# Evaluation Report for Big Thought: Dallas City of Learning Student Outcomes

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SMU | Annette Caldwell Simmons School of Education & Human Development

Center on Research & Evaluation

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# Executive Summary

The Center on Research and Evaluation at Southern Methodist University completed an evaluation of Dallas City of Learning (DCoL), the summer learning ecosystem in Dallas, Texas that comprises over 2,700 different summer learning opportunities for Dallas youth each summer. Findings empirically indicate that summer learning matters, and it matters for youth that need it the most. Attending summer programming that is associated with DCoL positively impacts students' attendance and academic achievement. Specifically, there is a clear relationship between days of programming and these outcomes, indicating that the amount of programming matters – the more the better. Every little bit of summer programming does relate to better outcomes and the strongest and most consistent positive outcomes happen after about 30 days of programming, even when days are spread across 2 summers.

The objective of these analyses is to examine statistical associations between participation in summer programming and later student outcomes during the following school year(s). Six outcomes were explored: school attendance rates, beginning of year grade point average, STAAR reading, STAAR math, and Algebra 1 and English 1 End-of-Course exams.

Two types of analyses were conducted:

1. Within-group regression analyses to examine how days of dosage of summer programs predicts later outcomes when controlling for baseline performance, and
2. Between-group propensity score matching comparison analyses to examine differences in outcomes between students who participate in DCoL programming compared to a matched sample of students who did not participate in any programming[1].

These analyses give us our best-available estimate of the *unique* contribution of summer programs. The methods described here isolate the estimates of outcomes based on DCoL participation by controlling for prior performance and/or by using advanced methods to create a matched comparison group of non-DCoL students.

CORE has established 4 high-level takeaways and one note of important consideration related to the analyses conducted for this study:

1. Attending summer programs positively impacts students' attendance and academic achievement during the school year.
2. Dosage matters, and impacts really show up after about 30 days of programming.
3. One summer is good only if dosage is high in that single summer; two summers is best.
4. Summer programs matter most for kids who need it most, and DCoL programming is reaching those kids that need it.

STAAR is only one way of understanding the impact of summer programming. CORE discusses this further in this summary and at the end of the report.

**There is clear evidence that more summer programming is better.**
Results of the within-group analyses indicate a clear link – a linear relationship – between dosage of summer programming (in days) and outcomes for students overall. When controlling for the influence of prior achievement, we saw that as days of programming increases across two summers, so does:

[1] Comparison students had no programming according to DCoL enrollment and dosage records. It is possible that these students did receive programming undocumented by the DCoL system.

1. School attendance – particularly for middle school and high school students,
2. Beginning of year GPA for elementary and middle school students,
3. STAAR reading and math for elementary and middle school students, and
4. English 1 and Algebra 1 End-of-Course performance for high school students.

In addition to looking at the relationship between dosage and programming and later outcomes for participating students, we also compared the outcomes of DCoL participants and students that did not have documented participation in summer programs.

Propensity Score Matching (PSM) analyses aimed to balance the background variables of DCoL and non-DCoL students before comparing their outcomes. In other words, this strategy creates an "apples-to-apples" comparison group by approximating baseline equivalence. This helps ensure that any differences we see between the two groups in outcomes can be attributed to the program we are studying. Three series of PSM analyses were completed for 3 different program dosage levels: (1) any DCoL programming, (2) students with low dosage levels (students with dosage levels lower than 30 days), and (3) students with high dosage levels (students with dosage levels of 30 and higher).

Overall, the results of the comparison analyses are quite clear and in line with the within-group analyses which indicated that days of programming matters. When compared to a matched comparison group of students, students that enroll in summer programming are often more likely to outperform matched comparison students only when they have had at least 30 days of programming. These results are further intensified when a student receives 30 days of programming in a single summer. Specifically, students that participated in at least 30 days of summer programming across 2 summers have better school attendance, beginning of year GPA (elementary and middle school), and better STAAR reading and math achievement (elementary grades).

**One summer is good; two summers is better.**
When we looked at students who got back to back summers of programming, we saw the most consistently positive outcomes. Two summers together certainly reflects additional days or accumulating dosage but importantly, it also looks at the cumulative effect of having 2 back to back summers. Put otherwise, these analyses ask what happens when a student has two summers in a row where a summer slide has been prevented.

This is where we saw the strongest link between dosage of summer programming and STAAR outcomes. In these instances: For every 1 day of summer programming they participated in, elementary students were 2.5% more likely to pass STAAR math at the "approaches" level and 3.5% more likely to pass STAAR reading. High school students were 4% more likely to pass English 1 End-of-Course exams per 1 day of summer programming.

**Summer matters most for kids who need it most**
We were thinking of this in two ways. First, who are the students who need programming and are they accessing it? The students that are accessing DCoL programming represent an overall higher-needs group compared to their peers that do not access these programs. This is evidenced by lower attendance rates, lower GPAs, and lower STAAR passing rates prior to attending summer programs. The second question is who is benefiting from summer opportunities? In addition to looking at the overall effects for all students, we also isolated findings to specific groups of interest. Findings were more often positive and significant for African American and Hispanic students than for students that were white or from other races. This is a meaningful finding as we all grapple with how best to deliver culturally relevant and equitable programming.

**STAAR is only one way of understanding the importance of summer learning.**

CORE wrestles with a paradox in these findings. On one hand, STAAR matters. These scores are predictive of a number of desirable long term outcomes for students. Especially for students who are behind, the ability to show that summer programming can remediate and bring students back up to a more even playing field is incredibly important. These scores are a common language and a common metric that we can all use to make sure we are on the right track. From an evaluation standpoint, impacts on STAAR are a meaningful outcome for programs seeking to demonstrate their merit in the non-profit landscape.

On the other hand, STAAR is only one way of understanding the wide array of experiences and outcomes stemming from such a wide variety of educational offerings – throughout the summer and school year combined. We know that we are missing a lot of information when we focus on single metrics like this. We worry quite a lot that imposing STAAR as an accountability metric on summer programming could stifle the creativity and freedom that summer might otherwise afford. We talk about and think about how to mitigate this with leadership at Big Thought and across the city of Dallas.

These findings invite us to ask further questions about how summer learning might prime students for the school year – what if it is precisely the creative summer experiences that open up some learning pathways and allow a student to be more successful in a traditional learning environment when they come back to school in August? These findings challenge us to wrestle with questions about who has access to rich and varied experiences and whose access might instead get narrowed in favor of reading and math test prep at the exclusion of other opportunities. This is fundamentally about equitable access to a wide range of learning opportunities and life experiences. Who gets this access and who doesn't? How do we operationalize high quality summer programs across different disciplines and what role does this quality play in outcomes for kids? How do these outcomes vary for kids in creative programming compared to programming with an academic or remediation focus? These are both empirical and ethical questions that deserve all of our attention.

Year after year, we are broadening and deepening our ability to answer this question based on the power of the DCoL ecosystem. However, we still only have about 33% of the thousands of DCoL programs providing enrollment and dosage data about the students they are serving – this means we are working with a slice of the information, not the whole pie. Having only this "slice" matters for how we understand the full vision and the full potential of DCoL, as that of a robust out of school time ecosystem.

Just like biological ecosystems, healthy social ecosystems are characterized by vast diversity and abundance – by pathways that are varied and yet redundant. This means that if one pathway does not "work" there are multiple other pathways that one can take to get where they need to go. Even if life blocks many pathways, in a healthy system there are still more available. On the flip side, an impoverished ecosystem is one where there only a few, if any, pathways available.

Our findings on the DCoL ecosystem, taken cumulatively over time, show us that some of these pathways are indeed impactful – they are leading to positive academic outcomes for students. The findings are also an invitation to re-commit to ensuring that we are working together to keep growing rich and varied pathways, ensuring that students have a multitude of options available to them – not just one, not just a few-- and that the out of school ecosystem in Dallas is indeed as healthy and sustainable as we can make it.

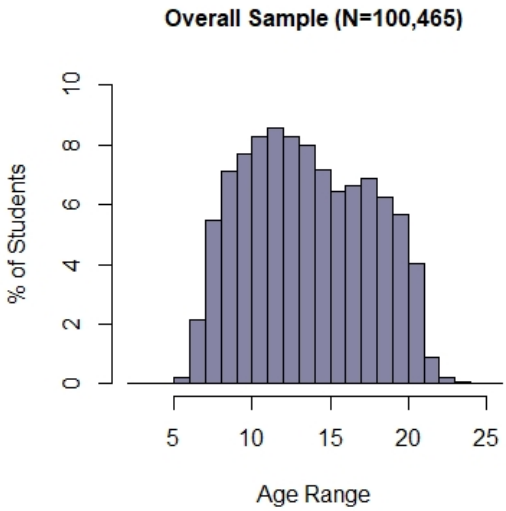
# Introduction

Dallas City of Learning (DCoL) is a public-private partnership between the City of Dallas, Dallas ISD, and Big Thought (also managed by Big Thought). DCoL is designed to ensure that all students have access to summer learning opportunities that stem summer learning loss and give students opportunities to explore and discover new interests, and receive needed supports. DCoL as a system builds a powerful network of neighborhood, community and city partners to connect students to valuable local resources.

CORE began partnering with Big Thought to evaluate DCoL in summer 2016. As the system as grown, deepened and evolved, so have the aims of the evaluation. This current report focuses on outcomes for Dallas ISD students that participate in DCoL-affiliated programs. Specifically, the analyses described here focus on approximately 100,000 Dallas ISD students across the 2016-17, 2017-18 and 2018-19 school years, and explores how outcomes for students across these years are associated with varying amounts participation, or no participation, in DCoL-affiliated summer programs.

# Student Sample

Descriptively, the sample of students included in these analyses is a representative sample of students enrolled across Dallas ISD; students are evenly distributed across ages and grade levels and the proportion classified as low-SES, special education and Limited English Proficient is aligned to the general district enrollment. The total sample size is 100,465 students; 51.6% are male, 68.6% are Hispanic, 24.2% are Black/African American, 4.5% are White, and 3.7% are of other races. The age of the students (as of November 2019) ranged between 2.9 years and 25.5 years with a mean/standard deviation of around 13 years-old. A histogram showing the distribution of students' age is presented in the figure to the right; the figure illustrates that the age of the students in the sample is normally distributed.




Students below 3rd grade in any of the three academic years (2016-17 through 2018-19) were excluded from the analyses. This decision was made because students below 3rd grade do not take the STAAR assessment and thus have incomplete data across the three years. The remaining grade levels were aggregated into Elementary (3-5), Middle (6-8) and High (9-12). Table One describes the number of students in each of these levels. This table includes all students in the study sample, both DCoL and non-DCoL.

***Table One.*** *Number of students with complete data records per school year; by grade band*

| Academic Year | Elementary | Middle | High |
|---|---|---|---|
| **2016-2017** | 25,873 | 20,548 | 23,369 |
| **2017-2018** | 23,555 | 19,623 | 22,576 |
| **2018-2019** | 20,200 | 18,822 | 21,357 |

Table Two describes the percent of students in the study sample that were categorized as low socioeconomic status (Low SES), special education (SPED), and limited English proficiency (LEP)

during each academic year. The majority of students are classified as Low SES and approximately 44% are LEP. SPED students' rates were between 8 to 10 percent across three academic years.

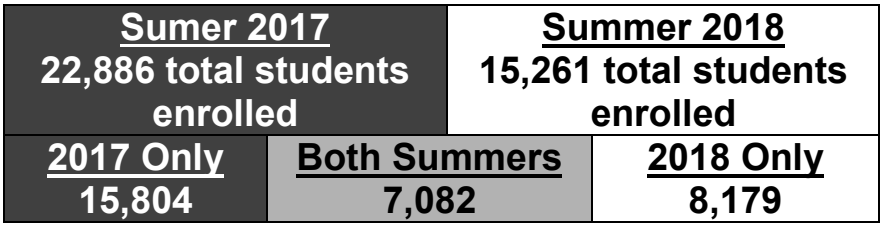
***Table Two.*** *Percent of sample students in demographic groups; by school year*

| Academic Year | Low SES | | SPED | | LEP | |
|---|---|---|---|---|---|---|
| | No | Yes | No | Yes | No | Yes |
| **2016-2017** | 20.6 | 79.4 | 92.2 | 7.8 | 56.6 | 43.4 |
| **2017-2018** | 22.7 | 77.3 | 90.9 | 9.1 | 55.2 | 44.8 |
| **2018-2019** | 20.5 | 79.5 | 89.4 | 10.6 | 55.7 | 44.3 |

## Demographic Description of DCoL Students & Non-DCoL Students

The overall sample described in the previous section included all student data that were provided by the Dallas Independent School District (DISD). The majority of the sample (69.1%) was comprised of students who did not roster in any of those programs (note: this does not conclude they participated in no summer programming, just that they weren't individually rostered into any DCoL programs). This non-participant group of students is referred to as "reference group" and labelled as "Non-DCoL Group", whereas the group of students who were enrolled in any programming are labelled as the "DCoL group". The reference group was used as a control group for the between-group analyses that were conducted to estimate the overall effect of summer programming on students' school attendance and academic achievement.

***Figure One.*** *Number of students enrolled in DCoL*




Approximately 30% of the overall sample attended at least one of the DCoL summer programs in any of the 2017 and/or 2018 summers; this is 31,065 unique students across three academic years. Half (50.9%) of those students attended only Summer 2017 programs, 26.3% of them attended only Summer 2018 programs, and 22.8% of them attended programs in both summers. The majority of the students attended only one program in each summer (93.2% of summer 2017 students and 83.6% of summer 2018 students). Nevertheless, it is worth noting that the percentage of the students who attended two programs increased from summer 2017 (6.2%) to summer 2018 (14.2%). Among the students who were enrolled in programming both summers, 22.7% of them attended three programs and 5.3% attended four or more programs across both summers.

Table Three describes the gender and race of the students in both groups. Gender is very similar among the DCoL and non-DCoL students. However, there was a higher rate of participation for males. Race percentages showed slight differences between the two groups. For example, the students enrolled in programs have more black and less white students than the pool of comparison students.

***Table Three.*** *Gender & race of students in DCoL and reference group; 2016-17 through 2018-19*

| | | N (%) | |
|---|---|---|---|
| | | DCoL Group | Non-DCoL (Reference) Group |
| **Gender** | Female | 14,016 (45.2%) | 34,585 (49.8%) |
| | Male | 17,004 (54.8%) | 34,815 (50.2%) |
| **Ethnicity** | Black | 8,363 (27%) | 15,923 (22.9%) |
| | Hispanic | 20,941 (67.5%) | 47,984 (69.1%) |
| | Other | 828 (2.7%) | 1,835 (2.6%) |
| | White | 888 (2.9%) | 3,654 (5.3%) |

Figure Two on the next page describes the distribution of student age for both the DCoL and non-DCoL groups. Compared to the age distribution of the combined sample described in the previous section, Figure One shows that the age of students enrolled in DCoL programs is not normally distributed. The age groups with the most students are between 10-13 and 16-17 years-old. The pool of comparison students are more normally distributed. The analyses were split by age groups (elementary, middle school, high school) to provide some control for these between group differences.

Table Four and Figure Three further disaggregate the percent of program and comparison students by grade-levels, low socio-economic status, special education, and limited English proficiency indicators. The percentage of students for all three indicators are consistently higher for students enrolled in DCoL programs. This shows that in all three academic years, the concentration of low SES, SPED, and LEP students enrolled in DCoL programs was higher than the comparison group. It is important to note that these numbers describe the sample during the academic years indicated, not from the summer program year.

***Figure Two.*** *Distribution of age of students in program and reference group as of November 2019*

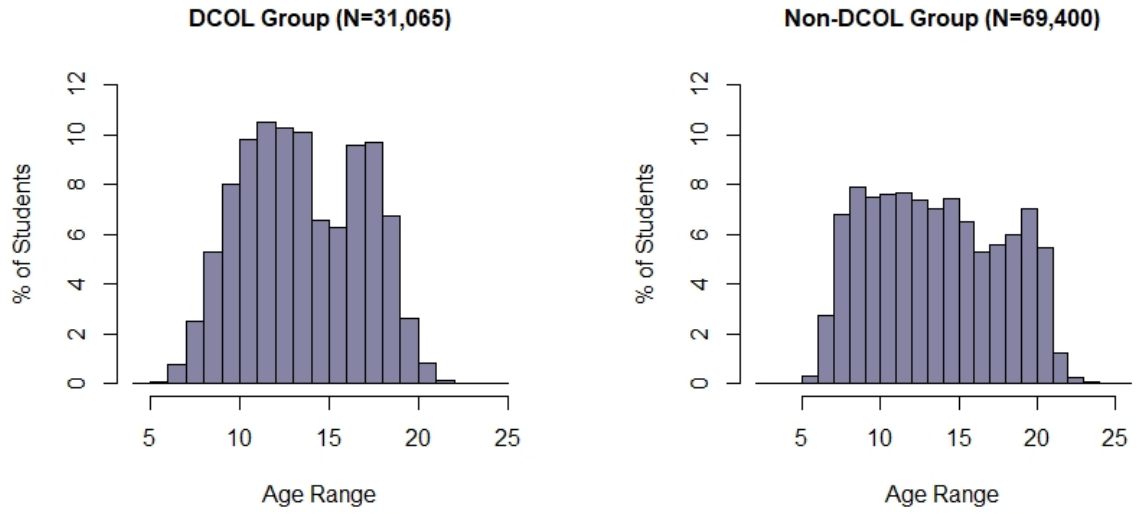
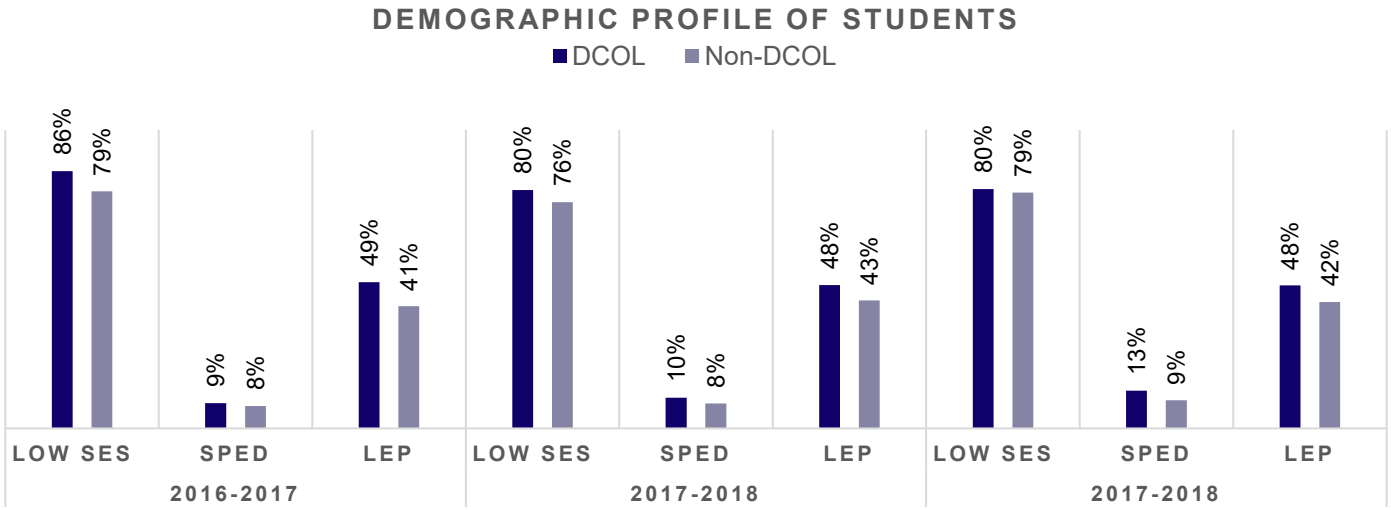



***Table Four.*** *Percent of sample students in demographic groups; by school year and treatment group*

| | | 2016-2017 | | 2017-2018 | | 2018-2019 | |
|---|---|---|---|---|---|---|---|
| | | **DCoL** | **Non-DCoL** | **DCoL** | **Non-DCoL** | **DCoL** | **Non-DCoL** |
| **Grade*** | Elementary | 32.6% | 22.7% | 32% | 19.6% | 26.7% | 17.1% |
| | Middle | 22% | 19.7% | 23.1% | 18% | 24% | 16.4% |
| | High | 17.9% | 25.7% | 28.6 % | 19.7% | 30.3% | 17.2% |
| **Low SES** | No | 13.8% | 20.6% | 20.1% | 24.2% | 19.8% | 21.0% |
| | Yes | 86.2% | 79.4% | 79.9% | 75.8% | 80.2% | 79.0% |
| **SPED** | No | 91.5% | 92.5% | 89.7% | 91.6% | 87.4% | 90.6% |
| | Yes | 8.5% | 7.5% | 10.3% | 8.4% | 12.6% | 9.4% |
| **LEP** | No | 51.0% | 59.1% | 52.0% | 57.1% | 52.1% | 57.7% |
| | Yes | 49.0% | 40.9% | 48.0% | 42.9% | 47.9% | 42.3% |

**%'s of the grade levels does not add to 100% because of removed 3rd and lower graders for each specific year.*

***Figure Three.*** *Percent of sample students in demographic groups; by school year and treatment group*




## Description of Achievement of DCoL Students & Non-DCoL Students

### Before Summer Programing (Baseline Description)

Table Five describes the achievement & performance of all sample students in the academic year before summer programing. The aim for creating a "pre-test" description is to provide information about the status of students prior to participating in the summer programs being studied. The academic years considered for each of the groups are:

- Summer 2017 only → Pre-test measures of 2016-2017 school year
- Summer 2018 only → Pre-test measures of 2017-2018 school year
- Both Summers → Pre-test measures of 2016-2017 school year

***Table Five.*** *Description of average achievement of students prior to summer programming*

| | Grade Level | Summer 2017 (2016-17 school year is described) | | Summer 2018 (2017-18 school year is described) | | Both Summers (2016-17 school year is described) | |
|---|---|---|---|---|---|---|---|
| | | DCoL | Non-DCoL | DCoL | Non-DCoL | DCoL | Non-DCoL |
| **Attendance %** | Elementary | 97% | 97% | 97% | 97% | 97% | 97% |
| | Middle | 95% | 97% | 95% | 96% | 96% | 97% |
| | High | 93% | 95% | 91% | 96% | 95% | 96% |
| **BOY GPA** | Elementary | 85.64 | 88.52 | 88.00 | 89.45 | 85.77 | 88.78 |
| | Middle | 82.37 | 86.18 | 84.39 | 87.16 | 83.17 | 87.45 |
| | High | 81.87 | 85.71 | 81.21 | 87.15 | 79.68 | 86.21 |
| **STAAR Reading Approaches %** | Elementary | 43% | 68% | 60% | 75% | 38% | 70% |
| | Middle | 45% | 72% | 61% | 76% | 39% | 73% |
| | High | | - | | - | | - |
| **STAAR Math Approaches %** | Elementary | 53% | 75% | 68% | 81% | 48% | 77% |
| | Middle | 53% | 76% | 65% | 81% | 46% | 80% |
| | High | | - | | - | | - |
| **STAAR English 1 Approaches %** | Elementary | | - | | - | | - |
| | Middle | | - | | - | | - |
| | High | 37% | 69% | 33% | 87% | 19% | 84% |
| **STAAR Algebra 1 Approaches %** | Elementary | | - | | - | | - |
| | Middle | | - | | - | | - |
| | High | 72% | 83% | 64% | 95% | 67% | 93% |

Figures Four through Seven provide a visual representation of the information in Table Five, summarizing the "pre-test" values for all outcomes explored in the analyses. It is clear from these figures that students that participate in DCoL programs are generally under-performing compared to the whole comparison group across all measures of achievement prior to summer programming. This is evidence that the DCoL system is reaching the students that it can most benefit, and is not reaching a "high-performing" population of Dallas youth. Therefore, in order to estimate baseline equivalence and ensure that observed effects are attributable to programming and not to "pre-existing" differences between these two groups of students, the weighting procedures used in the comparison analyses will correct these differences between the groups prior to estimating DCoL impact.

Specifically, for school attendance, elementary age students from each group have similar attendance, while DCoL students in middle and high school have lower attendance rates than the comparison group. For academic achievement, as measured by beginning of year (BOY) GPA and STAAR assessments, the comparison group was outperforming DCoL participants prior to summer programming across all grade levels.

***Figure Four.*** *Average school attendance rates in the year prior to beginning summer programming*

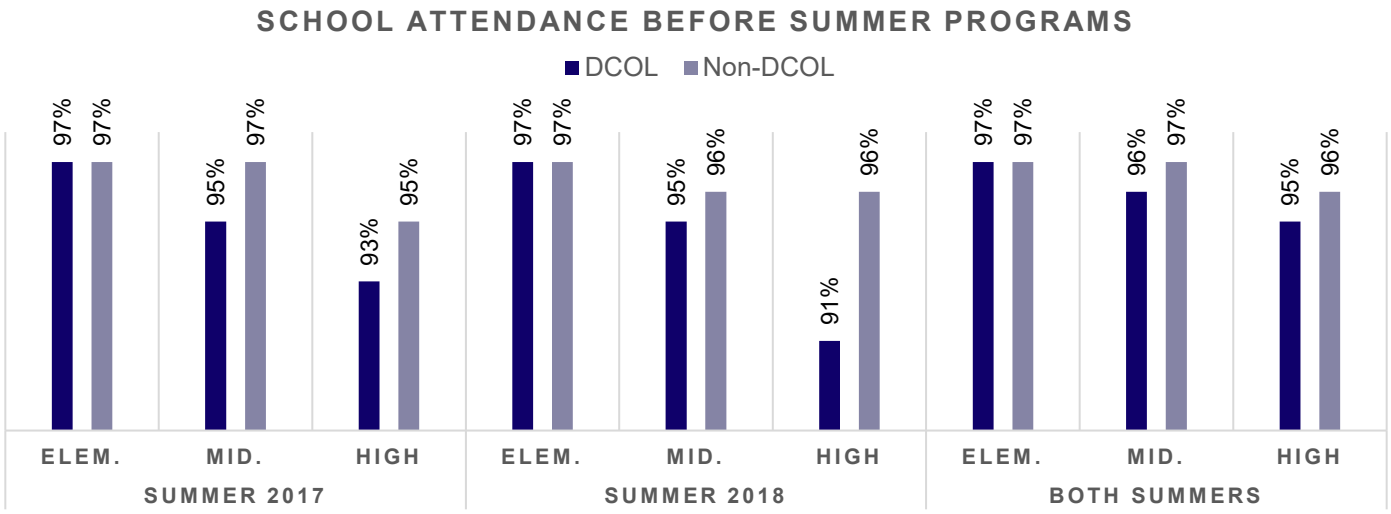



***Figure Five.*** *Average beginning of year GPA in the year prior to beginning summer programming*

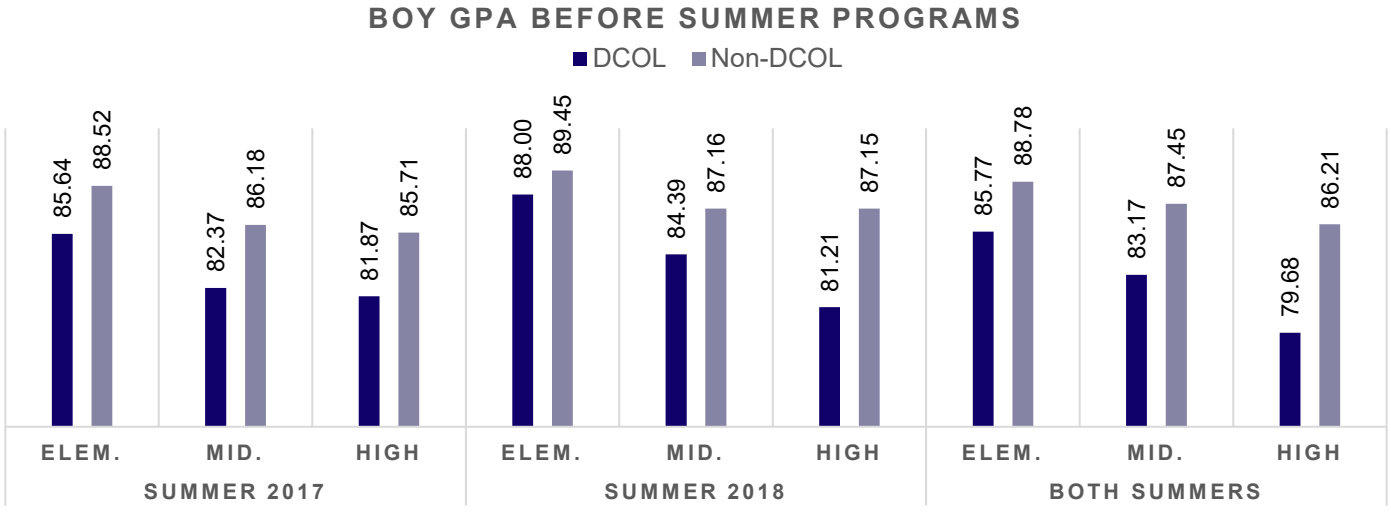


***Figure Six.*** *Percent of students meeting STAAR standards in the year prior to beginning summer programming*

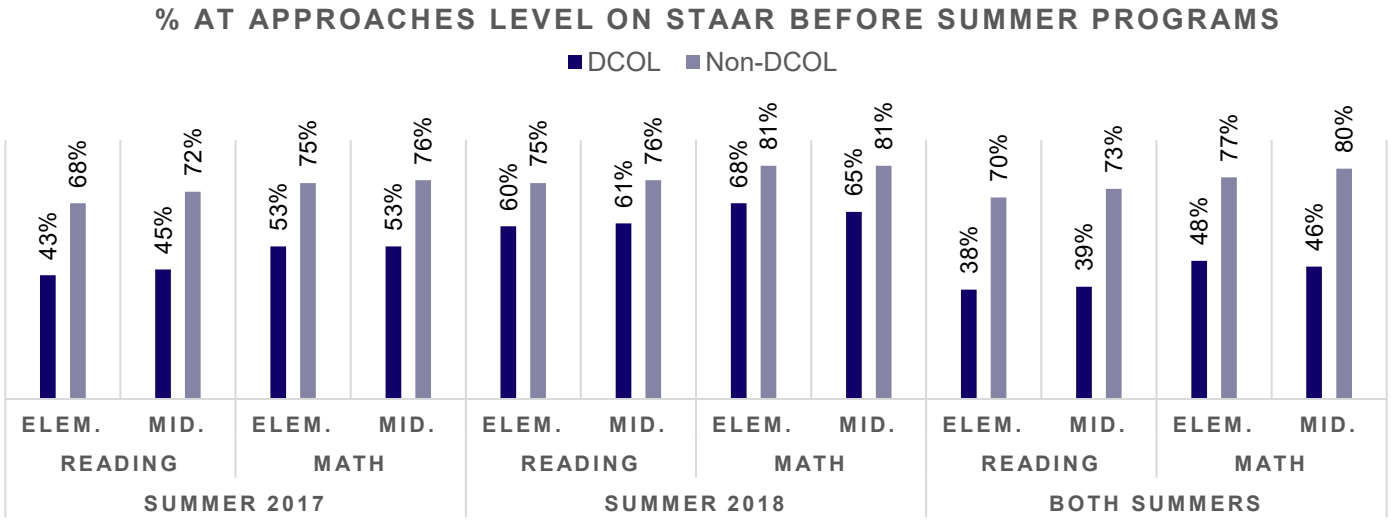
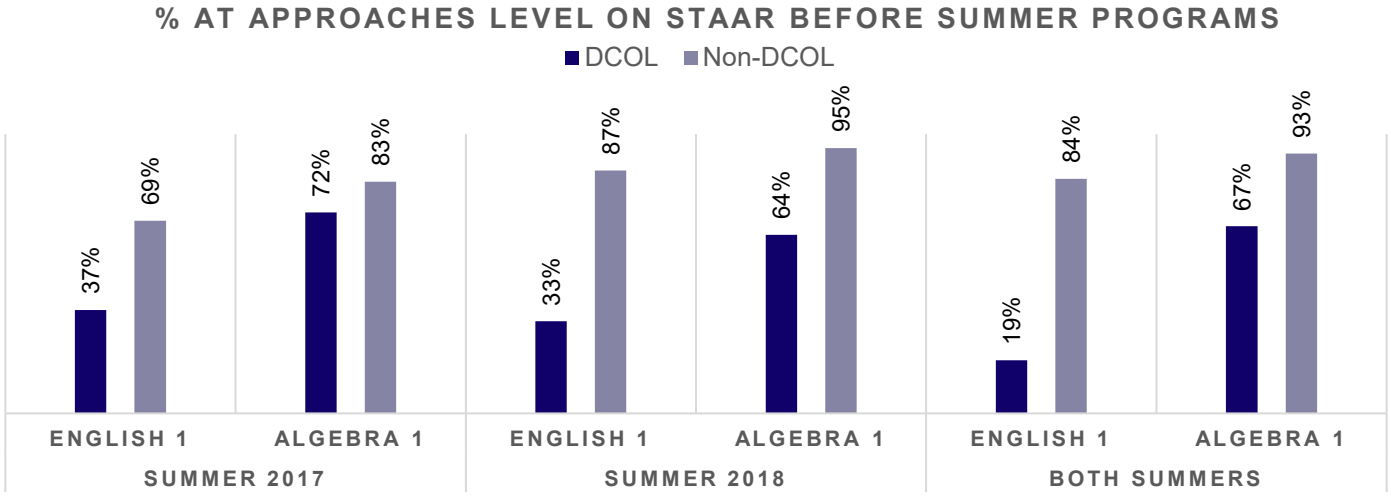



***Figure Seven.*** *Percent of students meeting STAAR EOC standards in the year prior to beginning summer programming*



## After Summer Programing (Prior to Matching)

***Table Six.*** *Description of average achievement of students prior to summer programming*

| | Grade Level | Summer 2017 (2017-18 school year is described) | | Summer 2018 (2018-19 school year is described) | | Both Summers (2018-19 school year is described) | |
|---|---|---|---|---|---|---|---|
| | | DCoL | Non-DCoL | DCoL | Non-DCoL | DCoL | Non-DCoL |
| **Attendance %** | Elementary | 97% | 97% | 97% | 97% | 97% | 97% |
| | Middle | 94% | 96% | 94% | 96% | 94% | 96% |
| | High | 90% | 93% | 89% | 94% | 89% | 94% |
| **BOY GPA** | Elementary | 87.15 | 89.07 | 88.00 | 89.23 | 86.99 | 89.23 |
| | Middle | 82.13 | 86.12 | 82.56 | 85.85 | 80.26 | 85.85 |
| | High | 83.11 | 87.14 | 79.91 | 85.84 | 78.81 | 85.84 |
| **STAAR Reading Approaches %** | Elementary | 64% | 80% | 68% | 80% | 60% | 80% |
| | Middle | 38% | 74% | 60% | 75% | 43% | 75% |
| | High | - | | - | | - | |
| **STAAR Math Approaches %** | Elementary | 72% | 86% | 76% | 85% | 70% | 85% |
| | Middle | 47% | 71% | 64% | 75% | 51% | 75% |
| | High | | - | | - | | - |
| **STAAR English 1 Approaches %** | Elementary | | - | | - | | - |
| | Middle | | - | | - | | - |
| | High | 52% | 77% | 31% | 68% | 23% | 68% |
| **STAAR Algebra 1 Approaches %** | Elementary | | - | | - | | - |
| | Middle | | - | | - | | - |
| | High | 72% | 85% | 47% | 87% | 44% | 87% |

Table Six above describes the achievement & performance of all sample students in the academic year after they completed summer programing. Outcomes of interest were school attendance, BOY GPA, and the percentage of the students who labelled as approached for the Reading, Math, English 1 and Algebra 1 STAAR. *These average performance indicators are simply descriptive; they do not control for program dosage nor for the confounding influence of prior performance*. The outcome measures for the three groups are:

- Summer 2017 only → Outcome measures of 2017-2018 school year
- Summer 2018 only → Outcome measures of 2018-2019 school year
- Both Summers → Outcome measures of 2018-2019 school year

# Methods and Findings

CORE completed 2 types of analyses. A total of 382 individual logistic regression models were used to estimate the effect of program dosage. These analyses included students that participated in DCoL only and was intended to explore how student outcomes were associated with each increased day of summer learning dosage. A total of 340 individual propensity score matching analyses were conducted to compare students that participated in DCoL programming with students with no documented program dosage.

Collectively, these analyses concluded in 4 high-level takeaways:

1. Attending summer programs positively impacts students' attendance and academic achievement during the school year.
2. Dosage matters, and impacts really show up after about 30 days of programming.
3. One summer is good only if dosage is high in that single summer; two summers is best.
4. Summer programs matter most for kids who need it most, and DCoL programming is reaching those kids that need it.

## The Effect of Program Dosage on Student Outcomes

The first set of analyses focuses only on students who attended summer programming within the DCoL system. CORE modeled the effect of program dosage (the total number of the days attended) on student outcomes after summer programming. All analyses except those for English 1 and Algebra 1 End of Course STAAR assessments controlled for the previous year's outcome.

In these analyses, STAAR achievement outcomes are all dichotomous (whether students performed at the "approaches" level or not). The attendance outcome was dichotomized in reference to 90% attendance threshold (higher than 90% or not). The BOY GPA is continuous and its scale was not changed (i.e., on a 0-100 scale). The predictor of interest in all models is the total days of programming and it was used in its original scale. *Thus, dosage effects summarized in this section are related to a 1-day increase of dosage.* Dosage in days is described in Table Seven.

***Table Seven.*** *Description of days of summer programming across summers*

| Cohort | Descriptive Statistics of Dosage in Days | | | | |
|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | Min | Max |
| **Summer 17 only** | 10.67 | 8 | 10.33 | 1 | 109 |
| **Summer 18 only** | 11.72 | 9 | 10.85 | 1 | 121 |
| **Both Summers** | 19.16 | 9 | 22.62 | 1 | 224 |

Because of the nature of the outcome variables multi-predictor linear regression was used for GPA, and multi-predictor logistic regression was used for the STAAR and attendance analyses. The findings are described in terms of how much the outcome itself or odds of achieving the outcome is predicted to increase per 1-day of program dosage. For BOY GPA, this is how much the GPA is predicted to increase per 1-day of programming after controlling for baseline GPA. For all attendance and STAAR, this is described as how much a student's odds of reaching the desired outcome increase per 1-day of programming after controlling for prior attendance rates or STAAR performance, as applicable.

The analyses for all 5 outcomes were each completed for 10 specific samples of students. The purpose of this design is to understand how the effect of summer program dosage uniquely affects specific groups of students. The 10 samples are:

1. All DCoL students
2. All students with dosage lower than 30 days

3. All students with dosage 30 days and higher
4. Students living in one of 10 zip codes with the most enrolled students
5. Students living in one of 10 zip codes with the least enrolled students
6. Black students
7. Hispanic students
8. Other Eth. students
9. White students
10. Non-LEP students
11. LEP students

Further, each set of analyses examined the effect of attending programming in summer 2017 only, summer 2018 only, and both summers. Findings are also disaggregated by grade levels.

A total of 396 individual predictive linear/logistic models were conducted. Of those 14 did not converge (i.e., analyses did not produce interpretable results) due to low sample size. Therefore, the findings describe the overall trends among the 382 successful models. Tables describing the statistical output of all dosage analyses are provided in Appendix A.

## Summary of Associations between Program Dosage and Outcomes

Among all 382 analyses, 73% resulted in a positive association between dosage and outcomes; 22% of all analyses resulted in a statistically significant positive association between dosage and outcomes (i.e., a result that outcomes improve as dosage increases). The outcome with the greatest proportion of positive and statistically significant findings was STAAR reading, with 31% of all analyses. The outcome with the lowest percent of positive findings was school attendance at just 11%.

A critical finding was that most positive and statistically meaningful associations between program dosage and outcomes were observed for the group of DCoL students that had participated in programming across *both* summers. When examining summer 2017 or 2018 dosage only, few meaningful associations were found for the overall group of participants. There are a few exceptions for sub-samples. These exceptions are described in Appendix A. Significant positive findings indicating dosage in one summer improved student outcomes was seen for:

- All middle school students for STAAR reading (p. 19)
- Middle school students with less than 30 days of programming for STAAR Math (p. 21)
- Middle school students with more than 30 days of programming for BOY GPA (p. 21)
- Elementary students with more than 30 days of programming for STAAR reading (p.21)
- Elementary students in high-access zip codes for BOY GPA (p.22)
- African American elementary students for STAAR reading (p.24)
- Hispanic middle school students for BOY GPA and STAAR reading & STAAR math (p.25 & 26)

These outcomes, for students that had programs across *both summers*, are *most consistently positive and statistically significant* for:

- Students *attending programs in zip codes with high program access and attendance* (92% of analyses for this group)
- Students that are *not LEP* (92% of analyses for this group)
- Students that are *African American* (83% of analyses for this group)
- Students that are *Hispanic* (67% of analyses for this group)

Overall, when examining findings across all sub-samples and outcomes for students that had programing *both summers*, the *strongest single findings* were observed for:

- LEP students: attendance for middle school, STAAR reading for elementary, and Algebra 1 for high school.
- Students in zip codes with high program access and attendance: English 1 for high school
- African American students: Algebra 1 for high school

These final bullet points are not generalizable to these groups of students overall. Rather, they highlight particularly noteworthy effects observed for specific groups of students on a few specific outcomes. For example, although some isolated findings for LEP students were among the strongest, non-LEP students more consistently had positive, albeit smaller on average, associations observed between dosage & all outcomes.

**Specific "impact statements" for some key summative findings are described below.** Table Eight summarizes the finding for each group of students for each outcome. Finally, it is worth nothing that findings are fairly consistent across age/grade levels. However, dosage is more likely to have a positive and significant effect on middle school students.

- Dosage has a positive and significant effect when combined across multiple summers.
    - Of all 36 analyses conducted using the entire group of DCoL students, 12 resulted in a positive and meaningful finding, and 11 of those 12 were for students enrolled in programs both summers.
- Among those that were in programming for two consecutive summers:
    - Middle school students' BOY GPA increases 0.24 grade points across 2 summers for every 1 day of programming.
        - Elementary students increase 0.06 grade points for every 1 day.
        - High school students decrease 0.15 grade points for every 1 day.
    - Middle school students' odds of not being chronically absent increases 2.3% for every 1 day of programming.
        - High school students increase .9% for every 1 day.
    - High school students' odds of passing the English 1 EOC exam increases 3.5% for every 1 day of programming.
    - High school students' odds of passing the Algebra 1 EOC exam increases 3.4% for every 1 day of programming.
        - This odds increase is slightly higher for African American students at 4% per 1 day.
    - Elementary students' odds of passing STAAR Reading increase 3% for every 1 day of programming.
        - Middle School students' odds increase 2.4% per 1 day.
    - Elementary students' odds of passing STAAR Math increase 2.6% for every 1 day of programming.
        - Middle school students; odds increase 1.2% per 1 day.

***Table Eight.*** *Findings of dosage analyses by sub-sample group; students that attended 2 summers*

| | Attendance | | | BOY GPA | | | EOC Alg1 | EOC Eng1 | STAAR Math | | STAAR Rdg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | elem | high | mid | elem | high | mid | high | high | elem | mid | elem | mid |
| Overall | ✓ | ✓* | ✓* | ✓* | ✗* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* |
| African Amer. | ✓ | ✓ | ✓* | ✓* | ✓ | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* |
| Hispanic | ✓ | ✓ | ✓* | ✓* | ✓ | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* |
| Other eth | n/a | ✓* | ✓ | ✓ | ✓ | ✓* | ✓* | ✓* | ✓ | ✓ | ✗ | ✓* |
| White | ✗ | ✓ | n/a | ✓* | ✓ | ✓ | n/a | ✓ | n/a | ✓ | n/a | ✓ |
| Dosage <30 | ✓ | ✗* | ✓ | ✓* | ✗* | ✓* | ✗ | ✗ | ✓* | ✓* | ✓* | ✓* |
| Dosage 30+ | ✓ | ✓ | ✓ | ✓* | ✓ | ✓* | ✓ | ✓* | ✓ | ✓ | ✓ | ✓* |
| High att zips | ✓ | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* |
| Low att zips | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✓ | ✓ |
| LEP | ✓ | ✓ | ✓* | ✓* | ✓ | ✓* | ✓* | ✓* | ✓ | ✓ | ✓* | ✓* |
| Non-LEP | ✓ | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* | ✓* |

✓ *indicates a positive association with summer program dosage*

✗ *indicates a negative association with summer program dosage*

* *indciates that the association is statistically signficant at p<.05.*

## Outcomes for DCoL Students Compared to Matched Non-DCoL Students

Propensity Score Matching (PSM) analyses aimed to balance the background variables of DCoL and non-DCoL students before comparing their outcomes. This helps ensure that any differences we see between the two groups in outcomes can be attributed to the program we are studying[2]. Three series of PSM analyses were completed for three different program dosage levels: (1) any DCoL programming, (2) students with low dosage levels (students with dosage levels lower than 30 days), and (3) students with high dosage levels (students with dosage levels 30 and higher).

CORE used gender, ethnicity, LEP, and low SES as demographic background variables to find a balanced comparison group. Importantly, the previous year's outcome measure (except for English 1 and Algebra 1) was also used as a pre-test measure. Similar to the dosage-effect analyses described previously in this report, STAAR Reading, Math, English1, Algebra 1 and attendance were dichotomous outcomes (pass/fail). In addition, the BOY GPA outcome was also dichotomized based on the analysis-specific subsample's median GPA value (higher than typical group GPA or not).

Results of these comparison analyses for the "all DCoL dosage" group (no dosage constraint) are summarized in Figure Eight. Results for the "high dosage" group (program dosage of 30 days or more) are summarized in Figure Eight. The legend in Table Nine describes the color codes for the summary figures. The usage of 30 days to split the analyses is based on a practical interpretation of 30 days equaling about 6 weeks of summer programming; *this is not an empirically derived dosage threshold.*

Overall, the results of the comparison analyses are quite clear. As seen in Figure Eight, when compared to a matched comparison group of students, students that enroll in *any* summer programming at any dosage level rarely out-perform a matched comparison group post-programming. One notable exception is with school attendance; students who attend any amount of programming across 2 consecutive summers have better school attendance rates than their peers.

When comparing only students with at least 30 days of programming to a matched comparison group, the impacts of summer programs become clear. As seen in Figure Nine, DCoL students are often more likely to outperform matched comparison students only when they have had at least 30 days of programming across a single summer or two summers.

These comparison analyses findings confirm the conclusions taken from the dosage analyses described previously – every day of program dosage matters and after about 30 days of summer programming (across two summers or within a single summer), results are more consistently positive in favor of DCoL participation.

[2] A technical report detailing the propensity score methods and procedures, including detailed statistical output of all analyses is available upon request. Please email dfarmer@smu.edu.

### *Guide for reading Figures Eight and Nine*

These heat maps describe the result of all 340 individual propensity score matching analyses. Each cell describes the result for an analysis, and the guides to the left, right, top and bottom of the grid describe the specific conditions of that individual cell. For example, in Figure Eight, the bright blue cell at the top left represents a positive and statistically significant finding for school attendance (left guide) in favor of DCoL participation for all (top guide) elementary (bottom guide) students that attended programming across both summers (right guide).

***Table Nine.*** *Key to interpret the comparison analyses summary in Figures Seven & Eight*

| Finding category | Students of DCoL Group are more likely to be successful in the target outcome. | Result is statistically significant |
|---|---|---|
| *4* | yes | yes |
| *3* | yes | no |
| *2* | no | no |
| *1* | no | yes |

***Figure Eight.*** *Summary of PSM comparison analyses for DCoL students of all dosage levels*

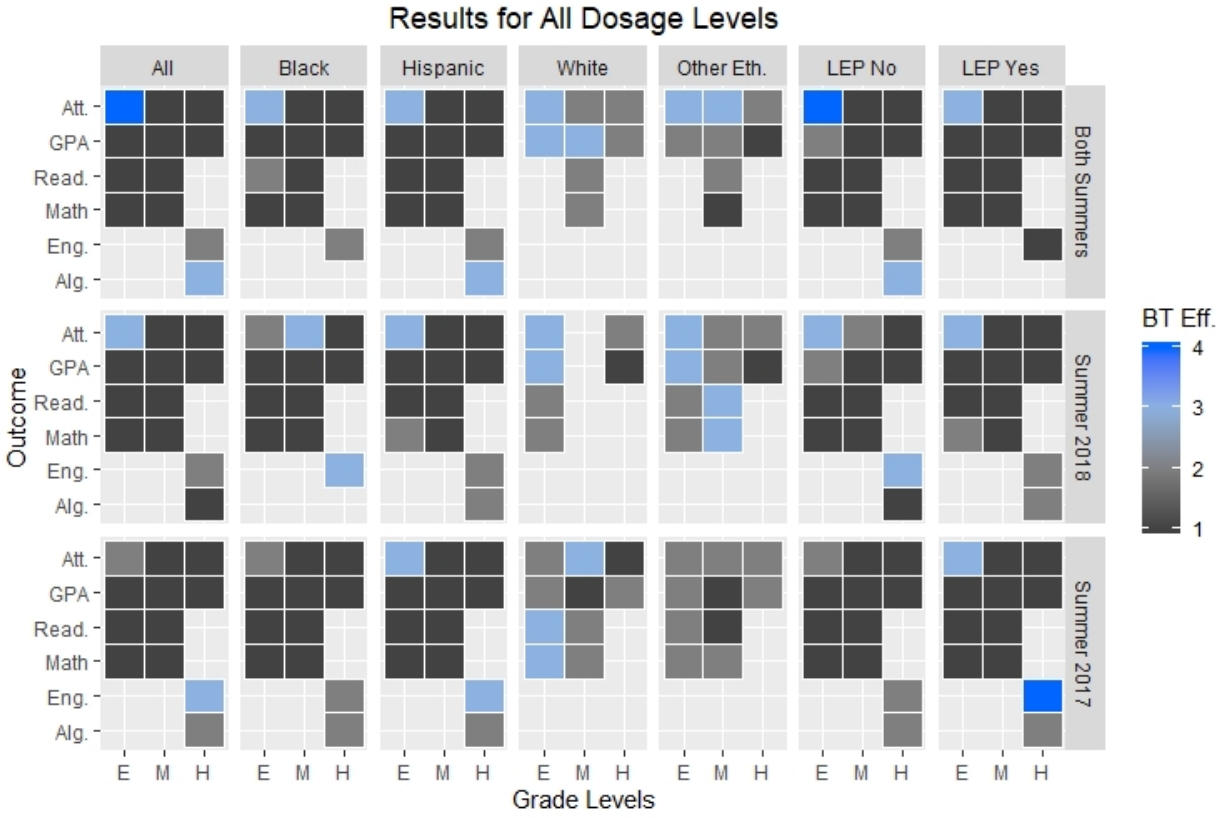
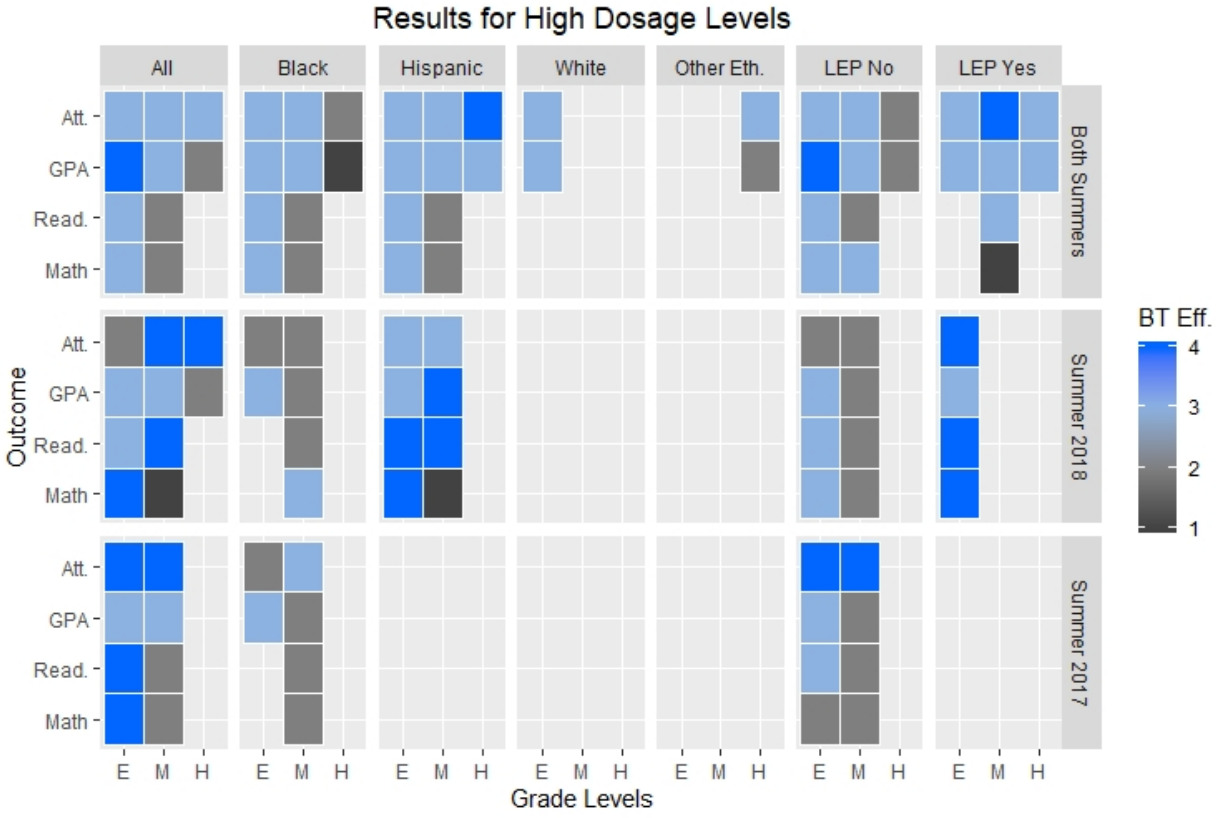


***Figure Nine.*** *Summary of PSM comparison analyses for DCoL students with dosage of 30 days+*




# Limitations and Conclusions

There are three main limitations that are critical to note when considering the implications of the findings in this report.

First is the reliability and validity of the dosage variable. As noted, there is no way to be sure exactly how many days of programming each student attended each summer. For DCoL students specifically, the number of days of programming is taken from attendance data provided by hundreds of summer programs. Therefore, it is reasonable to assume that there are days of dosage that are not captured in this data.

Second, DCoL only captures individual student program attendance data from approximately 30-35% of all summer programs. Therefore, it is clear that there are not only days of programming not being accounted for all participants, but there are also likely sizable groups of students attending summer programs that are not being accounted for. Nevertheless, the DCoL system includes a large number of summer programming in Dallas (approximately 2,500 programs each summer); the available DCoL sample does represent a large sample of summer programing across the city of Dallas and these analyses represent a reasonable estimate of the effects of summer programs. Taken together, the quality and accuracy of implementation data is limited and is a priority for continued improvement of the DCoL system as whole. These first two limitations speak to the need for continuous improvement of the DCoL system with a continued priority on improving technical assistance and tools to assist program partners in accurately and consistently rostering student enrollment and attendance.

Third, when interpreting the effect of a single experience of a student, two summers in this case, it is critical to consider other experiences that meaningfully contribute to student achievement. Prior achievement is, in most instances, the single strongest predictor of how a student will achieve at a later

time. By controlling for this prior achievement in these analyses (except for English 1 and Algebra 1 EOC exams), these estimates go far beyond simply describing trends and are our best estimate of the unique contribution of summer programs. However, other critical factors related to schools, teacher, families, and even neighborhoods contribute meaningful influence on student outcomes; this influence is critical cannot be discounted. These analyses do not control for those critical factors, so the findings should be interpreted cautiously.

Fourth, these findings are intended to estimate the effect of the average summer experience. The programs within the DCoL system are incredibly diverse in both quality and programming focus. Future analyses will focus on exploring how these outcomes are varied by the type of programs students are experiencing and will also consider the role of program quality.

Finally, CORE wrestles with a paradox in these findings given the reliance on STAAR scores as the single standardized academic outcomes measure available. On one hand, STAAR matters. These scores are predictive of a number of desirable long term outcomes for students. Especially for students who are behind, the ability to show that summer programming can remediate and bring students back up to a more even playing field is incredibly important. These scores are a common language and a common metric that we can all use to make sure we are on the right track. From an evaluation standpoint, impacts on STAAR are a meaningful outcome for programs seeking to demonstrate their merit in the non-profit landscape. On the other hand, STAAR represents a narrow outcome that represents a very small slice of student achievement. STAAR is only one way of understanding the wide array of experiences and outcomes stemming from such a wide variety of educational offerings – throughout the summer and school year combined.

# Appendix A. Output Tables for Dosage Effect Analyses

The tables in this appendix describe the statistical output for all dosage analyses (overall group, group with more than 30 days of dosage, and the group with dosage lower than 30 days). For the BOY GPA outcomes, the raw effect (Dos. Eff. column) can directly be interpreted as the amount of increase in the BOY GPA by 1-day increase in the dosage, controlling for the previous year's GPA. For all other outcomes, the dosage effect was estimated from a logistic regression model. Therefore, the amount of change in the odds ratio (Odds Dif. column) can be directly interpreted as the amount of increase/decrease in the odds of being successful by 1-day increase in the dosage (approaching for Reading, Math, English 1, & Algebra, having attendance more than 90% for Attendance, and having a higher GPA than the typical group value) in the model's outcome by controlling for previous year's performance.

For all model results, the first thing that needs to be examined is the statistical significance (Sig. column). Mentioned interpretations should be made for statistically significant analysis results, which were colored in green or red. Green colored results indicate a significant positive effect of dosage on the outcome, whereas the red colored results indicate a significant negative effect. It is important to note and consider sample sizes when making interpretations. Results for the extremely low sample sizes should be cautiously interpreted, even though the effect was found to be statistically significant.

### *1. DOSAGE EFFECT ANALYSES FOR THE OVERALL GROUP (NO RACE/LEP/DOSAGE BREAKDOWN*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 2,418 | **0.009** | 0.575 | No |
| | Middle | 1,002 | **-0.017** | 0.506 | No |
| | High | 201 | **0.043** | 0.443 | No |
| **Summer 2018** | Elementary | 1,820 | **-0.018** | 0.287 | No |
| | Middle | 809 | **-0.016** | 0.713 | No |
| | High | 3,284 | **-0.052** | 0.212 | No |
| **Both Summers** | Elementary | 1,122 | **0.061** | 0.015 | Yes |
| | Middle | 925 | **0.241** | 0.000 | Yes |
| | High | 2,735 | **-0.152** | 0.000 | Yes |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 2,679 | -0.002 | 0.871 | No | **-0.2%** |
| | Middle | 1,152 | -0.002 | 0.843 | No | **-0.2%** |
| | High | 248 | 0.005 | 0.783 | No | **0.5%** |
| **Summer 2018** | Elementary | 2,003 | -0.007 | 0.478 | No | **-0.7%** |
| | Middle | 924 | 0.006 | 0.548 | No | **0.6%** |
| | High | 3,286 | -0.008 | 0.258 | No | **-0.8%** |
| **Both Summers** | Elementary | 1,847 | 0.002 | 0.802 | No | **0.2%** |
| | Middle | 1,205 | 0.023 | 0.000 | Yes | **2.3%** |
| | High | 2,900 | 0.008 | 0.020 | Yes | **0.9%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,844 | 0.009 | 0.301 | No | **0.9%** |
| | Middle | 1,081 | 0.004 | 0.606 | No | **0.4%** |
| **Summer 2018** | Elementary | 1,378 | 0.012 | 0.070 | No | **1.2%** |
| | Middle | 894 | 0.014 | 0.029 | Yes | **1.4%** |
| **Both Summers** | Elementary | 761 | 0.03 | 0.001 | Yes | **3.0%** |
| | Middle | 1,183 | 0.023 | 0.000 | Yes | **2.4%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,844 | -0.008 | 0.389 | No | **-0.8%** |
| | Middle | 1,081 | 0.009 | 0.195 | No | **0.9%** |
| **Summer 2018** | Elementary | 1,378 | 0.008 | 0.282 | No | **0.8%** |
| | Middle | 893 | -0.001 | 0.882 | No | **-0.1%** |
| **Both Summers** | Elementary | 761 | 0.026 | 0.005 | Yes | **2.6%** |
| | Middle | 1,183 | 0.012 | 0.000 | Yes | **1.2%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 101 | 0.063 | 0.119 | No | **6.5%** |
| | Algebra 1 | 69 | 0.109 | 0.138 | No | **11.6%** |
| **Summer 2018** | English 1 | 1,468 | -0.005 | 0.635 | No | **-0.5%** |
| | Algebra 1 | 580 | -0.028 | 0.054 | No | **-2.7%** |
| **Both Summers** | English 1 | 1,929 | 0.035 | 0.000 | Yes | **3.5%** |
| | Algebra 1 | 685 | 0.034 | 0.000 | Yes | **3.4%** |

***2. DOSAGE EFFECT ANALYSES FOR THE OVERALL GROUP (NO RACE/LEP BREAKDOWN) WITH DOSAGE < 30 DAYS***

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 2,418 | **0.009** | 0.575 | No |
| | Middle | 1,002 | **-0.017** | 0.506 | No |
| | High | 201 | **0.043** | 0.443 | No |
| **Summer 2018** | Elementary | 1,820 | **-0.018** | 0.287 | No |
| | Middle | 809 | **-0.016** | 0.713 | No |
| | High | 3,284 | **-0.052** | 0.212 | No |
| **Both Summers** | Elementary | 1,122 | **0.061** | 0.015 | Yes |
| | Middle | 925 | **0.241** | 0.000 | Yes |
| | High | 2,735 | **-0.152** | 0.000 | Yes |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 2,585 | 0.027 | 0.304 | No | **2.7%** |
| | Middle | 1,079 | -0.001 | 0.962 | No | **-0.1%** |
| | High | 222 | 0.050 | 0.221 | No | **5.2%** |
| **Summer 2018** | Elementary | 1,826 | 0.000 | 0.995 | No | **0.0%** |
| | Middle | 825 | 0.002 | 0.909 | No | **0.2%** |
| | High | 3,243 | -0.040 | 0.000 | Yes | **-3.9%** |
| **Both Summers** | Elementary | 1,480 | 0.031 | 0.300 | No | **3.1%** |
| | Middle | 951 | 0.028 | 0.101 | No | **2.9%** |
| | High | 2,717 | -0.047 | 0.000 | Yes | **-4.6%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,787 | 0.023 | 0.129 | No | **2.3%** |
| | Middle | 1,015 | 0.000 | 0.989 | No | **0.0%** |
| **Summer 2018** | Elementary | 1,274 | -0.019 | 0.128 | No | **-1.9%** |
| | Middle | 798 | 0.006 | 0.674 | No | **0.6%** |
| **Both Summers** | Elementary | 641 | 0.053 | 0.002 | Yes | **5.5%** |
| | Middle | 930 | 0.046 | 0.000 | Yes | **4.7%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,787 | 0.014 | 0.440 | No | **1.4%** |
| | Middle | 1,015 | 0.039 | 0.002 | Yes | **4.0%** |
| **Summer 2018** | Elementary | 1,274 | -0.014 | 0.369 | No | **-1.4%** |
| | Middle | 797 | 0.019 | 0.141 | No | **1.9%** |
| **Both Summers** | Elementary | 641 | 0.063 | 0.003 | Yes | **6.5%** |
| | Middle | 930 | 0.049 | 0.000 | Yes | **5.0%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 92 | 0.048 | 0.305 | No | **4.9%** |
| | Algebra 1 | 63 | 0.105 | 0.178 | No | **11.0%** |
| **Summer 2018** | English 1 | 1,449 | -0.048 | 0.000 | Yes | **-4.7%** |
| | Algebra 1 | 569 | -0.085 | 0.000 | Yes | **-8.1%** |
| **Both Summers** | English 1 | 1,838 | -0.025 | 0.051 | No | **-2.4%** |
| | Algebra 1 | 643 | -0.018 | 0.257 | No | **-1.8%** |

### *3. DOSAGE EFFECT ANALYSES FOR THE OVERALL GROUP (NO RACE/LEP BREAKDOWN) WITH DOSAGE 30+ DAYS*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 84 | **0.053** | 0.074 | No |
| | Middle | 67 | **0.109** | 0.007 | Yes |
| | High | 25 | **-0.060** | 0.183 | No |
| **Summer 2018** | Elementary | 178 | **0.016** | 0.400 | No |
| | Middle | 98 | **0.078** | 0.037 | Yes |
| | High | 44 | **-0.014** | 0.864 | No |
| **Both Summers** | Elementary | 257 | **0.021** | 0.003 | Yes |
| | Middle | 248 | **0.029** | 0.008 | Yes |
| | High | 177 | **0.039** | 0.051 | No |

**Attendance**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 94 | 0.050 | 0.207 | No | **5.1%** |
| | Middle | 73 | -0.001 | 0.971 | No | **-0.1%** |
| | High | No sample data | | | | |
| **Summer 2018** | Elementary | 177 | -0.010 | 0.788 | No | **-1.0%** |
| | Middle | 99 | -0.028 | 0.235 | No | **-2.8%** |
| | High | 43 | 0.006 | 0.911 | No | **0.6%** |
| **Both Summers** | Elementary | 367 | 0.007 | 0.593 | No | **0.7%** |
| | Middle | 254 | 0.015 | 0.204 | No | **1.5%** |
| | High | 183 | 0.016 | 0.187 | No | **1.7%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 57 | -0.039 | 0.275 | No | **-3.9%** |
| | Middle | 66 | 0.008 | 0.774 | No | **0.8%** |
| **Summer 2018** | Elementary | 104 | 0.078 | 0.033 | Yes | **8.1%** |
| | Middle | 96 | 0.027 | 0.227 | No | **2.8%** |
| **Both Summers** | Elementary | 120 | 0.059 | 0.065 | No | **6.1%** |
| | Middle | 253 | 0.019 | 0.003 | Yes | **1.9%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 57 | 0.034 | 0.447 | No | **3.5%** |
| | Middle | 66 | 0.020 | 0.376 | No | **2.0%** |
| **Summer 2018** | Elementary | 104 | 0.012 | 0.697 | No | **1.2%** |
| | Middle | 96 | -0.026 | 0.108 | No | **-2.5%** |
| **Both Summers** | Elementary | 120 | 0.049 | 0.068 | No | **5.0%** |
| | Middle | 253 | 0.005 | 0.317 | No | **0.5%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 9 | 0.000 | 1.000 | No | **0.0%** |
| | Algebra 1 | 6 | 0.000 | 1.000 | No | **0.0%** |
| **Summer 2018** | English 1 | 19 | -0.001 | 0.979 | No | **-0.1%** |
| | Algebra 1 | 11 | 0.076 | 0.459 | No | **7.9%** |
| **Both Summers** | English 1 | 91 | 0.047 | 0.008 | Yes | **4.8%** |
| | Algebra 1 | 42 | 0.089 | 0.068 | No | **9.3%** |

### *4. DOSAGE EFFECT ANALYSES FOR THE 10 ZIP CODES WITH HIGH PROGRAM ACCESS (NO RACE/LEP BREAKDOWN)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,623 | **0.028** | 0.022 | Yes |
| | Middle | 623 | **0.013** | 0.423 | No |
| | High | 124 | **0.016** | 0.583 | No |
| **Summer 2018** | Elementary | 1,222 | **0.009** | 0.392 | No |
| | Middle | 547 | **0.040** | 0.136 | No |
| | High | 2,106 | **-0.042** | 0.284 | No |
| **Both Summers** | Elementary | 879 | **0.031** | 0.000 | Yes |
| | Middle | 668 | **0.077** | 0.000 | Yes |
| | High | 1,780 | **0.044** | 0.015 | Yes |

**Attendance**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,736 | 0.014 | 0.489 | No | **1.4%** |
| | Middle | 664 | -0.005 | 0.738 | No | **-0.5%** |
| | High | 133 | 0.025 | 0.415 | No | **2.5%** |
| **Summer 2018** | Elementary | 1,228 | -0.006 | 0.715 | No | **-0.6%** |
| | Middle | 569 | 0.016 | 0.272 | No | **1.6%** |
| | High | 2,104 | -0.013 | 0.206 | No | **-1.3%** |
| **Both Summers** | Elementary | 1,195 | 0.000 | 0.975 | No | **0.0%** |
| | Middle | 697 | 0.022 | 0.007 | Yes | **2.2%** |
| | High | 1,807 | 0.011 | 0.040 | Yes | **1.1%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,205 | 0.010 | 0.411 | No | **1.0%** |
| | Middle | 623 | 0.002 | 0.797 | No | **0.2%** |
| **Summer 2018** | Elementary | 844 | 0.013 | 0.136 | No | **1.3%** |
| | Middle | 550 | 0.014 | 0.153 | No | **1.4%** |
| **Both Summers** | Elementary | 494 | 0.033 | 0.008 | Yes | **3.4%** |
| | Middle | 682 | 0.028 | 0.000 | Yes | **2.8%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,205 | -0.010 | 0.442 | No | **-1.0%** |
| | Middle | 623 | 0.013 | 0.111 | No | **1.3%** |
| **Summer 2018** | Elementary | 844 | 0.014 | 0.187 | No | **1.4%** |
| | Middle | 550 | -0.007 | 0.376 | No | **-0.7%** |
| **Both Summers** | Elementary | 494 | 0.024 | 0.043 | Yes | **2.5%** |
| | Middle | 682 | 0.013 | 0.001 | Yes | **1.3%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 49 | 0.057 | 0.243 | No | **5.9%** |
| | Algebra 1 | 32 | 0.100 | 0.210 | No | **10.6%** |
| **Summer 2018** | English 1 | 946 | 0.005 | 0.693 | No | **0.5%** |
| | Algebra 1 | 394 | -0.072 | 0.001 | Yes | **-7.0%** |
| **Both Summers** | English 1 | 1,200 | 0.039 | 0.000 | Yes | **4.0%** |
| | Algebra 1 | 387 | 0.036 | 0.000 | Yes | **3.7%** |

### *5. DOSAGE EFFECT ANALYSES FOR THE 10 ZIP CODES WITH LOW PROGRAM ACCESS (NO RACE/LEP BREAKDOWN)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 79 | **0.020** | 0.577 | No |
| | Middle | 34 | **0.102** | 0.065 | No |
| | High | 9 | **-0.072** | 0.827 | No |
| **Summer 2018** | Elementary | 90 | **0.057** | 0.052 | No |
| | Middle | 27 | **-0.013** | 0.885 | No |
| | High | 128 | **-0.309** | 0.184 | No |
| **Both Summers** | Elementary | 67 | **0.032** | 0.165 | No |
| | Middle | 40 | **0.006** | 0.911 | No |
| | High | 126 | **0.152** | 0.124 | No |

**Attendance**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | **No sample data** | | | | |
| | Middle | 39 | 0.000 | 1.000 | No | **0.0%** |
| | High | 9 | 0.000 | 1.000 | No | **0.0%** |
| **Summer 2018** | Elementary | 91 | 0.040 | 0.639 | No | **4.1%** |
| | Middle | 28 | 0.436 | 0.200 | No | **54.7%** |
| | High | 129 | -0.077 | 0.238 | No | **-7.4%** |
| **Both Summers** | Elementary | 94 | 0.124 | 0.731 | No | **13.2%** |
| | Middle | 42 | 0.105 | 0.303 | No | **11.1%** |
| | High | 125 | 0.048 | 0.231 | No | **4.9%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 61 | 0.100 | 0.415 | No | **10.5%** |
| | Middle | 35 | 0.050 | 0.515 | No | **5.1%** |
| **Summer 2018** | Elementary | 60 | 0.001 | 0.983 | No | **0.1%** |
| | Middle | 28 | 0.141 | 0.247 | No | **15.1%** |
| **Both Summers** | Elementary | 38 | 0.009 | 0.829 | No | **0.9%** |
| | Middle | 40 | 0.015 | 0.365 | No | **1.5%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 61 | 0.007 | 0.946 | No | **0.7%** |
| | Middle | 35 | 0.137 | 0.148 | No | **14.7%** |
| **Summer 2018** | Elementary | 60 | -0.041 | 0.462 | No | **-4.0%** |
| | Middle | 28 | 0.123 | 0.090 | No | **13.0%** |
| **Both Summers** | Elementary | 38 | -0.066 | 0.619 | No | **-6.4%** |
| | Middle | 40 | -0.001 | 0.930 | No | **-0.1%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 5 | 0.000 | 1.000 | No | **0.0%** |
| | Algebra 1 | 4 | 0.000 | 1.000 | No | **0.0%** |
| **Summer 2018** | English 1 | 57 | -0.059 | 0.489 | No | **-5.7%** |
| | Algebra 1 | 17 | -0.058 | 0.622 | No | **-5.6%** |
| **Both Summers** | English 1 | 77 | 0.027 | 0.513 | No | **2.7%** |
| | Algebra 1 | 31 | -0.855 | 0.243 | No | **-57.5%** |

### *6. DOSAGE EFFECT ANALYSES FOR AFRICAN AMERICAN STUDENTS (NO LEP BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 498 | **-0.006** | 0.691 | No |
| | Middle | 344 | **-0.034** | 0.115 | No |
| | High | 101 | **0.011** | 0.833 | No |
| **Summer 2018** | Elementary | 403 | **0.031** | 0.060 | No |
| | Middle | 271 | **0.019** | 0.575 | No |
| | High | 847 | **-0.076** | 0.077 | No |
| **Both Summers** | Elementary | 320 | **0.027** | 0.008 | Yes |
| | Middle | 403 | **0.051** | 0.000 | Yes |
| | High | 689 | **0.010** | 0.662 | No |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 570 | -0.003 | 0.791 | No | **-0.3%** |
| | Middle | 397 | 0.002 | 0.886 | No | **0.2%** |
| | High | 116 | -0.018 | 0.502 | No | **-1.8%** |
| **Summer 2018** | Elementary | 404 | 0.001 | 0.950 | No | **0.1%** |
| | Middle | 278 | -0.008 | 0.594 | No | **-0.8%** |
| | High | 836 | -0.006 | 0.593 | No | **-0.6%** |
| **Both Summers** | Elementary | 430 | 0.006 | 0.464 | No | **0.6%** |
| | Middle | 409 | 0.014 | 0.043 | Yes | **1.4%** |
| | High | 677 | 0.008 | 0.178 | No | **0.8%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 365 | 0.019 | 0.142 | No | **1.9%** |
| | Middle | 354 | 0.009 | 0.384 | No | **0.9%** |
| **Summer 2018** | Elementary | 266 | 0.028 | 0.022 | Yes | **2.8%** |
| | Middle | 264 | -0.001 | 0.961 | No | **-0.1%** |
| **Both Summers** | Elementary | 187 | 0.025 | 0.019 | Yes | **2.6%** |
| | Middle | 404 | 0.016 | 0.001 | Yes | **1.6%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 365 | -0.018 | 0.196 | No | **-1.8%** |
| | Middle | 354 | 0.002 | 0.857 | No | **0.2%** |
| **Summer 2018** | Elementary | 266 | 0.019 | 0.160 | No | **1.9%** |
| | Middle | 263 | 0.021 | 0.062 | No | **2.1%** |
| **Both Summers** | Elementary | 187 | 0.028 | 0.022 | Yes | **2.8%** |
| | Middle | 405 | 0.013 | 0.004 | Yes | **1.3%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 51 | 0.152 | 0.065 | No | **16.5%** |
| | Algebra 1 | 30 | No convergence | | | |
| **Summer 2018** | English 1 | 431 | 0.010 | 0.467 | No | **1.0%** |
| | Algebra 1 | 171 | -0.014 | 0.497 | No | **-1.3%** |
| **Both Summers** | English 1 | 452 | 0.035 | 0.000 | Yes | **3.6%** |
| | Algebra 1 | 192 | 0.040 | 0.001 | Yes | **4.0%** |

### *7. DOSAGE EFFECT ANALYSES FOR HISPANIC STUDENTS (NO LEP BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,885 | **0.011** | 0.333 | No |
| | Middle | 649 | **0.039** | 0.039 | Yes |
| | High | 104 | **0.013** | 0.649 | No |
| **Summer 2018** | Elementary | 1,434 | **0.012** | 0.169 | No |
| | Middle | 579 | **0.032** | 0.198 | No |
| | High | 2,364 | **-0.001** | 0.987 | No |
| **Both Summers** | Elementary | 980 | **0.024** | 0.000 | Yes |
| | Middle | 696 | **0.084** | 0.000 | Yes |
| | High | 2,087 | **0.040** | 0.063 | No |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,979 | 0.046 | 0.252 | No | **4.8%** |
| | Middle | 674 | 0.039 | 0.347 | No | **4.0%** |
| | High | 108 | 0.021 | 0.428 | No | **2.1%** |
| **Summer 2018** | Elementary | 1,441 | -0.006 | 0.713 | No | **-0.6%** |
| | Middle | 587 | 0.019 | 0.232 | No | **1.9%** |
| | High | 2,335 | -0.012 | 0.228 | No | **-1.2%** |
| **Both Summers** | Elementary | 1,309 | 0.005 | 0.694 | No | **0.5%** |
| | Middle | 719 | 0.041 | 0.002 | Yes | **4.2%** |
| | High | 2,084 | 0.003 | 0.554 | No | **0.3%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,402 | 0.005 | 0.669 | No | **0.5%** |
| | Middle | 657 | -0.001 | 0.942 | No | **-0.1%** |
| **Summer 2018** | Elementary | 1,014 | 0.006 | 0.448 | No | **0.6%** |
| | Middle | 573 | 0.022 | 0.012 | Yes | **2.2%** |
| **Both Summers** | Elementary | 539 | 0.045 | 0.003 | Yes | **4.6%** |
| | Middle | 703 | 0.031 | 0.000 | Yes | **3.1%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,402 | 0.012 | 0.484 | No | **1.2%** |
| | Middle | 657 | 0.023 | 0.043 | Yes | **2.3%** |
| **Summer 2018** | Elementary | 1,014 | 0.005 | 0.646 | No | **0.5%** |
| | Middle | 573 | -0.014 | 0.029 | Yes | **-1.4%** |
| **Both Summers** | Elementary | 539 | 0.027 | 0.082 | No | **2.7%** |
| | Middle | 702 | 0.015 | 0.001 | Yes | **1.5%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 42 | 0.027 | 0.459 | No | **2.7%** |
| | Algebra 1 | 32 | 0.023 | 0.591 | No | **2.4%** |
| **Summer 2018** | English 1 | 995 | -0.017 | 0.259 | No | **-1.7%** |
| | Algebra 1 | 397 | -0.046 | 0.034 | Yes | **-4.5%** |
| **Both Summers** | English 1 | 1,399 | 0.033 | 0.000 | Yes | **3.4%** |
| | Algebra 1 | 463 | 0.028 | 0.023 | Yes | **2.8%** |

## *8. DOSAGE EFFECT ANALYSES FOR "OTHER ETHNICIT" STUDENTS (NO LEP BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 53 | **0.027** | 0.399 | No |
| | Middle | 31 | **0.056** | 0.295 | No |
| | High | 15 | **-0.030** | 0.850 | No |
| **Summer 2018** | Elementary | 66 | **0.047** | 0.135 | No |
| | Middle | 39 | **0.033** | 0.614 | No |
| | High | 57 | **-0.005** | 0.977 | No |
| **Both Summers** | Elementary | 31 | **0.018** | 0.438 | No |
| | Middle | 43 | **0.048** | 0.017 | Yes |
| | High | 91 | **0.024** | 0.415 | No |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 56 | 0.128 | 0.575 | No | **13.7%** |
| | Middle | 33 | 0.069 | 0.275 | No | **7.2%** |
| | High | No sample data | | | | |
| **Summer 2018** | Elementary | 65 | 0.000 | 1.000 | No | **0.0%** |
| | Middle | 39 | 0.001 | 0.980 | No | **0.1%** |
| | High | 58 | 0.090 | 0.396 | No | **9.4%** |
| **Both Summers** | Elementary | 38 | No convergence | | | |
| | Middle | 44 | 0.000 | 1.000 | No | **0.0%** |
| | High | 93 | 0.060 | 0.046 | Yes | **6.2%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 35 | No convergence | | | |
| | Middle | 29 | -0.028 | 0.304 | No | **-2.8%** |
| **Summer 2018** | Elementary | 46 | 0.027 | 0.537 | No | **2.7%** |
| | Middle | 37 | -0.261 | 0.073 | No | **-23.0%** |
| **Both Summers** | Elementary | 14 | -0.083 | 0.526 | No | **-7.9%** |
| | Middle | 44 | 0.032 | 0.041 | Yes | **3.3%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 35 | -0.129 | 0.785 | No | **-12.1%** |
| | Middle | 29 | -0.003 | 0.883 | No | **-0.3%** |
| **Summer 2018** | Elementary | 46 | 0.054 | 0.512 | No | **5.6%** |
| | Middle | 37 | 0.055 | 0.240 | No | **5.7%** |
| **Both Summers** | Elementary | 14 | 0.000 | 1.000 | No | **0.0%** |
| | Middle | 44 | 0.008 | 0.323 | No | **0.8%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 6 | No convergence | | | |
| | Algebra 1 | 5 | No convergence | | | |
| **Summer 2018** | English 1 | 26 | 0.011 | 0.876 | No | **1.1%** |
| | Algebra 1 | 6 | 0.030 | 0.808 | No | **3.0%** |
| **Both Summers** | English 1 | 52 | 0.046 | 0.003 | Yes | **4.8%** |
| | Algebra 1 | 22 | 0.054 | 0.045 | Yes | **5.5%** |

### *9. DOSAGE EFFECT ANALYSES FOR WHITE STUDENTS (NO LEP BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 66 | **0.070** | 0.045 | Yes |
| | Middle | 45 | **-0.075** | 0.175 | No |
| | High | 6 | **0.274** | 0.407 | No |
| **Summer 2018** | Elementary | 95 | **0.040** | 0.053 | No |
| | Middle | 18 | **-0.010** | 0.893 | No |
| | High | 60 | **0.183** | 0.634 | No |
| **Both Summers** | Elementary | 48 | **0.027** | 0.022 | Yes |
| | Middle | 31 | **0.046** | 0.082 | No |
| | High | 45 | **0.036** | 0.315 | No |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 74 | 0.054 | 0.436 | No | **5.5%** |
| | Middle | 48 | -0.060 | 0.129 | No | **-5.8%** |
| | High | 6 | 0.000 | 1.000 | No | **0.0%** |
| **Summer 2018** | Elementary | 93 | -0.054 | 0.275 | No | **-5.3%** |
| | Middle | 20 | -0.010 | 0.766 | No | **-0.9%** |
| | High | 57 | 0.030 | 0.803 | No | **3.0%** |
| **Both Summers** | Elementary | 70 | -2.294 | 0.998 | No | **-89.9%** |
| | Middle | No sample data | | | | |
| | High | 46 | 0.009 | 0.545 | No | **0.9%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 42 | -0.144 | 0.197 | No | **-13.4%** |
| | Middle | 41 | -0.107 | 0.088 | No | **-10.1%** |
| **Summer 2018** | Elementary | 52 | 0.032 | 0.541 | No | **3.3%** |
| | Middle | 20 | 0.275 | 0.391 | No | **31.6%** |
| **Both Summers** | Elementary | 21 | No convergence | | | |
| | Middle | 32 | 0.002 | 0.837 | No | **0.2%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 42 | -0.114 | 0.042 | Yes | **-10.8%** |
| | Middle | 41 | -0.119 | 0.041 | Yes | **-11.2%** |
| **Summer 2018** | Elementary | 52 | 0.032 | 0.667 | No | **3.3%** |
| | Middle | 20 | 0.011 | 0.807 | No | **1.1%** |
| **Both Summers** | Elementary | 21 | No convergence | | | |
| | Middle | 32 | 0.003 | 0.757 | No | **0.3%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 2 | No convergence | | | |
| | Algebra 1 | 2 | 0.000 | 1.000 | No | **0.0%** |
| **Summer 2018** | English 1 | 16 | -0.400 | 0.253 | No | **-33.0%** |
| | Algebra 1 | 6 | No convergence | | | |
| **Both Summers** | English 1 | 26 | 0.026 | 0.390 | No | **2.6%** |
| | Algebra 1 | 8 | No convergence | | | |

### *10. DOSAGE EFFECT ANALYSES FOR NON-LEP STUDENTS (NO RACE BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,109 | **0.004** | 0.677 | No |
| | Middle | 659 | **-0.007** | 0.670 | No |
| | High | 196 | **0.008** | 0.701 | No |
| **Summer 2018** | Elementary | 953 | **0.035** | 0.000 | Yes |
| | Middle | 500 | **0.019** | 0.425 | No |
| | High | 1,877 | **-0.033** | 0.331 | No |
| **Both Summers** | Elementary | 652 | **0.025** | 0.000 | Yes |
| | Middle | 671 | **0.061** | 0.000 | Yes |
| | High | 1,288 | **0.049** | 0.003 | Yes |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,216 | 0.000 | 0.969 | No | **0.0%** |
| | Middle | 727 | -0.002 | 0.889 | No | **-0.2%** |
| | High | 214 | -0.006 | 0.694 | No | **-0.6%** |
| **Summer 2018** | Elementary | 954 | -0.003 | 0.788 | No | **-0.3%** |
| | Middle | 510 | -0.004 | 0.729 | No | **-0.4%** |
| | High | 1,843 | -0.005 | 0.546 | No | **-0.5%** |
| **Both Summers** | Elementary | 889 | 0.006 | 0.333 | No | **0.7%** |
| | Middle | 687 | 0.018 | 0.001 | Yes | **1.9%** |
| | High | 1,263 | 0.011 | 0.011 | Yes | **1.1%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 788 | 0.008 | 0.427 | No | **0.8%** |
| | Middle | 668 | 0.003 | 0.702 | No | **0.3%** |
| **Summer 2018** | Elementary | 653 | 0.018 | 0.052 | No | **1.8%** |
| | Middle | 489 | 0.005 | 0.496 | No | **0.5%** |
| **Both Summers** | Elementary | 369 | 0.024 | 0.010 | Yes | **2.4%** |
| | Middle | 675 | 0.018 | 0.000 | Yes | **1.8%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 788 | -0.014 | 0.183 | No | **-1.4%** |
| | Middle | 668 | 0.006 | 0.419 | No | **0.6%** |
| **Summer 2018** | Elementary | 653 | 0.015 | 0.140 | No | **1.5%** |
| | Middle | 488 | 0.003 | 0.630 | No | **0.3%** |
| **Both Summers** | Elementary | 369 | 0.025 | 0.020 | Yes | **2.5%** |
| | Middle | 675 | 0.012 | 0.000 | Yes | **1.2%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 75 | 0.088 | 0.147 | No | **9.2%** |
| | Algebra 1 | 46 | 0.140 | 0.233 | No | **15.0%** |
| **Summer 2018** | English 1 | 632 | -0.008 | 0.533 | No | **-0.8%** |
| | Algebra 1 | 268 | -0.024 | 0.193 | No | **-2.4%** |
| **Both Summers** | English 1 | 778 | 0.035 | 0.000 | Yes | **3.6%** |
| | Algebra 1 | 320 | 0.027 | 0.002 | Yes | **2.7%** |

### *11. DOSAGE EFFECT ANALYSES FOR LEP STUDENTS (NO RACE BREAKDOWN NO DOSAGE LIMIT)*

**BOY GPA:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. |
|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,393 | **0.022** | 0.117 | No |
| | Middle | 410 | **0.024** | 0.346 | No |
| | High | 30 | **0.137** | 0.140 | No |
| **Summer 2018** | Elementary | 1,042 | **-0.001** | 0.944 | No |
| | Middle | 404 | **0.056** | 0.055 | No |
| | High | 1,443 | **-0.028** | 0.615 | No |
| **Both Summers** | Elementary | 727 | **0.023** | 0.029 | Yes |
| | Middle | 502 | **0.115** | 0.000 | Yes |
| | High | 1,624 | **0.041** | 0.111 | No |

**Attendance:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,463 | **0.081** | 0.202 | No | **8.4%** |
| | Middle | 425 | **0.025** | 0.590 | No | **2.6%** |
| | High | 34 | **0.207** | 0.084 | No | **23.0%** |
| **Summer 2018** | Elementary | 1,036 | **0.011** | 0.743 | No | **1.1%** |
| | Middle | 404 | **0.031** | 0.186 | No | **3.1%** |
| | High | 1,416 | **-0.015** | 0.269 | No | **-1.5%** |
| **Both Summers** | Elementary | 958 | **0.010** | 0.642 | No | **1.0%** |
| | Middle | 518 | **0.085** | 0.002 | Yes | **8.8%** |
| | High | 1,637 | **0.008** | 0.230 | No | **0.8%** |

**STAAR Reading:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,056 | 0.020 | 0.283 | No | **2.0%** |
| | Middle | 413 | -0.003 | 0.847 | No | **-0.3%** |
| **Summer 2018** | Elementary | 718 | 0.003 | 0.773 | No | **0.3%** |
| | Middle | 397 | 0.022 | 0.056 | No | **2.2%** |
| **Both Summers** | Elementary | 392 | 0.064 | 0.003 | Yes | **6.6%** |
| | Middle | 508 | 0.035 | 0.000 | Yes | **3.6%** |

**STAAR Math:**

| DCoL Group | Grade | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | Elementary | 1,056 | 0.022 | 0.353 | No | **2.2%** |
| | Middle | 413 | 0.022 | 0.159 | No | **2.2%** |
| **Summer 2018** | Elementary | 718 | -0.001 | 0.965 | No | **-0.1%** |
| | Middle | 397 | -0.012 | 0.201 | No | **-1.2%** |
| **Both Summers** | Elementary | 392 | 0.030 | 0.123 | No | **3.0%** |
| | Middle | 508 | 0.010 | 0.070 | No | **1.0%** |

**STAAR Eng1 & Alg1:**

| DCoL Group | Outcome | Valid N | Dos. Eff. | p | Sig. | Odds Dif. |
|---|---|---|---|---|---|---|
| **Summer 2017** | English 1 | 26 | 0.045 | 0.398 | No | **4.6%** |
| | Algebra 1 | 23 | 0.094 | 0.375 | No | **9.9%** |
| **Summer 2018** | English 1 | 818 | -0.003 | 0.844 | No | **-0.3%** |
| | Algebra 1 | 303 | -0.031 | 0.180 | No | **-3.0%** |
| **Both Summers** | English 1 | 1,151 | 0.034 | 0.000 | Yes | **3.5%** |
| | Algebra 1 | 365 | 0.052 | 0.000 | Yes | **5.3%** |