethnic groups persist and are studied (Anderson, Medrich, and Fowler 2007). The LEP gap is becoming more important.

One way to understand the LEP gap is to apply the standard explanations for why there are educational inequalities in schools more generally. Two major approaches often frame this research: modernization theory and social reproduction theory (Collins 1971; Arum and Beattie 2000). First, built upon the functionalist theories in sociology, modernization theory posits that the goal of education is to teach foundational knowledge and skills, and works to diminish inequalities. The second major theory, cultural reproduction theory, which is consistent with conflict theory, argues that education does not necessarily improve students' social situations. Schools are not created equal (Arum and Beattie 2000), may actually legitimize inequality (Jencks et al. 2000; McNamee and Miller 2004), and maintain social stratification (Rothstein 2004). The dominant group, the upper- and middle-classes, structures the education system within which all must work, making it hard for subordinate groups to succeed. The dominant group maintains the status quo, keeping power in the hands of their own group by emphasizing their own class values and cultural knowledge and failing to remove hurdles to opportunities for disadvantaged groups (DeMarrais and LeCompte 1999; Demaine 2003). In this way, after-school programs may be a solution for LEP students and other disadvantaged students.

Other theories stem from conflict theory. A related perspective is Bourdieu's work on cultural capital (Bourdieu and Passeron 1990). Like cultural reproduction theory, the concept of cultural capital suggests the importance placed on upper- and middle-class social and cultural resources. Students from lower classes enter schools with a disadvantage, while the cultural resources of the middle class students resonate in the classroom. The more cultural resources to which a student has access (e.g. reading material, cultural opportunities), the more cultural capital the student brings to school (Lareau 2000). Thus, the education of the parents is correlated with the prospects of the child.

In Nelson's (2006) analysis of the income gap related to lower educational achievement among lower income students, she asserts three important obstacles: reading gap, conversation gap, and role model gap. First, the reading gap is caused by the limited reading resources of low-income children. Children of professionals are exposed to significant reading materials and their parents are more likely to have the time to dedicate to read to their children.

Second, the conversation gap is the result of less "constructive conversations" between low-income parents and their children. Kohn (1969) found that parents' discipline practices with their children were affected by their occupations, which also influenced the language used. Similarly, Hart and Risley (1995) studied the vocabularies of children and reported that those with professional parents had vocabularies fifty percent larger than those with working-class parents and twice as great as those in welfare households. These differences at home transcend into other environments, especially the classroom. Students from low-income homes have more academic obstacles to overcome than those from middle- and upper-class households (Lareau 2000). Third, the role model gap is acquired by the difference in types of grownups and networks to which children are exposed. Low-income students are less likely to have connections to those with college degrees and professional employment. This makes it more difficult for these students to receive guidance and assistance in climbing up the social and economic ladder.

The home environments and background characteristics of students is shown to be the greatest indicator of levels of academic skills (Downey and Gibbs 2010). Studies have investigated the academic gaps that arise after summer break and show that high- and low-income students make similar gains during the school year, therefore gaps in skills develop during summer vacations and non-school time (Downey and Gibbs 2010; Downey, von Hippel, and Broh 2004). Therefore, schools are not the sole cause of the achievement gap, but there are still ways schools may help diminish inequalities among social class groups.

Overall, the causes of the achievement gap are the result of both school-based and non-school factors, and evidence shows that certain reductions in the inequalities may be made by improved school-based policies (Borman and Cotner 2008). Rothstein (2004) calls for low-income and minority students to participate in out-of-school extracurricular experiences comparable to their middle-class peers in order to address the discrepancies in cultural capital. After-school programs may serve to dismantle the achievement gap.

Education Policy

Inequality in American schools did not always receive the attention it finds today. Even after the landmark *Brown vs. Board of Education* decision in 1954, little was done to actually change school systems though segregation was judged illegal (Borman and Cotner 2008). Lyndon B. Johnson's "War on Poverty" in 1965 stretched into education with the establishment of the Elementary and Secondary Education Act (ESEA). ESEA served to redistribute resources amongst schools serving low income and minority students. The next year, Coleman (1966) published "Equality of Educational Opportunity," commonly referred to as the "Coleman Report." He argued in his large study that desegregated schools improved schooling by exposing children to different cultures and lifestyles and higher expectations.

However, it was not until the 1983 publication of "A Nation at Risk" that the federal government expanded its role in education substantially (Borman and Cotner 2008). Before its publication, school systems were under the authority of local administrators, but the national government stepped in after claims of the American school failing its students. Under the Clinton administration, ESEA was reauthorized, and required performance standards to measure student achievement in core subjects. This was the first time accountability was mandated.

In 2002 Bush signed into law the No Child Left Behind Act of 2001 (Borman and Cotner 2008; Dynarski et al. 2003; James-Burdumy et al. 2005), which was an amendment to ESEA. NCLB increased the role of government by mandates at the state level through federal spending. The purpose of NCLB is “to close the achievement gap… so that no child is left behind” (Borman and Cotner 2008:245). The goal is for all children to be proficient in reading and math by the 2013-2014 school year. Responding to the pressures to meet specific standardized test levels, school districts have started programs to complement and supplement regular-day classrooms (Vanderhaar and Munoz 2006).

The federal government funds the establishment of 21st CCLC programs at schools throughout the country. The purpose is to create “community learning centers that provide academic enrichment opportunities during non-school hours for children particularly students who attend high-poverty and low performing schools” (21st Century 2012). 21st CCLC programs were first authorized under ESEA of 1995, but the focus was on communities (Jurich, Russell, and Frye 2009). It allowed the public to utilize schools and other government-owned buildings during non-work hours. In 1998 the program was changed to focus on extracurricular activities after school for public schools (James-Burdumy et al. 2005). The program was reauthorized again under Title IV, Part B of the No Child Left Behind Act of 2001. Funding grew from an appropriation of $40 million in 1998 to $1 billion in 2002, which is where it has continued (U.S. Department of Education, Office of Elementary and Secondary Education 2012: Dynarski et al. 2004). According to the 2009-2010 report, “Programs as a whole continue to fall below the established targeted performance thresholds associated with the GPRA performance indicators for the program" (Naftzger and Vinson 2011).

After-School Research

Most sociology of education research has neglected after-school programs, which have only been of particular interest in the last few decades (Little et al. 2007). However, theories in the sociology of education may be used to assess and improve out-of-school programs. Research on after-school programs is inconclusive, leading to ongoing debate over the "purpose and benefits" (Granger and Kane 2004; Little et al. 2007). Inconsistent findings on the effectiveness of after-school programs (Fashola 1998; Vanderhaar and Munoz 2006) may be related to analysis of different types of programs with different objectives (Huang et al. 2008; Jurich et al. 2009; Little et al. 2007; McComb and Scott-Little 2003). A meta-analysis conducted by Durlak and Weissberg (2007) suggested that the differences in program design and implementation leads to the differences in achievement results. Consequently, it is problematic to evaluate all programs in the same way.

There are four key areas of focus in after-school research: academic, social and emotional, prevention, and health and wellness (Little et al. 2007). The first emphasis, and most common, is on academic outcomes. Benefits that researchers have identified include improved reading and math scores (Goerge et al. 2007; Huang et al. 2008; Jenner and Jenner 2007; Klein and Bolus 2002; Lauer et al. 2006; Little and Harris 2003; Munoz 2002; Sheley 1984); better performances among participants compared to nonparticipants (Reisner et al. 2001; Vandell, Reisner, and Pierce 2007); improved school attendance (Fabiano et al. 2006; Huang et al. 2000); and reduction of suspension and dropout rates (Fabiano et al. 2006; Huang et al. 2000). However, many of these studies failed to find significant results (Huang et al. 2008; Jenner and

Jenner 2007; Little et al. 2007). Second, research on the social and emotional benefits has found that participation increases social and communication skills (Durlak and Weissberg 2007) and improves self-esteem (Phillips 1999; Taylor et al. 1999). For example, a study of the Go Grrrls program reported better body image in young female particpants (LeCroy 2003).

Third, research on the prevention outcome focuses on crime, drug and sex prevention. After-school hours are associated with the peak time for juvenile crime (Little, DuPree and Deich 2002; Newman et al. 2000; Zief, Lauver, and Maynard 2006) and other risky behaviors (Cohen et al. 2002). After-school programs were traditionally created to provide a safe environment and adult care for students while parents are at work (Kane 2004). Afterschool Alliance (2009) reported that, “More than 15 million school-aged children are on their own after school.” Studies found that participation in after-school programs was associated with reductions in teen pregnancies and sex (Philliber et al. 2002), alcohol use (Weiss and Nicholson 1998), substance use (Carter, Straits, and Hall 2006), and juvenile crime (Goldschmidt and Huang 2007). Less dramatic, after school participation leads to less television consumption, and also provides more time for learning and studying (Zief et al. 2006).

Lastly, research on health and wellness outcomes has found a variety of benefits. According to the Centers for Disease Control and Prevention, the rate of childhood obesity has more than tripled since 1980, with seventeen percent of U.S. children and youth over the 95th percentile for BMI (body mass Index) (Center for Disease Control and Prevention 2012; Carnell and Wardle 2008). Studies have found that after-school participation increases physical activity (Lauver 2002; Story et al. 2003; Yin et al. 2005), increases knowledge of healthy eating habits (Story et al. 2003; Yin et al. 2005), and reduces obesity (Mahoney, Lord, and Carryl 2005). In all, after school programs may play many different roles in the development of children and adolescents, but the most sought after outcome is educational attainment.

Overall, studies have shown that time management outside of regular-day school affects academic achievement in school (Guest and Schneider 2008). However, program analyses have found modest results at best. Granger and Kane (2004) published a summary of findings from four different programs, which included LA's BEST and 21st CCLC. The review found that some programs are delivering results, but the average program is in need of improvement at all levels. Furthermore, these studies have overlooked the growing LEP student population and the impact programs have on them.

21st CCLC findings. With increased federal funding of 21st CCLC programs, high quality assessments are required and needed to assist program improvement. Because under NCLB test scores are used to measure and evaluate successful schools, most after-school programs have created academic-based programs. Furthermore, one of the two most important objectives of the program is to offer activities to improve academic achievement, with the other objective to provide a safe environment after school (James-Burdumy et al. 2005). Educational achievement is the easiest outcome to measure, with every state required to have some type of end-of-year assessment.

In 2003, the first wave of evaluation of 21st CCLC by the Department of Education found few effects on academic success (Dynarski et al. 2003). There were no statistically significant effects on test scores after one year of participation. Reading scores saw less improvement than math scores. The final wave of the federal, longitudinal report was published in 2005, providing no more effect on academic outcomes (James-Burdumy et al. 2005). Likewise, Jenner and Jenner (2007) conducted an academic evaluation of 21st CCLC programs in Louisiana. Higher participation in programs was correlated with academic effects, but was not found to be significant. Another study in Delaware showed little difference in test scores between participants and non-participants (Jurich et al. 2009).

As with other programs, research on a 21st CCLC program suggests that consistent participation is associated with positive educational achievement (Ward et al. 2011). Evaluations of LA's BEST program have concluded that higher student participation increases the benefits of the program (Huang et al. 2008; Jenner and Jenner 2007; Lauer et al. 2006; McComb and Scott-Little 2003). Yet, participation problems persist. Typical participation is only one to two days a week, with many "drop-in participants," those that attend sporadically.

The Government Performance and Results Act (GPRA) indicators, the thresholds created by the federal government, remain unmet. However, recent evaluations suggest that more relevant indicators are needed to better assess the programs (Naftzger and Vinson 2011). A thorough examination of how the programs affect their targeted populations is needed to assess whether students with the greatest academic needs are able to make significant gains regardless of whether or not they meet the GPRA standards.

Effects on School Achievement Outcomes

As discussed, the influences on students' school achievement outcomes are more like a matrix of many factors than a straightforward, linear relationship. Ward (2005) constructed a conceptual model of the multiple effects on school outcomes. She identifies five types of influences that impact school outcomes: family characteristics, student attributes, school-related experiences, school context, and community context. Each type involves influences and dynamics associated with a particular social unit – individual, family, school, and community. Family characteristics are descriptive of a student's family, which includes the family's social class, human and cultural capital, and minority status. Student attributes include background characteristics of the student, such as gender, race and ethnicity, and socio-economic status. School related experiences incorporate aspects of participation such as relationships and attitudes as well as extracurricular activities. The last two types of influence are concerned with school context, including school resources, and ethnic and class composition, and community context, including opportunities, resources, and orientations toward schooling.

Student and family characteristics. Research has found that schools should not be solely blamed for the achievement gap (Downey, von Hippel, and Hughes 2008). Socioeconomic status (SES) and race are the two most important indicators of educational success and program participation (Littman 2001). A study at John Hopkins found that the unequal access to summer learning opportunities account for two-thirds of the learning gap between low- and high-income students (Afterschool Alliance 2012). Advantaged students are more likely than disadvantaged students to utilize assistance programs (e.g. homework help, academic workshops), and high-income students are more likely to participate and be more frequent participants in extracurricular activities (Vinovskis 1999).

Likewise, minorities face the same obstacles as low-income students. Studies have shown that gaps in educational achievement by race persist today (Fryer and Levitt 2006) and may begin before entering school (Jencks and Phillips 1998). As stated above, Hispanic students are the fastest growing minority group, and remain among the most segregated in schools largely due to the language gap (Ballantine 2001). Furthermore, LEP students participate in after-school programs less than non-LEP students due to the language barrier, which makes LEP parents less likely to communicate with teachers (Huang et al. 2008; Moore et al. 2000). However, previous after-school research shows that the gains for LEP participants are greater than non-LEP participants (Nelson et al. 2007; Brown et al. 2003).

Gender, on the other hand, has an inverse effect on academic achievement. Girls are reported to perform better in regular-day school, but in after-school programs they do not fare as well as boys (Huang et al. 2008; James-Burdumy et al. 2005; Jenner and Jenner 2007) and participate less than boys (Jenner and Jenner 2007; James-Burdumy et al. 2005).

School context. A 2010 report by the National Center for Education Statistics (NCES) found staggering differences between low- and high-poverty schools in which at least seventy-five percent of the students are eligible for the free or reduced lunch program (Aud et al. 2010). The graduation rates between the two differ greatly: high-poverty schools have an average graduation rate of sixty-eight percent while low-poverty schools have an average graduation rate of ninety-one percent. Similarly, fifty-two percent of graduates from low-poverty schools enrolled in four-year universities, whereas only twenty-eight percent of graduates from high-poverty schools enrolled. Furthermore, minority and limited English proficiency (LEP) students were more likely to attend high-poverty schools. The director of K-12 policy development at the Education Trust, Daria Hall, reported, “students in high-poverty schools start slow and are never able to catch up, due to lack of support both at home and at school” (Chen 2010).

The 21st CCLC program serves mostly low-income schools with large proportions of minority students. The program seeks to provide students with a more equal learning environment. Targeted students are less likely to graduate from high school and have overall lower test scores (James-Burdumy et al. 2005). The program seeks to alleviate the inequalities associated with high poverty school contexts.

After-school experiences. Most 21st CCLC after-school programs offer enrichment activities along with the academic classes. Academic classes focus on the core subjects, math and English, to assist students in end-of-year tests. Other academic classes present opportunities for students to work on homework and receive help from adults. On the other hand, enrichment classes serve to enhance student well-being. These classes serve to supplement the school day, especially since so many extracurricular classes are being dropped from school budgets (Jenner and Jenner 2007). Popular enrichment classes include choir, art, dance, sports, and orchestra.

In general, out-of-school activities are thought to lead to greater academic achievement and positive effects, though findings are inconsistent (Guest and Schneider 2008; Rothstein 2004). It has been argued that enrichment classes added to academic ones make for more effective programs, but not all research agrees on the most efficient focus (Kane 2004; Little et al. 2007). Higher socioeconomic students tend to participate in more enrichment activities, while students from lower income families are more likely to participate in academic ones (Guest and Schneider 2008). Rothstein (2004) argues that programs should provide enrichment classes that build up students, especially for those with low-income or minority group backgrounds and who are not able to receive such benefits elsewhere.

Study Goals

Many different methods have been employed to measure the effects of after-school participation on academic outcomes. Some have used test comparisons, such as pre-and posttests (Klein and Bolus 2002) or comparisons of scores at later time points with baseline test scores (Dynarski et al. 2003; James-Burdumy et al. 2005), and evaluations have compared participant test results to non-participants (Jenner and Jenner 2007; Reisner et al. 2001; Vandell et al. 2007). Most of these quasi-experimental research designs fail to find significant results. Some studies fail to offer evidence that the comparison-group students did not receive some sort of after-school care by an adult or program or show that participants would not have had supervision in the absence of the program (Huang et al. 2008; James-Burdumy et al. 2005). Selection bias makes inferring causality difficult. Similarly, most studies use binary outcome and dependent variables that measure whether or not there was academic improvement and whether or not a student participated (Jenner and Jenner 2007; Little et al. 2007). The degree to which improvement is made and the level of participation is not measured in these cases. Granger and Kane (2004) call for a more balanced outcome variable.

This study used two continuous outcome variables, English and math CRT score-change measures. The CRT scores before program participation, the baseline scores, were subtracted from the CRT scores after two years of consecutive program participation. Because evaluations typically have reported no significant improvements in test scores after one year of participation (Dynarski et al. 2003; Little et al. 2007), and claim that more participation yields greater academic achievement (Vandell et al. 2007), only students with two years of consecutive program participation were selected for this study. The federal evaluation used thirty days of participation as the minimum number to signify a program participant (Dynarski et al. 2003; Dynarski et al. 2004; James-Burdumy et al. 2005). Other evaluations, including those on 21st CCLC programs, utilize similar cutoff measures to distinguish program participants from “drop-in participant” (Huang et al. 2008; Jenner and Jenner 2007). However, other research has shown that any amount of participation may have a meaningful impact on academic achievement (Ward et al. 2010); thus, this study will include all students who participated at least once in each of two consecutive years.

The questions for this research focus on LEP participants, who have yet to be extensively examined given their unique educational standing. LEP students' academic gains will be assessed by background characteristics, after-school program type, and total amount of participation within school context. The following three research questions outline the main goals of this study:

1) Did the after-school program improve math and English CRT scores for LEP students after two years of consecutive participation, thus decreasing the achievement gap between LEP and non-LEP students?
2) Which program type benefited participants, especially LEP students, the most: academic-focused, enrichment-focused, or both?
3) Did higher frequencies of participation in the after-school program yield more positive gains?

These questions will not only evaluate a 21st CCLC program, but will further the research on after-school programs in general, especially for LEP students. I hypothesize that the more a student participates in the program over two years the better his or her academic improvement will be. Also, I argue that academic and enrichment participation will benefit students similarly since studies have shown that any kind of after-school participation has benefits (Guest and Schneider 2008; Rothstein 2004). Students that participate in both academic and enrichment activities have a more varied program experience and, thus, may profit most. Furthermore, I hypothesize that LEP participants will see greater improvements than their non-LEP peers as suggested by other research (Nelson et al. 2007; Brown et al. 2003). These students are the furthest behind, which gives them the most to gain.

METHODS

This case study will examine after-school programs in a school district from a medium-sized city in an intermountain state. It will include only the schools with 21st CCLC after-school programs, which comprises eight elementary and two middle schools that are eligible for Title I funding. Funding is given to low-income schools, which are defined as having at least forty percent of the students eligible for the free and reduced lunch program. This longitudinal data includes data from the 2006-07 school year to the 2010-11 school year. There are three different participation cohorts. Participants began the program in either the 2007-08, 2008-09, or 2009-10 school years. The particular school year in which the student entered the program is not of interest in this study. Table 1 shows demographic characteristics for each of the school populations averaged over the five school years. Averages for the ten schools show that fifty-seven percent of students qualified for the free or reduced lunch program. A little over sixty-one percent of students identified as Caucasian. Around thirty-two percent of the students identified as Hispanic, while less than seven percent identified as a different minority group. Additionally, twenty-seven percent of students were identified as LEP.

(Insert Table 1 Here)

Elementary and middle schools were both included in the study in order to include more cases, which is a strategy used in other studies (Vandell et al. 2007). Participants are included if they have two consecutive years of participation and CRT scores, one test score before participation and one after the two years of participation. For students with more than two years of program participation, the first two years were used. These criteria were used to create the dataset. Students begin to take state-standardized, end-of-year tests in third grade; however, there were some participants that had baseline test scores in first grade.

Each school is in charge of developing their program to meet the needs of their particular school. All after-school programs in this district have the same overarching goals, but program implementation is left up to the individual school. Each school has one site-coordinator to manage the after-school program and report activity levels to the district site-coordinator. The data on participation comes from the site coordinators' program reports and the school district. The district provided school statistics, student background characteristics, and student CRT scores.

Measures

Explanatory variables. Program participation is measured at the individual level. Site coordinators record participant attendance each day of the program. The total participation variable, therefore, is continuous and counts every day of participation over the two years for each student. The range of participation is from two days to 378 days of participation. Because the distribution of this variable is skewed (had a long right tail), the variable was logged. The variable is linear. It was tested for a quadratic effect and was found insignificant. Table 2 shows the descriptive statistics of total number of participation days over the two years, and also shows the differences between LEP and non-LEP students. LEP students averaged more days (99.24) than non-LEP students (75.28).

The after-school programs differ in activities offered, but they may be divided into two major categories, academic and enrichment. Because each school is able to create its own program, after-school programs focus on different types of activities. Some programs have mostly academic-focused activities, while others are more enrichment-focused; and some stress the importance of both academic and enrichment activities. The differences among the three types of participation, academic, enrichment, and both, make it necessary to separate the students by type of program participation. Dummy variables were created to determine the type of activities in which the students participated. Students with over sixty percent of their participation in either academic or enrichment were placed in that type of program. However, if participation was less than sixty percent and greater than forty percent for these two types of activities, the student was counted as both. Table 2 shows the descriptive statistics for all of the variables included in this study, including type of program focus (academic, enrichment, and both). Half of the students participated in mostly academic activities, while twenty-two percent participated in mostly enrichment and twenty-seven in both. A large proportion of LEP students (sixty percent) participated in academic activities compared to their non-LEP peers (forty-six percent).

(Insert Table 2 Here)

Moderating variables. All students are eligible to participate in the program, but most schools target low income, minority and LEP students for academic classes. Usually teachers refer students for the academic activities, which ensures that the students with the most need are given priority. Students targeted for academic activities are more likely to have low baseline CRT scores, leaving much room for improvement, while enrichment students tend to have higher baseline scores. Differences among types of after-school participation and CRT baseline scores and score changes are found in Table 3. This table not only shows the differences among the three types of participation, but also the differences for LEP participants. Again, it shows that LEP students underperform compared to their peers, especially those LEP students targeted for academic help.

(Insert Table 3 Here)

Background characteristics (gender, race and ethnicity, LEP status, and low-income status) reported by the school district are included as moderating variables. All these variables are included in after-school research (Fashola 1998; Granger 2004; Huang et al. 2008; Jurich et al. 2009), including the national 21st CCLC evaluations (Dynarski et al. 2003; James-Burdumy et al. 2005). Female (1=female, 0=male), LEP (1=LEP, 0=not LEP), and low-income (1=low-income, 0=not low-income) are dichotomous variables. The race and ethnicity variable is made up of three dummy variables (Caucasian, Hispanic, and other), and Caucasian as the reference group.

Control variables. As seen in Table 1, the schools have unique demographic characteristics. To control for school context, a school level variable was constructed to represent the different school each student attended during the second year of participation. Furthermore, middle schools and elementary schools also differ in program design and school context. Middle school students usually have more input in the type of activities in which they participate. Elementary students are generally placed in classes, especially academic ones. Therefore, a middle school variable was created (0=elementary school, 1=middle school) to control for the differences between the two types of participants. There are slightly more middle school participants in the sample (sixty-two percent). Student grade level is another control variable, which is the grade of the student during the second year of program participation. Typically CRTs begin in third grade, but some students are included with baseline CRT scores in first grade. The grade variable ranges from third to ninth grade.

Outcome variable. The key outcome variable is the CRT change score after two years of consecutive program participation. Each student in the school district is expected to have a math and English CRT score following testing at the end of the school year; however, there are 2,504 participants in the dataset with English CRT scores and only 1,984 participants with math CRT scores. Since differences have been found in the academic gains made in math and English test scores (Dynarski et al. 2004; James-Burdumy et al. 2005: Klein and Bolus 2002; Lauer et al. 2006; Little et al. 2007), CRT scores for math and English are analyzed separately. As mentioned above, this score is given as a percentage. In order to create the score change variable, the baseline CRT score before program participation is subtracted from the CRT score after two years of participation. This is done for both English and math.

Design and Analysis

This study used multilevel mixed-effects models to address the three main research questions. The linear models will include two levels of measurement, due to simultaneous analysis at the student and school levels. Raudenbush and Bryk (1986) argue that hierarchical modeling is necessary for studying school effects due to the need for multiple levels of analysis. This also allows for the explanation of school characteristics and student characteristics concurrently. The variance, tested by a likelihood-ratio test to see if two-level regression models are justified, indicated that the school-level variable is significant ($p<0.001$). The outcome variable, CRT change scores, and all the other moderating and control variables besides the school variable are measured at the student level.

Eight different models are estimated that include both English and math score change results. The first model is comprised of only the school level variable to check the random intercept and residual variance of school context. The second model includes LEP students, while the third model adds the other background characteristics (gender, low-income, and race and ethnicity). The fourth model brings in the middle school and grade variables. Model 5 includes the outcome variables: program type, enrichment and both, (academic is the reference group) and the logged total number of days in program. The sixth and seventh models add interaction terms with the outcome variables. Model six includes the interaction among the types of after-school activities and LEP students, while the seventh model includes the interaction between logged number of days in the program and LEP students. The last model contains the interaction term between middle school and LEP students.

FINDINGS

Much information is found in the descriptive statistics alone (found in Tables 2 and 3). Most t-tests in Table 2, comparing LEP and non-LEP participants, were significant, indicating that LEP and non-LEP participants have statistically significant differences. LEP students are more likely to come from low-income families and have minority status. Table 2 also shows the mean baseline English and math CRT scores and CRT change scores of the participants. LEP students have a negative score change value in math, while non-LEP students have a positive one, but these values are small and were not statistically different from one another. In contrast, English score changes were negative for both LEP and non-LEP participants, although changes for LEP students were significantly greater than non-LEP students.

Table 3 shows the means of the baseline CRT scores and CRT change scores for both English and math separated by the three different types of activity focuses for LEP and non-LEP participants. Participants in mostly academic-focused activities have the lowest mean baseline score for both math and English. In regard to change scores for math, academic participants have modest positive gains (0.210) over the two years, while participants in enrichment activities have negative gains (-1.470). Participants in both academic and enrichment activities have the most positive gains (1.143). Moreover, English results show that participants in both types of activities have the best change score (-0.751). Unlike math, academic participants have the most negative change score (-2.195) for English CRTs. However, this is not the case for LEP students. LEP participants have the most positive average English CRT score change when participating in mostly academic activities (-0.540). Similarly for math CRTs, academic-focused participation has the highest change score for LEP students. On the other hand, non-LEP students have better CRT change scores in math and English when participating in both types of activities (-1.491).

Tables 4 and 5 show the results from the regression models for math and English change scores. Model 1 for both tables shows the random intercept and residual variance of the school context variable. This shows that 10.93% of the variance is explained by school effect for English change scores and 12.25% for math change scores.

In Table 4, model 2 shows that LEP students have a higher score change compared to the reference group, non-LEP students. However, once the other background characteristics are added in model 3, LEP status has less of an effect and is not significant. Model 4 indicates that middle school participants have greater score changes than the reference group, elementary participants. In relation to type of participation, models 5 through 8 show that students who participate in a mix of academic and enrichment activities compared to academic activities experience greater change in math scores. However, the interaction terms between LEP and the participation variables show that LEP students are better off participating in academic-focused activities compared to participating in enrichment and both types of activities. The total number of days was not significant in any of the math models. Lastly, the interaction between LEP and middle school is significant and shows that middle school LEP students experience more beneficial score changes in math than non-LEP elementary students.

(Insert Tables 4 and 5 Here)

Findings for English CRT score changes differ greatly from math CRT score change results. In Table 5, LEP students do not have significantly different CRT score changes from non-LEP students when they are the only ones in the model (model 2); however, once the background variables are included (model 3), LEP status becomes significant and is associated with a more positive score change. Again, middle school participation is significant (model 4), but unlike the math results in Table 4, middle school students have a negative change score in English. Students in elementary school are making greater gains in English, while middle school students are making greater gains in math. Model five, including after-school participation variables, shows that students who participate in both academic and enrichment activities experience significantly greater change scores compared to those who participate in academic activities. The total number of days is associated with a slight score change increase. The interaction terms between LEP and participation type (model 6) show similar results to those found with math change scores; LEP students make greater gains in English when involved in mostly academic programs. However, these findings were less significant. In model 7 the interaction between LEP students and the logged number of days is significant. LEP students start off below non-LEP students, but make greater gains with more participation than non-LEP students. This finding was graphed in Figure 1. Model 8, including the interaction between LEP students and middle school, shows that LEP students benefit more in elementary school than in middle school. Overall for English, LEP elementary students make greater gains than middle school students.

(Insert Figure 1 Here)

DISCUSSION

The findings show how different math and English change score outcomes are. Descriptive statistics in Table 3 suggest that two years of consecutive participation does not make any positive difference in change scores. On average, the change score for math was 0.07 and -1.69 for English. Therefore, it is important to examine change scores controlling for different backgrounds and contexts. Other after-school program evaluations have neglected to find significant gains in academic achievement related to participation (Dynarski et al. 2003; James-Burdumy et al. 2005). Maybe one reason for this is that when examining all participants, effects are less apparent. Thus, after-school programs may seem to have little effect. However, examining the targeted groups shows that after-school programs have important benefits. Some previous research has looked at effects of after-school programs on targeted groups, especially LEP participants (Brown et al. 2003; Huang et al. 2008; Moore et al. 2000; Nelson et al. 2007), but the type of program was not specifically examined to find which is best for the target population.

Question 1 focused on the academic outcomes for LEP participants. For math, LEP students had a score change of -0.06, while non-LEP students had a higher score change of 0.12. For English, LEP participants had a score change of -0.4 while non-LEP students had a -2.25 score change. In both scenarios, LEP student scores were consistent over the two years, while non-LEP student scores declined in English and remained close to the same in math. However, some research argues that these modest results are not produced by poor programs, but rather indicate gains for students who are more at risk of falling behind due to the conditions of family life (Downey et al. 2008). Examining the different models clearly shows the significant strides LEP students make in English due to after-school participation.

Because the dataset only includes after-school participants, model 4 shows the significance of the after-school program in general on LEP students in both Tables 4 and 5. LEP is statistically significant for English CRT change scores, which shows that LEP after-school participants had greater gains than non-LEP participants. Conversely, LEP after-school participants were not typically statistically different from non-LEP participants for math CRT change scores. This corresponds with the t-tests in Table 2, which show that LEP and non-LEP participants only statistically differ in English CRT score change.

LEP students benefit differently in different contexts and programs. Question 2 asked which types of programs yield the greatest benefits. Overall, for both math and English scores, students who participate in a mix of academic and enrichment activities have an advantage over those who participate in mostly academic activities. Students spend around seven to eight hours a day in school and after-school participants spend another hour to two hours continuing to learn. It is a lot to ask of young students, so it may help for them to have a half hour or so to work on an enrichment activity before starting to work on academic material again. On the other hand, LEP students benefit most from focusing on academic activities. This may be because this is a time for them to work one-on-one or in small groups with a teacher, which helps them when they are struggling with understanding the learning material. It is important for administrators and site coordinators to realize that what seems best overall may not be the best educational approach for helping specific groups of participants. Previous studies found that any type of participation is beneficial, but more research is needed to answer which types actually help specific groups the most (Guest and Schneider 2008; Rothstein 2004).

The most significant context in this study is type of school: middle or elementary school. While this result was unexpected, it may be related to the different focuses these schools place on the after-school programs. The middle school after-school programs include an intervention approach to some of the academic activities offered after school. Students often attend academic activities when teachers or counselors perceive that students need extra help, especially in math. The middle schools usually offer a greater variety of enrichment activities than elementary programs and also focus on homework help classes rather than supplemental academic ones. Middle school participants are given more leeway in their participation. They are freer to come and go as they like and choose the types of classes they want to attend, which usually fall under enrichment. When students begin to fall behind in class work, they are taken out of the enrichment activities to catch up on academics.

On the other hand, elementary students are placed in classes, which are usually academic. Teachers refer elementary students with academic needs to the programs, so these students may be more at-risk compared to middle school students. Some middle school students are also referred but this is a smaller percentage compared to elementary students. It is interesting that increases in math CRT change scores are made in middle school, while increases in English CRT change scores are made in elementary school. This may occur because elementary schools focus on English, especially for LEP students. LEP elementary students usually have more opportunities and resources to receive help to overcome language barriers. Also, one of the middle schools in the sample has an award-winning math program. Participant observations in the middle school have shown that the most helpful academic help is in math. Furthermore, these differences may be the result of the different reasons for attending after-school. Students in elementary school need the academic help so they do not fall behind, but parents of middle school participants may use the program as a safe environment for the children after school. More research is necessary to differentiate among the various motives for participation. And again, further research should also keep in mind how other at-risk characteristics affect the differences between elementary and middle school participants.

Consistent participation in programs has been a key challenge in most studies (Kane 2004; Little et al. 2007). The national evaluation found that the average elementary student attends the program two to three days a week, while the average middle school student attends one day a week. Middle school students are less likely to return a second year, but elementary students are more likely to return the second year and have more consistent attendance throughout the year (James-Burdumy et al. 2005). In regard to the third research question, for math, the level of participation has less effect relative to other variables. Participation was never significant. Because type of program was found to yield the most gains, site coordinators concerned with students' math scores may want to improve the opportunities for participation for the students, rather than focusing on attendance. It may be more beneficial for students to have more of a drop-in as-needed approach to after-school when math assistance is needed. On the other hand, more participation is better for English change scores. Though modest, the more days of participation was found to be significant. One of the most important findings is that LEP students continue to make gains with greater participation (see Figure 2). LEP participants make negative score changes, which are lower than non-LEP participants, when participating less days; however, LEP participants surpass non-LEP participants with greater score changes as participation increases. This is an important finding. Site coordinators and administrators should encourage LEP students to continue in the program when English improvement is needed. In general, participants struggling in English should participate as much as possible in the program.

The national 21st CCLC evaluations find that programs continue to fall below the targeted targets (Naftzger and Vinson 2011). However, new goals should be established to convey benefits from the program. Gains may seem modest, but they are more meaningful than research portrays (Downey et al. 2008). Also, previous research has examined after-school participation across several years, which found differences in the impact of after-school for math and English scores. Huang et al. (2008) found in their assessment of LA's BEST program that higher levels or intensity of program participation affected math achievement growth more than English. That is similar to what was found in this study. Overall, greater academic gains were made in math CRT change scores, but when focusing on LEP students, English gains were found to be statistically significant and higher levels of participation had a greater effect on English change score gains than math.

Furthermore, research should continue to examine after-school programs with specific at-risk groups in mind and include interactions among types of participation and intensity of participation. This better shows who the program is helping and to what extent. However, academic outcomes are not the only benefits of after-school participation. Social and emotional, crime and drug prevention, and health and wellness outcomes should be studied in similar ways (Little et al. 2007).

CONCLUSION

In conclusion, this analysis indicates that the 21st CCLC program yields modest gains overall in academic achievement. However, further consideration suggests that the students benefitting from the program are at-risk students who may have fallen further behind otherwise. Students that are the furthest behind are making the most progress through the program. Furthermore, LEP students have different needs and benefit most from academic-focused programs compared to non-LEP students who benefit most from enrichment and academic activities. LEP participants also benefit more than non-LEP participants in English CRT score with higher levels of participation. It is important for program facilitators and researchers to examine the program benefits for LEP participants separately. Though academic attainment is the most used indicator of quality programs, new standards are warranted to show the intricacies of the program and all the other ways it may benefit students.

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Table 1: Demographic Characteristics of Schools with 21st CCLC After-School Programs.

Schools	Female	Low-Income	Caucasian	Hispanic	Other	LEP
Elementary schools						
A	0.496	0.544	0.676	0.268	0.055	0.214
B	0.524	0.782	0.454	0.492	0.052	0.449
C	0.481	0.418	0.735	0.198	0.066	0.157
D	0.494	0.630	0.611	0.322	0.067	0.253
E	0.482	0.726	0.472	0.440	0.086	0.415
F	0.475	0.576	0.613	0.327	0.058	0.305
G	0.491	0.770	0.454	0.477	0.068	0.468
H	0.506	0.342	0.775	0.146	0.079	0.122
Middle schools						
I	0.498	0.400	0.701	0.218	0.079	0.132
J	0.469	0.514	0.642	0.304	0.053	0.205
OVERALL	0.492	0.570	0.613	0.319	0.066	0.272

Table 2: Descriptive Statistics of Participants Including Comparisons of LEP and Non-LEP Mean Differences.

Variable Name	N	Metric	Description	Mean	S.D.	LEP		Non-LEP		*d*	*P*
						Mean	S.D.	Mean	S.D.		
LEP	2690	(0-1)	Limited English proficiency 0= non-LEP, 1= LEP)	0.29	0.46	1.00	0.00	0.00	0.00		
Controls											
Sex of child	2690	(0-1)	0= male, 1=female	0.50	0.50	0.41	0.49	0.54	0.50	-0.26	***
Low income	2690	(0-1)	Eligible for free and reduced lunch program 0= not low income, 1= low income	0.59	0.49	0.80	0.40	0.50	0.50	0.61	***
Race											
Caucasian	2690	(0-1)	0= not Caucasian, 1= Caucasian (non-Hispanic)	0.49	0.50	0.00	0.00	0.70	0.46	-1.40	***
Hispanic	2690	(0-1)	0= non-Hispanic, 1= Hispanic	0.44	0.50	0.93	0.26	0.23	0.42	1.40	***
Other	2690	(0-1)	0= Caucasian, Hispanic, 1= other	0.07	0.26	0.07	0.26	0.07	0.25	0.00	
Middle school	2690	(0-1)	Attended middle school at time of last CRT score 0= elementary school, 1= middle school	0.62	0.49	0.50	0.50	0.66	0.47	-0.33	***
Grade	2580	(3-9)	Grade of student at time of the last CRT	6.60	1.66	6.16	1.72	6.78	1.60	-0.37	***
Cognitive measures											
Math baseline CRT score	1984	(19-100)	CRT score before participation in an after-school program	73.32	17.79	61.79	18.77	78.24	14.86	-0.92	***
Math second CRT score	1984	(15-100)	CRT score after two years of continuous after-school program participation	73.39	18.01	61.73	19.23	78.36	14.90	-0.92	***

Math Score Change	1984	(-57-52)	Change between math baseline CRT score and second CRT score	0.07	14.29	-0.06	16.32	0.12	13.34	-0.01	
English baseline CRT score	2504	(24-100)	CRT score before participation in an after-school program	80.83	14.97	68.13	16.48	86.25	10.28	-1.21	***
English second CRT score	2504	(13-100)	CRT score after two years of continuous after-school program participation	79.14	15.52	67.73	17.6	84.01	11.51	-1.05	***
English Score Change	2504	(-48-59)	Change between English baseline CRT score and second CRT score	-1.69	11.39	-0.40	14.62	-2.25	9.64	0.16	***
After-school participation measures											
Academic	2690	(0-1)	Participated in over sixty percent academic-focused classes	0.50	0.50	0.60	0.49	0.46	0.50	0.28	***
Enrichment	2690	(0-1)	Participated in over sixty percent enrichment-focused classes	0.22	0.42	0.14	0.34	0.26	0.44	-0.29	***
Both	2690	(0-1)	Participated in forty to sixty percent of both academic- and enrichment-focused classes	0.27	0.45	0.26	0.44	0.28	0.45	-0.04	
Total days	2690	(2-378)	Total number of days of participation in the after-school program during the first two consecutive years	82.34	80.67	99.24	83.53	75.28	78.40	0.30	***

Table 3: Descriptive Statistics of CRT Scores for Different Types of After-School Participation.

Variable Name	Academic		Enrichment		Both	
	Metric	Mean	Metric	Mean	Metric	Mean
Math baseline CRT score	(19–100)	70.425	(26–100)	79.630	(26–100)	73.628
Math baseline CRT score for non-LEP participants	(22–100)	76.114	(31–100)	82.429	(37–100)	78.028
Math baseline CRT score for LEP participants	(19–98)	59.562	(26–100)	68.148	(26–98)	63.311
Math score change	(-57–52)	0.210	(-46–42)	-1.470	(-38–41)	1.143
Math score change for non-LEP participants	(-57–40)	-0.006	(-46–40)	-1.524	(-29–39)	2.048
Math score change for LEP participants	(-43–52)	0.621	(-32–42)	-1.250	(-38–41)	-0.980
English baseline CRT score	(24–100)	77.944	(28–100)	87.012	(24–100)	80.870
English baseline CRT score for non-LEP participants	(33–100)	84.794	(49–100)	89.084	(32–100)	85.895
English baseline CRT score for LEP participants	(24–99)	66.025	(28–100)	77.455	(24–97)	68.109
English score change	(-48–59)	-2.195	(-43–31)	-1.794	(-46–49)	-0.751
English score change for non-LEP participants	(-43–59)	-3.146	(-25–27)	-1.575	(-46–49)	-1.491
English score change for LEP participants	(-48–53)	-0.540	(-43–31)	-2.802	(-33–42)	1.129

Table 4: HLM Results for Students with Math CRT Score Change.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model7	Model 8
LEP		1.694*	0.778	0.839	0.903	2.593*	4.692†	-1.697†
Female			0.837	0.849	0.882	0.849	0.891	0.922
Low income			-1.046	-0.978	-1.030	-1.033	-1.069	-1.000
Hispanic			1.897*	1.889*	1.755*	1.741*	1.684†	1.511†
Other			-1.238	-1.261	-1.386	-1.361	-1.440	-1.582
Middle school				9.239***	9.583***	9.501***	9.550***	7.750**
Grade				0.282	0.304	0.351	0.297	0.266
Enrichment					0.360	1.390	0.279	0.120
Both					2.089**	3.354***	2.073**	1.984**
Total (ln)					0.346	0.301	0.563	0.315
LEP*enrichment						-3.651*		
LEP*both						-3.862*		
LEP*total (ln)							-0.891	
LEP*middle								6.270***
Residual variance	172.348***	171.755***	170.855***	170.839***	169.892***	169.173***	169.692***	167.992***
Random intercept	24.054	24.761	24.829	7.607	8.141	8.061	8.222	8.219

† p< .1
* p < .05
** p < .01
*** p < .001

Table 5: HLM Results for Students with English CRT Score Change

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
LEP		0.486	1.394*	1.660**	1.618*	1.960*	-7.953***	3.973***
Female			1.085*	1.118*	1.104*	1.086*	1.083*	1.066*
Low income			-0.109	-0.021	-0.100	-0.111	-0.108	-0.122
Hispanic			-1.106†	-1.038	-1.239†	-1.184†	-0.981	-1.026
Other			0.130	0.484	0.280	0.254	0.520	0.548
Middle school				-9.154***	-8.471***	-8.533***	-8.364***	-6.962***
Grade				0.256	0.280	0.315	0.313	0.300
Enrichment					-0.329	0.145	-0.218	-0.067
Both					1.460**	1.496*	1.444**	1.489**
Total (ln)					0.787**	0.775**	0.224	0.791**
LEP*enrichment						-2.239†		
LEP*both						0.023		
LEP*total (ln)							2.315**	
LEP*middle								-4.901***
Residual variance	112.422***	112.380***	111.888***	109.760***	108.565***	108.434***	107.394***	107.397***
Random intercept	13.804	13.585	13.677	2.142	1.868	1.824	1.560	1.770

† p< .1
* p < .05
** p < .01
*** p < .001

Figure 1: Interaction Between LEP and Total Number of Days of Academic After-School Participation