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EXAMINING THE ROLE OF MENTORSHIP ON YOUTH RESIDING IN URBAN POVERTY: THE EFFECT OF ATTITUDES TOWARD SCHOOL AND SENSE OF INADEQUACY ON ACADEMIC ACHIEVEMENT

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Abstract

Mentoring programs have been shown to improve the academic achievement of participating youth. However, little is known about the constructs impacted during the mentoring relationship that produce these meaningful academic advancements. The present study seeks to uncover what specific mechanisms underlie the relationship between mentoring and improved achievement. The present study explored the constructs Attitudes Towards School and Sense of Inadequacy and examined their relationship to mentoring and academic achievement. These constructs were examined in the context of the Cities Mentor Project, which is a three-pronged intervention (i.e., coping skills training, access to undergraduate mentors and protective settings after school) focused on serving students who have experienced complex/chronic trauma and are living in urban poverty. The present sample includes three-hundred adolescents (ages 7 to 15 years old) who completed a battery of questionnaires, one of which included subscale measures on Attitudes Towards School and Sense of Inadequacy, consented to academic grade collection, and random assignment to the intervention (i.e., Cities Mentor Project) or control group. Results will provide mentoring interventionists with clarity on the underlying mechanisms that enhance academic outcomes for youth residing in low-income and under-served communities.

Keywords: Mentorship, inadequacy, school attitudes, academic achievement, urban youth

Acknowledgments

“Be still and know that I am God…”

Psalm 46:10

I would like to begin my acknowledgements by honoring God. Without His constant grace and mercy, I would not have been able to surmount the obstacles in this Clinical Psychology Ph.D. program. I am forever grateful. I am forever humbled. I am forever Your child.

“If we stand tall it is because we stand on the shoulders of many ancestors.”

African Proverb

I would like to honor my parents, LaVon Denise Jones-Bland and Vincent Keith Stewart. No better parents could I have asked for. It is impossible to enumerate the ways you have helped and supported me throughout this process. It is on your shoulders that I stand. It is your sacrifices that I have benefited from. It is your words that encouraged me. It is your hugs that comforted me. It is your very existence that propels me forward in the face of fear and doubt. I love you with a love so profound that words cannot do it justice. Thank you!

"A mentor is someone who sees more talent and ability within you, than you see in yourself, and helps bring it out of you."

Bob Proctor

I would like to express the utmost gratitude to Dr. Kathryn Grant for her consistent support, encouragement, and wisdom throughout this process. I would also like to recognize the Cities Project lab members for assisting me with this project. Your contributions have not been overlooked.

Biography

The author was born in Evanston, Illinois November 3rd, 1992 but resided on the Southside of Chicago growing up. She graduated from Kenwood Academy High School in 2010 and received her Bachelor of Arts in Psychology and Sociology from the University of Missouri-Columbia in 2013. She is currently pursuing a PhD in Clinical-Child Psychology at DePaul University in Chicago, Illinois.

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INTRODUCTION

The Reality of Poverty, Academic Achievement and Mental Health in Inner Cities

The Chicago Tribune noted: "The number of poor people living in neighborhoods with extreme poverty…grew 384 percent from 2000 to 2015" (Glanton, 2019). As of 2019, 18.4% of Chicagoans resided in poverty, almost twice that of the national average (10.5%), according to the United States Census Bureau (U.S. Census Bureau, 2020; U.S. Census Bureau, 2020). Chicago Public Schools classified 76.4% of its students as "economically disadvantaged" during the 2019-20 school year, with African American and Hispanic students constituting 82.5% of the entire student population (Chicago Public Schools, 2019). Poverty severely affects the quality of education received and the social-emotional resources available to the children and adolescents attending inner city schools (Lacour and Tissington, 2011). Children growing up in poverty complete two fewer years of schooling, will grow up to earn less than half as much, and work 451 fewer hours per year than their affluent counterparts in adulthood (Duncan, Ziol-Guest, Kalil, 2010; Duncan et. al., 2012). These youth are also at increased risk of developing mental health disorders, such as anxiety and depression (Bradley & Corwyn, 2002; Gilman, Kawachi, Fitzmaurice, & Buka, 2002; Wadsworth et al., 2016). In addition to aforementioned obstacles suffered at the hands of poverty, these youth are also at increased risk for various health conditions such as developing heart disease, obesity, and a plethora of other infectious diseases later in life (Gitterman et al., 2016; Haan, Kaplan, & Camacho, 1987; Lee, Andrew, Gebremariam, Lumeng, & Lee, 2014; Tomatis, 1997). Although the effects of poverty are far reaching and insidious, psychologists would be remiss not to explore ways to enhance academic and thus life outcomes of the children they serve.

Examining The Role of Mentorship

Rates of academic engagement, achievement, and school completion in low-income urban communities are lower than anywhere else in our nation (Ceballo, McLoyd, & Toyokawa, 2004; Crowder & South, 2003; Gonzales, Cauce, Friedman, & Mason, 1996). Schools in urban communities consistently perform behind their suburban counterparts, with Black, Hispanic and Native American students attending the worst performing schools, in math and English, nationwide (Logan and Burdick-Will, 2017). This achievement gap, maintained by racial and socio-economic disparities, between inner city and suburban schools often begin early and become more disproportionate as students advance through their schooling (Fryer and Levitt, 2004). Children living in poverty also score significantly lower on tests of cognitive achievement and show larger cognitive deficits than children who are not plagued by poverty, even after controlling for negative household environment and exposure to prenatal risks (Korenman, Miller, Sjaastad, 1995). These compounding difficulties often leave low-income students without high school diplomas, as seen by the increased rates of dropout (Murnane, 2007). Illinois persists in having one of the worst educational fiscal inequalities in the nation, with Chicago being one of the most financially disadvantaged urban districts in the country. Some of the largest fiscal inequities occur on the south and west sides of the city, which are predominately areas of the city where people of color reside (Baker, 2014). This lack of resources and resource distribution in the Chicago Public School (CPS) system directly impacts the learning of the students. According to results on the Partnership for Assessment of Readiness for College and Careers tests, only 22.2% of students meeting or exceeding mathematics standards and only 27.9% of students meeting or exceeding English standards (Chicago Public Schools, 2018).

For children residing in urban poverty, schools also serve as a major resource for social and emotional needs (Rose et al., 2003). Individuals living in poverty are less likely to seek mental health services independently, so schools often become the first line of support for students with mental health needs (Goodman, Smyth, and Banyard, 2010; Anakwenze and Zuberi, 2013). Approximately half of all Americans will meet criteria for a Diagnostic and Statistical Manual of Mental Disorder (DSM) diagnosis with onset in childhood and adolescence (Kessler et al., 2005). Adolescents living in high poverty communities are at increased risk for depressive symptoms, anxiety, suicide and externalizing problem behaviors (Buckner, Beardslee, & Bassuk, 2004; Buka, Stichick, Birdthistle, & Earls, 2001; Fitzpatrick, Piko, Wright, & LaGory, 2005, Fergusson, Woodward, & Horwood, 2000). Especially for low-income children, early adolescence often means increases in stress exposure and the exacerbation of behavioral and social difficulties. During this same developmental period, these youth experience a decrease in adult support and academic engagement and achievement (Benner & Yijie, 2014; Ellerbrock & Kiefer, 2013; Seidman et al., 2003). These findings make it apparent that early intervention and prevention programs are necessary in impoverished communities. Unfortunately, overburdening schools in impoverished communities with increased mental health demands and few resources further causes academic underperformance and the delivery of subpar mental health supports (Atkins et al., 2017).

It has been well-researched that childhood onset of mental health disorders are associated with lower levels of educational attainment, which is a critical indicator of adult well-being (Ou & Reynolds, 2008; Mojtabai et. al., 2015). It is also known that students who graduate high school and pursue college degrees have better physical and

mental health outcomes (Lawrence, 2017; Karoly, 2000; Karoly, Kilburn, Bigelow, Caulkins, & Cannon, 2001). For these reasons, it is important to have a clear understanding of what enhances educational attainment and attitudes in order to design effective interventions for youth living in urban poverty.

Youth Mentoring

Research shows that youth living in low-income communities benefit from a variety of academic, social, and emotional interventions (Farahmand, Duffy, Tailor, DuBois, Lyon, Grant, Czarlinski, Masini, Zander, & Nathanson, 2012). Youth mentoring is one of the most popular interventions used to improve life outcomes for children and adolescents. Youth mentoring is a moderately effective intervention shown to improve youth outcomes in a multitude of areas (DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; DuBois & Rhodes, 2006). Studies have found improved academic adjustment among youth with both natural and assigned mentors (Klaw, Fitzgerald, & Rhodes, 2003). Mentoring has also been shown to discourage skipping school and classes, and improve school grades, engagement, values and attitudes (Keating, et.al. 2002; Tierney & Grossman, 1995**;** Frecknall & Luks, 1992**;** Reidy, Rhodes, & Mulhall, 2003**;** Roeser & Eccles, 1998; Ryan & Grolnick, 1986). Researchers have also found that, through scaffolding, mentors help youth develop new skills, establish obtainable goals, learn novel problem-solving approaches, and provide overall support (Spencer, 2002; Clasen & Clasen, 1997; Flaxman, 1998; Smink, 2000). Preliminary research even shows that having a mentor may close the gap between a youth's dreams and what they perceive as realistic in their lives (Hellenga, Aber, and Rhodes, 2003). Various types of youth

mentoring has also been found to improve students' attitudes towards school, as well as their perceptions of self and their abilities.

It is important to understand how the literature defines and conceptualizes youth mentoring. Youth mentoring is defined as a “relationship between an older, more experienced adult and an unrelated, younger protégé –this is a relationship in which the adult provides ongoing guidance, instruction, and encouragement aimed at developing the competence and character of the protégé” (Rhodes, 2002). Although mentoring interventions are well established, mentoring processes, meaning “how” mentoring works, is an area that needs more attention in the research community. If interventionists can establish an understanding of the specific constructs that lead to the improved outcomes in youth, we can better craft programs and curricula and train mentors and service providers.

Jean Rhodes proposes a model that attempts to capture the complexities of the mentoring relationship and its associated outcomes. This model has not been fully tested, but the empirical studies discussed above provide evidence to support Jean Rhodes conceptualization of the mentoring process. The conceptual model of mentoring, put forth by Jean Rhodes, states that mentoring leads to positive youth development through three developmental processes: (1) social-emotional development, (2) cognitive development and (3) role modeling and identification (Rhodes, 2002). Rhodes’ model states that mentors contribute to mentees’ social-emotional development by providing a healthy distraction from daily life stressors, corrective emotional experiences, and emotion regulation skills. Rhodes’ model also argues that mentors impact a youth’s cognitive development by exposing them to novel learning opportunities, encouraging intellectual rigor, providing academic guidance and encouragement, and promoting academic success.

Lastly, this conceptual model asserts that mentors serve as role models for youth, individuals that represent tangible and achievable examples of success. Rhodes also acknowledges that there are various contextual influences (i.e., program practices, interpersonal history, and family instability) that impact the mentoring outcomes.

In order to truly understand and be able to manipulate the power of mentoring interventions, we must understand why the intervention is impactful in the first place. Mentoring shows moderate, yet meaningful effects sizes, but with a deeper understanding we may be able to enhance its impact. Rhodes' mentoring model hypothesized three developmental categories through which all possible outcomes associated with mentoring occur. More specific mechanisms that fit into these categories most closely tied to academic outcomes may be Attitudes Towards School and Sense of Inadequacy. Studies have not examined these mechanisms as mediators of mentoring effects on academic achievement. The present study addresses the gaps in the literature by testing these three specific variables that may serve as proxies for these processes.

Attitudes Towards School

The first mechanism this study will explore are youth's attitudes toward school. Youth's Attitudes Towards School have been often researched, in hopes of finding a link to high academic achievement. The construct is often viewed as having two components: emotional and cognitive. The emotional component consists of an individual's interest and affect towards school (McCoach & Siegle, 2003). The cognitive component consists of a person's belief and perceptions about the importance of school (Oppenheim, 1992). Many studies conclude that there is a positive relationship between a youth's attitude towards school and his/her academic achievement (e.g., Chang & Le, 2005; Cheng & Chan, 2003;

Dolan,1983; Majoribanks, 1992; McCoach & Siegle, 2003; Suldo et al., 2008). In the Suldo et al. study, researchers found a positive correlation between attitudes and achievement amongst low, average, and high achieving students. Chang and Le (2005) found that attitudes about school significantly predicted a student's level of academic achievement. This further highlights the importance of school-related aspirations and expectations and their ability to determine actual grades. Negative attitudes toward school, teachers, and school achievement, are often associated with academic failure (Freedman, 1993). Findings from previous studies have also demonstrated that Black and African American students with high levels of educational aspirations and commitment to school fare better academically than students with low aspirations and levels of commitment to school (Awad, 2007; Ford & Harris, 1996). The current literature has not explored the impact of mentoring on urban youths' attitudes toward school. Although no previous research has been conducted, Jean Rhodes conceptual framework suggests that mentorship may create positive dialogue around school, its importance, and utility in life. This study seeks to test the relationship between Attitudes Toward School and academic achievement. This study will also explore whether this construct accounts for mentoring effects on youth's academic outcome.

Sense of Inadequacy

The second mechanism this study will explore is youth's Sense of Inadequacy. According to the Behavior Assessment System for Children, Third Edition manual, this concept of Sense of Inadequacy is related to a student's confidence, persistence, and goal aspirations and attainment. Several studies have shown that African American and Latinx youth attending non-racially diverse schools are likely to encounter teachers who have

lower expectations for them and feel less responsible for the learning of their students (Balfanz, 2000; Diamond, Randolph, & Spillane, 2004; Wiggan, 2007). It makes sense that this impacts how students perceive their own achievement and how adequate they are in academic environments. This study seeks to explore the relationship between mentoring and youth's Sense of Inadequacy or lack thereof and how it relates to a youth's academic achievement.

Rationale

Previous research has established a relationship between mentorship and improved outcomes for youth. What is less understood is "how" mentorship contributes to these positive outcomes for youth. This study seeks to evaluate the trauma-focused mentoring intervention, specifically exploring "how" the mentoring relationship may affect change in urban youth of color. If we are able to uncover what constructs create positive change, we can better develop interventions, train mentors, and share these findings with families, schools, and communities. A few constructs that have been shown to have strong empirical linkages to youths' academic achievement are a youth's attitudes towards school and their feelings of inadequacy in academic settings. Both constructs also conceptually fit into the social-emotional domain outlined in Jean Rhodes conceptual model of mentoring. What has yet to be explored is the impact mentoring has on these two constructs, especially in the context of urban youth. This study aims to provide interventionists with a more detailed roadmap when creating programs, so that the mentoring community can maximize its effect and impact on the academic achievement of urban students of color. If we can determine the mechanism(s) that influence positive academic outcomes for youth, we can focus on enhancing those salient constructs in intervention development and

training. The present study seeks to answer the following questions: 1) Are Attitudes Towards School and Sense of Inadequacy associated with group designation (i.e., control v. intervention)? 2) Do students in the intervention group have more positive attitudes towards school and less feelings of inadequacy at the end of the school year and at follow-up than control group youth? Do negative attitudes towards school and high levels of self-reported feelings of inadequacy decrease in intervention group youth over time? 3) Does Attitudes Towards Schools and Sense of Inadequacy predict English, Science, and Mathematics grades in youth? 4) Do Attitudes Toward School and Sense of Inadequacy respectively, mediate the relationship between the intervention dosage (i.e., time spent with mentors) and academic achievement (i.e., Science, English, Mathematics, and Non-Core Subjects)?

Statement of Hypotheses

The current study will focus on the following constructs: Attitudes Toward School and Sense of Inadequacy. In order to further explore these constructs in the context of urban mentoring, we must first determine whether there are any correlations between them, group designation (i.e., control group v. intervention group) and intervention dosage (i.e., time spent with mentors). It will also be important to examine the relationship between Attitudes Toward School and Sense of Inadequacy and grades. This study will then evaluate if the control and intervention group had statistically significant differences in means on Attitudes Towards School and Sense of Inadequacy from baseline to follow up. We will also examine whether there is growth in these mechanisms over the course of the mentoring relationship for students in the intervention group. Next, it will be important to examine whether having more positive attitudes towards school and lower feelings of

inadequacy predicts better grades. After exploring those preliminary relationships, this study will examine whether Attitudes Toward School and Sense of Inadequacy mediate the relationship between intervention dosage (i.e., time spent with a mentor), mentoring and academic achievement.

I. Attitudes Toward School

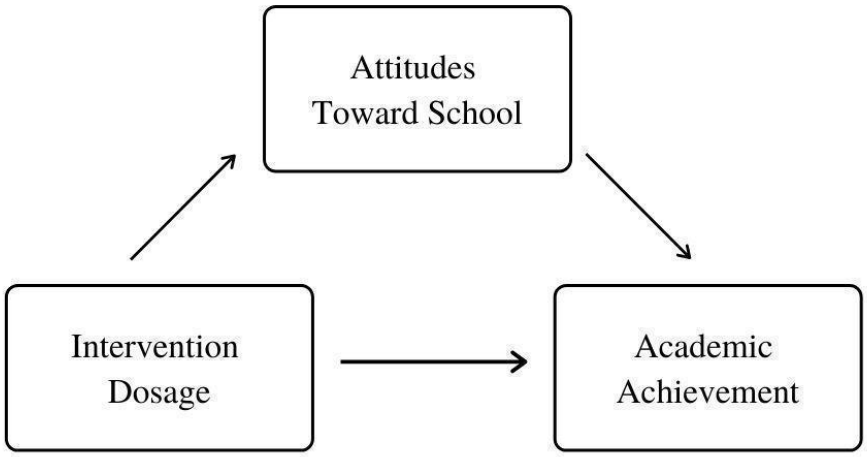
Hypothesis A. Attitudes Toward School will be significantly correlated with group designation (control v. intervention) and English, science, and mathematics grades.

Hypothesis B. Youth in the intervention group will have a more positive attitude towards school than control group youth at Time 3 and Time 4. Negative attitudes towards school will also decrease in intervention group youth over time.

Hypothesis C. Attitudes Toward School will predict English, science, and mathematics grades in youth.

Hypothesis D. Youth who receive more of the intervention will see increases in academic achievement, which will be mediated through the mechanism of Attitude Toward School. Attitude Toward School at Time 2 will mediate the relationship between intervention dosage at Time 2 and Academic Achievement at Time 3.

Model I.D: Intervention dosage is associated with increased academic achievement mediated through mentees attitudes toward school.



II. Sense of Inadequacy

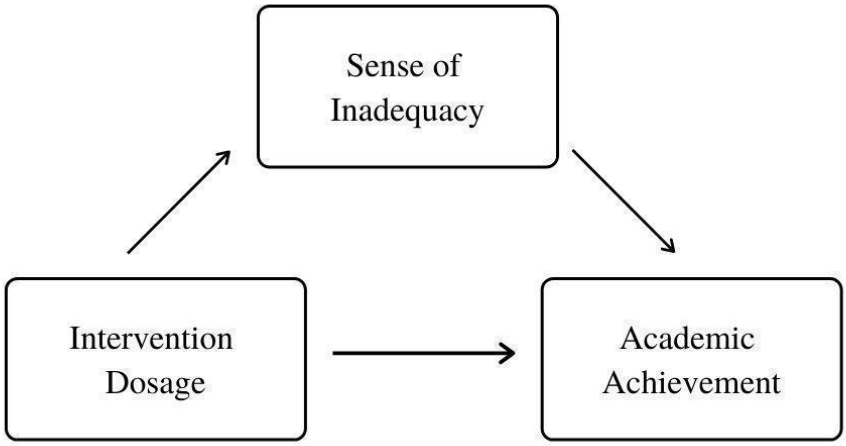
Hypothesis A. Sense of Inadequacy will be significantly correlated with group designation (control v. intervention) and English, science, and mathematics grades.

Hypothesis B. Youth in the intervention group will report lower levels of self-reported inadequacy than control group youth at Time 3 and Time 4. High levels of self-reported feelings of inadequacy will decrease in intervention group youth over time.

Hypothesis C. Sense of Inadequacy will predict English, science, and mathematics grades in youth.

Hypothesis D. Youth who receive more of the intervention will see increases in academic achievement, which will be mediated through the mechanism of Sense of Inadequacy. Sense of Inadequacy at Time 2 will mediate the relationship between intervention dosage at Time 2 and Academic Achievement at Time 3.

Model II.D: Intervention dosage is associated with increased academic achievement mediated through mentees Sense of Inadequacy



METHODS

Data

The data for the present study were collected as a part of a larger, ongoing, longitudinal study. The larger study aims to develop and refine an intervention that mitigates the effect of trauma and poverty by utilizing a three-pronged approach: 1) coping training, 2) access to mentors, 3) and linkage with community organizations (i.e. protective settings), to further develop skills essential for positive youth development. The DePaul University's and the Chicago Public Schools' Institutional Review Boards have approved the larger longitudinal study.

The Cities Mentor Project

The Cities Mentor Project intervention was created in response to a study focused on identifying protective factors in low-income communities. Findings from the study guided researchers in the creation of a comprehensive mentoring intervention that aims to

bolster academic and mental health outcomes for youth living in low-income communities. This project has been implemented in Englewood, a community in Chicago, Illinois, where the median household income is $27, 361, the unemployment rate is 36.8%, and 40.5% of households fall below the federal poverty line (Lee, 2016). This project provides approximately 30-50 elementary school students per school year with college undergraduate mentors, coping skills training, and access to protective settings. This project hopes to mitigate the impact of growing up in urban poverty and amongst daily traumatic experiences.

Intervention Components

The Cities Mentor Project is an intervention that provides a three-pronged approach to the disparities experienced by youth in urban environments. Youth enrolled in the intervention received an undergraduate college mentor, weekly coping skills training, and access to protective settings during the school week. Mentors are DePaul undergraduates who were recruited via mass emails, classroom visits, and student organization fairs. Interested undergraduates then meet with the Cities Founder or Program Director to learn more about the experience and to be assigned to one of the three partner schools. Mentors are background checked through Chicago Public School's mandated volunteer process. Mentors participate in one training at the beginning of each of DePaul University's three quarters led by the Cities Program Director.

The weekly coping skills training occurs on Wednesday's afterschool on school grounds. Mentors and graduate level clinicians meet mentees at their respective schools and spend approximately an hour to an hour and a half together. The coping skills curriculum is an adapted version of Structured Psychotherapy for Adolescents Responding

to Chronic Stress (SPARCS). SPARCS is an evidence-based group therapy treatment for kids experiencing chronic stress/trauma. This therapeutic treatment incorporates Dialectical Behavioral Therapy (DBT) principles such as mindfulness and grounding techniques, problem solving skills, interpersonal skills. The Cities Project Program Director(s) have worked to also implement other meaningful skills, such as grit and growth mindset, goal setting, and advocacy, into the curriculum. Sessions are structured and incorporate whole group, mentee/mentor pair, and small group activities. Graduate level clinicians are present to facilitate the group and ensure all pairs are adequately supported in their time together. Outside of the weekly coping sessions, mentors were encouraged to continue in-person contact and virtual communication (i.e., telephone, social media, etc.) throughout the week.

Protective settings activities occur on Mondays, Tuesdays, Thursdays, and Fridays. Graduate level clinicians and mentors engage with youth afterschool on these days by taking them to afterschool programs in their community (i.e., YouMedia, The Ark of St. Sabina, Boys and Girls Club) or creating their own activities (i.e., playing games, arts and crafts). These protective settings provide students with a safe environment after school with supportive adults, who help them practice the skills they have been learning in natural settings.

Cities Project in the Current Study

The Cities Mentor Project partnered with three elementary schools in the Englewood community to pilot the program. Youth were randomly assigned to the control group, meaning they did not receive any of the three intervention components (i.e., undergraduate mentor, coping training, protective settings), or the intervention group,

where they were provided a mentor, participated in coping trainings, and were linked with protective settings. Mentors and mentees both attended weekly coping trainings at the partner schools and continued in-person contact and virtual communication (e.g., telephone, social media, etc.) throughout the month. The present study seeks to understand how programs, such as the Cities Mentor Project, servicing impoverished inner city youth may create positive academic change.

Participants

Three-hundred adolescents (ages 7 to 15 years old; average age is 11.5 years old) were recruited from three diverse urban elementary schools in Chicago's southside neighborhood, Englewood/Auburn Gresham. The student body of the three participating elementary schools are on average 95% Black/African American, 94% low-income, 15.3% diverse learners (i.e., special education), and chronic truancy rates range from 23.6% to 46.6% (CPS, 2022). In the current sample, there were one hundred and seventy-two participants (57.3%) in the intervention group, seventy-eight (26%) control group youth and fifty (16.7%) youth excluded due to a missing group designation or being moved between groups (e.g., control to intervention). In the current sample, one hundred and twenty-five (41.7%) participants identified as male, one hundred and seventy-three (57.7%) as female, and 2 (.7%) participants' genders are unidentified. The sample was one hundred and ninety-two (64.0%) African American, thirteen (4.3%) Bi-racial, one (.3%) American Indian or Alaskan Native, two (.7%) Other, ninety-two (30.7%) unidentified. Participants were part of five separate cohorts: Cohort 4 (25.3% of sample; 76 participants), Cohort 5 (25.3% of the sample; 76 participants), Cohort 6 (19.7% of the

sample; 59 participants), Cohort 7 (11.7% of the sample; 35 participants), Cohort 8 (18.0% of the sample; 54 participants) as a part of the larger intervention study.

Five distinct cohorts, or waves, of students participated in the Cities Mentor Project and data collected for this study occurred over the course of a year and a half. Youth completed an online survey via SurveyMonkey or RedCap, which comprised a battery of measures, including the BASC-3. Participants completed their baseline measure in June before their first school year enrolled in the program. The second time point was collected in December, the third time point was collected in June, and the fourth time point was collected six months after the school year in December. Due to rolling admissions during this period, youth completed baselines (and follow-ups) off this prescribed schedule.

Materials

Intervention Dosage: Intervention dosage was measured by the amount of time the mentor and protégé spend talking by phone or physically with one another. Monthly time logs were collected from mentors that indicated the amount of time the mentor and protégé spent communicating. These time logs were used to measure how much of the intervention each child received.

Attitude Towards School: The Attitudes Toward School subscale is a part of the Behavior Assessment System for Children-Self-Report of Personality (BASC-SRP). This subscale contains seven items, which assess feelings of alienation, hostility and dissatisfaction with school. Sample items include “I feel like I want to quit school” and “I don’t like thinking about school.” Children rate their responses on a 4-point scale, in which responses are Never, Sometimes, Often, or Always.

Sense of Inadequacy: The Sense of Inadequacy subscale is a part of the Behavior Assessment System for Children-Self-Report of Personality (BASC-SRP). This subscale assesses the child's perceptions of being unsuccessful in school, unable to achieve one's goals and generally inadequate. Sample items include "Doing my best is never good enough" and "I'd rather quit than fail". Children rate their responses on a 4-point scale, in which responses are Never, Sometimes, Often, or Always.

Academic Achievement: CPS Report Cards were collected for youth participants. Final grades, as reported on end of year CPS report cards, from core classes such as Mathematics, English and Science were used for analyses. All other classes (i.e., art, music, library science) were combined into one variable labeled Non-Core Subjects.

Procedure

Participants completed a battery of questionnaires assessing Attitudes Toward School, and Sense of Academic Adequacy at each time point. All questionnaires were disseminated and completed using an online survey system and took approximately an hour to complete. Academic records were collected from the Chicago Public School Board of Education. Mentors submitted time logs also on a quarterly basis to track time spent interacting with their protégé. The time points used for the present study are as follows: Time 1: June 2015-2019, Time 2: December 2015-2019, Time 3: June 2016-2020, Time 4: December 2016-2020.

Table 1.1. *Dates Associated with Time Points for each Cohort*

Time Points/Cohort	Date
Time 1	
Cohort 4	06/16/2015
Cohort 5	06/21/2016
Cohort 6	06/20/2017

	Cohort 7	06/19/2018
	Cohort 8	06/18/2019
Time 2		
	Cohort 4	12/12/2015
	Cohort 5	12/10/2016
	Cohort 6	12/16/2017
	Cohort 7	12/15/2018
	Cohort 8	12/14/2019
Time 3		
	Cohort 4	06/21/2016
	Cohort 5	06/20/2017
	Cohort 6	06/19/2018
	Cohort 7	06/18/2019
	Cohort 8	06/16/2020
Time 4		
	Cohort 4	12/10/2016
	Cohort 5	12/16/2017
	Cohort 6	12/15/2018
	Cohort 7	12/14/2019
	Cohort 8	12/12/2020

Data Analyses

Hypothesis A: Attitudes Toward School and Sense of Inadequacy will be significantly correlated with group designation (control v. intervention) and English, science, and mathematics grades. In the present study, point biserial correlations will be conducted to explore the relationship between attitudes toward school, Sense of Inadequacy, group designation (control v. intervention) and English, science, and mathematics grades.

Hypothesis B: Youth in the intervention group will report lower levels of self-reported inadequacy and more positive attitudes towards school than control group youth at Time 3

and Time 4. High levels of self-reported feelings of inadequacy and negative attitudes towards school will decrease in intervention group youth over time. Independent samples t-tests will be used to explore the differences in Attitudes Toward School and Sense of Inadequacy between the control and intervention groups at each time point. Paired samples t-test will evaluate the decrease in self-reported feelings of inadequacy and negative attitudes towards school over time.

Hypothesis C: Attitudes Toward School and Sense of Inadequacy will predict English, science, and mathematics grades in youth. Simple linear regressions will examine whether Attitudes Toward School and Sense of Inadequacy scales predict academic grades.

Hypothesis D: Attitudes Toward School will mediate the relationship between the intervention dosage and academic achievement. In the present study, simple mediation effects will be tested using the SPSS PROCESS macro created by Hayes and Matthes (2013). This statistically robust style of mediation analysis uses the indirect effect path coefficient as an indicator of significant mediation and does not require all path coefficients within the mediation model to be significant (Preacher & Hayes, 2008). This PROCESS macro estimates path coefficients and creates bootstrapping confidence intervals, often 95%, to calculate the indirect effects of X on Y through a mediator. This analysis is ensuring that the mediator is accounting for enough variance within a 95% confidence interval.

RESULTS

Means and standard deviations using raw scores of Attitudes Towards School and Sense of Inadequacy are presented in Table 1.1 and 1.2. It is important to note that the

sample size of the control group is markedly lower than that of the intervention group, especially at later time points.

Table 1.1. *Descriptive Statistics for Attitudes Towards School (ATS) and Sense of Inadequacy (SIN) for the Control Group*

Variables	Sample Size	Mean	Std. Deviation
Attitudes Towards School (T1)	34	6.411	4.425
Attitudes Towards School (T2)	17	6.058	2.703
Attitudes Towards School (T3)	6	6.333	5.240
Attitudes Towards School (T4)	9	5.111	6.450
Sense of Inadequacy (T1)	34	7.000	5.432
Sense of Inadequacy (T2)	17	8.411	5.220
Sense of Inadequacy (T3)	7	6.428	5.287
Sense of Inadequacy (T4)	8	3.875	3.758

Table 1.2. *Descriptive Statistics for Attitudes Towards School (ATS) and Sense of Inadequacy (SIN) for the Intervention Group*

Variables	Sample Size	Mean	Std. Deviation
Attitudes Towards School (T1)	85	6.070	4.832
Attitudes Towards School (T2)	67	6.985	4.850
Attitudes Towards School (T3)	46	6.543	4.759
Attitudes Towards School (T4)	45	6.888	4.909
Sense of Inadequacy (T1)	84	6.142	5.373
Sense of Inadequacy (T2)	66	6.227	5.827
Sense of Inadequacy (T3)	45	7.400	5.650
Sense of Inadequacy (T4)	45	6.555	4.224

Means and standard deviations for core academic grades are presented in Table 1.3 and 1.4. Grades were provided by the Chicago Public Schools Student Records Department for participants.

Table 1.3. *Descriptive Statistics for Academic Grades for the Control Group*

Variables	Sample Size	Mean	Std. Deviation
Mathematics (T3)	50	2.406	.896
Science (T3)	52	2.746	.922
English (T3)	48	2.531	.980
Non-Core Subjects (T3)	52	2.989	.851

*Note. Scale for grades: 4=A, 3=B, 2=C, 1=D, 0=F

Table 1.4. *Descriptive Statistics for Academic Grades for the Intervention Group*

Variables	Sample Size	Mean	Std. Deviation
Mathematics (T3)	121	2.562	.967
Science (T3)	123	2.890	.917
English (T3)	122	2.627	.861
Non-Core Subjects (T3)	123	2.946	.822

*Note. Scale for grades: 4=A, 3=B, 2=C, 1=D, 0=F

No significant differences between grades (Time 3) were found between intervention and control group youth (see Table 1.5).

Table 1.5. *Independent Samples T-Test*

Variables		N	Levene's F/*p*	*t*	df	*p*
Mathematics (T3)			.508/*.477*	-.976	169	.331
	Control	50				
	Intervention	121				
Science (T3)			.001/*.975*	-.944	173	.346
	Control	52				
	Intervention	123				
English (T3)			2.769/*.098*	-.627	168	.531
	Control	48				
	Intervention	122				
Non-Core Subjects (T3)			.000/*.994*	.319	173	.750
	Control	52				
	Intervention	123				

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.

Means and standard deviations for intervention dosage are presented in Table 1.6. Means for intervention dosage illustrate that intervention group youth received on average 22.43 hours of mentoring during their first year enrolled in the intervention.

Table 1.6. *Descriptive Statistics for Intervention Dosage Control and Intervention Group*

Variables	Sample Size	Mean	Std. Deviation
Control (T3)	72	.000	.000
Intervention (T3)	58	1346.99	1071.49

Note: Dosage data was collected in minutes.

Attrition and Missingness

Although there are three hundred potential participants in the current sample, missingness and/or attrition affected the sample size available for the presented analyses. In Table 1.7 you will find missing cases for every study variable in the current study.

Table 1.7. *Missingness in All Study Variables*

Variables		N	Missing Cases
Group Designation		250	50
	Control	78	-
	Intervention	172	-
Intervention Dosage (T3)		134	166
Gender		298	2
	Male	125	-
	Female	173	-
Age		253	47
Science (T3)		195	105
Non-Core Subjects (T3)		195	105
English (T3)		190	110
Mathematics (T3)		191	109
Science (T3) (Med)		37	263
Non-Core Subjects (T3) (Med)		37	263
English (T3) (Med)		37	263
Mathematics (T3) (Med)		37	263

Attitudes Towards School (T1)	148	152
Attitudes Towards School (T2)	91	209
Attitudes Towards School (T3)	52	248
Attitudes Towards School (T4)	58	242
Sense of Inadequacy (T1)	147	153
Sense of Inadequacy (T2)	90	210
Sense of Inadequacy (T3)	52	248
Sense of Inadequacy (T4)	57	243
Attitudes Towards School (Mean of T1-T3) (Med)	148	152
Sense of Inadequacy (Mean of T1-T3) (Med)	147	153

Med = Variable used for the proposed mediation models.
Mean of T1-T3 = Represents the statistical average of time points 1 through 3.

Due to the attrition in the current study, mean aggregates from all time points for Attitudes Towards School and Sense of Inadequacy scales were created and used in cross sectional mediation analyses. In Table 1.8, cases lost between time points are presented.

Table 1.8. *Attrition for Attitudes Towards School and Sense of Inadequacy*

Variables	N	Lost Cases from T1
Attitudes Towards School (T1)	148	-
Control	34	-
Intervention	85	-
Attitudes Towards School (T2)	91	-
Control	17	17 cases lost
Intervention	67	18 cases lost
Attitudes Towards School (T3)	52	-
Control	6	28 cases lost
Intervention	46	39 cases lost
Attitudes Towards School (T4)	58	-
Control	9	25 cases lost
Intervention	45	40 cases lost
Sense of Inadequacy (T1)	147	-
Control	34	-

	Intervention	84	-
Sense of Inadequacy (T2)		90	-
	Control	17	17 cases lost
	Intervention	66	18 cases lost
Sense of Inadequacy (T3)		52	-
	Control	7	27 cases lost
	Intervention	45	39 cases lost
Sense of Inadequacy (T4)		57	-
	Control	8	26 cases lost
	Intervention	45	39 cases lost

In Table 1.9, the sample size, means, and standard deviations for Attitudes Towards Schools and Sense of Inadequacy for all participants, regardless of group designation is presented.

Table 1.9. *Sample Size, Means, and Standard Deviations for Attitudes Towards School and Sense of Inadequacy for Entire Sample*

Variables	Sample Size	Mean	Std. Deviation
Attitudes Towards School (T1)	148	5.851	4.489
Attitudes Towards School (T2)	91	6.758	4.505
Attitudes Towards School (T3)	52	6.519	4.762
Attitudes Towards School (T4)	58	6.465	5.065
Sense of Inadequacy (T1)	147	6.115	5.294
Sense of Inadequacy (T2)	90	6.777	5.739
Sense of Inadequacy (T3)	52	7.269	5.562
Sense of Inadequacy (T4)	57	6.000	4.276

Covariates

Age and gender were correlated with main study variables, and results are shown in Tables 1.10 and 1.11. Significant correlations were found between age and Science grades at time point three (T3), $r = .196$, $p = .011$, age and Non-Core Subjects grades at time point three (T3), $r = .163$, $p = .036$, and age and Sense of Inadequacy at time point

one (T1), $r = .234$, $p = .008$. These results suggest that the older the child, the higher their Science and Non-Core Subjects grades. It also suggests that the older the child the higher their feelings of inadequacy. Significant correlations between age and group designation, $r = -.201$, $p = .003$, and age and intervention dosage, $r = -.274$, $p = .003$, were also found. These results suggest that older children were more likely to be in the control group, which means that older children were also more likely to receive less intervention dosage (i.e. control group youth received 0 minutes of the intervention).

Table 1.10. *Correlations between Age, Academic Grades, Sense of Inadequacy (T1), Group Designation, and Intervention Dosage*

Variables	1	2	3	4	5	6
1. Age	-					
2. Science (T3)	.196*	-				
Sample Size	166					
3. Non-Core Subjects (T3)	.163*	-	-			
Sample Size	166					
4. Sense of Inadequacy (T1)	.234**					
Sample Size	129					
5. Group Designation	-.201**					
Sample Size	215					
6. Intervention Dosage	-.274**					
Sample Size	119					

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Significant correlations between gender and Science grades at time point three (T3), $r = .188$, $p = .009$, gender and Non-Core Subjects grades at time point three (T3), $r = .265$, $p = .000$, and gender and English grades at time point three (T3), $r = .223$, $p = .002$ were also found. These results suggest that females in this sample had a higher Science,

English, and Non-Core Subjects grades than males. A full matrix including all study variables can be found in Appendix C.

Table 1.11. *Correlations between Gender, Academic Grades, Group Designation, and Intervention Dosage*

Variables	1	2	3	4	5	6
1. Gender	-					
2. Science (T3)	.188**	-				
Sample Size	194					
3. English (T3)	.223**	-	-			
Sample Size	189					
6. Non-Core Subjects (T3)	.265**					
Sample Size	194	-	-	-		

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Hypothesis Testing

Hypothesis A.

Correlations between Attitudes Towards School and group designation and intervention dosage are depicted in Tables 2.1 and 2.2. Partial correlations were conducted controlling for age, due to the significant associations between age, group designation, r = -.201, p = .003, and intervention dosage, r = -.274, p = .003.

Table 2.1. *Attitudes Towards School and Group Designation Controlling for Age: Partial Correlations*

Variables	1	2	3	4	5
1. Group Designation	-				
2. Attitudes Towards School (T1)	.000	-			
Degrees of Freedom	116				
3. Attitudes Towards School (T2)	.073	.293**	-		
Degrees of Freedom	81	34			

4. Attitudes Towards School (T3)	.058	.343**	.561**	-	
Degrees of Freedom	47	47	46		
5. Attitudes Towards School (T4)	.149	.205	.410**	.443**	-
Degrees of Freedom	51	55	47	37	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
Analyses were also conducted excluding the control variables. Results can be found in Appendix D. Results were consistent with the ones presented above.

No significant correlations between group designation and Attitudes Towards School were found, when controlling for age.

Table 2.2. *Attitudes Towards School and Dosage Controlling for Age: Partial Correlations*

Variables	1	2	3	4	5
1. Intervention Dosage	-				
2. Attitudes Towards School (T1)	-.177	-			
Degrees of Freedom	93				
3. Attitudes Towards School (T2)	-.025	.293**	-		
Degrees of Freedom	62	86			
4. Attitudes Towards School (T3)	.109	.343**	.561**	-	
Degrees of Freedom	28	47	46		
5. Attitudes Towards School (T4)	-.120	.205	.410**	.443**	-
Degrees of Freedom	33	55	47	37	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed)

No significant correlations between group designation and Attitudes Towards School (T1) were found when controlling for age. Correlations between Sense of Inadequacy and group designation and intervention dosage are depicted in Tables 2.3 and 2.4.

Table 2.3. *Sense of Inadequacy and Group Designation Controlling for Age: Partial Correlations*

Variables	1	2	3	4	5
1. Group Designation	-				
2. Sense of Inadequacy (T1)	-.027	-			
Degrees of Freedom	115				
3. Sense of Inadequacy (T2)	-.130	.303**	-		
Degrees of Freedom	80	85			
4. Sense of Inadequacy (T3)	.048	.396**	.556**	-	
Degrees of Freedom	47	47	46		
5. Sense of Inadequacy (T4)	.239	.437**	.482**	.497**	-
Degrees of Freedom	50	54	44	35	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
Analyses were also conducted excluding the control variables. Results can be found in Appendix D. Results were consistent with the ones presented above.

No significant correlations between group designation and Sense of Inadequacy were found, when controlling for age.

Table 2.4. *Sense of Inadequacy and Dosage Controlling for Age: Partial Correlations*

Variables	1	2	3	4	5
1. Intervention Dosage	-				
2. Sense of Inadequacy (T1)	-.160	-			
Degrees of Freedom	93				
3. Sense of Inadequacy (T2)	-.038	.303**	-		
Degrees of Freedom	62	85			
4. Sense of Inadequacy (T3)	.016	.396**	.556**	-	
Degrees of Freedom	28	47	46		
5. Sense of Inadequacy (T4)	-.024	.437**	.482**	.497**	-
Degrees of Freedom	33	54	44	35	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).I

No significant correlations between intervention dosage and Sense of Inadequacy (T1) were found when controlling for age.

Correlations among Attitudes Towards School and Sense of Inadequacy and core academic grades are depicted in Tables 2.5 and 2.6. Partial correlations were also conducted as age and gender were correlated with several core academic grades and Sense of Inadequacy Time 1 (T1).

Table 2.5. *Attitudes Towards School and Academic Grades Controlling for Gender and Age: Partial Correlations*

Variables	1	2	3	4	5	6	7	8
1. Mathematics (T3)	-							
2. Science (T3)	.633**	-						
Degrees of Freedom	158							
3. English (T3)	.724**	.663**	-					
Degrees of Freedom	157	157						
4. Non-Core Subjects (T3)	.578**	.700**	.638**	-				
Degrees of Freedom	158	162	157					
5. Attitudes Towards School (T1)	-.161	-.134	-.128	-.159	-			
Degrees of Freedom	81	81	81	81				
6. Attitudes Towards School (T2)	-.197	-.108	-.119	-.263*	.300**	-		
Degrees of Freedom	51	51	51	51	85			
7. Attitudes Towards School (T3)	.133	-.106	-.176	-.005	.330**	.577**	-	
Degrees of Freedom	31	31	31	31	46	45		
8. Attitudes Towards School (T4)	.023	-.205	.119	-.082	.207	.409**	.451**	-
Degrees of Freedom	38	38	38	38	54	46	36	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Attitudes Towards School at Time 2 (T2) is significantly correlated with Non-Core subjects grades, $r = -.263$, $p = .057$, when controlling for age and gender. These results indicate that the more negative students' attitudes towards school the poorer they performed in Non-Core Subjects.

Table 2.6. *Sense of Inadequacy and Academic Grades Controlling for Gender and Age: Partial Correlations*

Variables	1	2	3	4	5	6	7	8
1. Mathematics (T3)	-							
2. Science (T3)	.633**	-						
Degrees of Freedom	158							
3. English (T3)	.724**	.663**	-					
Degrees of Freedom	157	157						
4. Non-Core Subjects (T3)	.578**	.700**	.638**	-				
Degrees of Freedom	158	162	157					
5. Sense of Inadequacy (T1)	-.280**	-.126	-.258**	-.221*	-			
Degrees of Freedom	81	81	81	81				
6. Sense of Inadequacy (T2)	-.263*	-.114	-.112	-.312*	.279**	-		
Degrees of Freedom	51	51	51	51	84			
7. Sense of Inadequacy (T3)	-.177	-.306	-.375*	-.223	.393**	.582**	-	
Degrees of Freedom	31	31	31	31	46	45		
8. Sense of Inadequacy (T4)	-.109	-.171	.039	-.067	.435**	.491**	.494**	-
Degrees of Freedom	37	37	37	37	53	43	34	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Sense of Inadequacy at Time 1 (T1) was correlated with Mathematics [r = -.280, p = .010], English [r = -.258, p = .019] and Non-Core Subjects [r = -.221, p = .044] grades at the end of the school year, when controlling for gender and age. Students reporting lower levels of inadequacy at baseline received higher grades in Mathematics, English and Non-Core Subjects. Sense of Inadequacy at Time 2 (T2) was correlated with Mathematics [r = -.263, p = .057] and Non-Core Subjects [r = -.312, p = .023], when controlling for gender and age. Students reporting lower levels of inadequacy in the middle and at the end of the school year received higher grades in Mathematics and Non-Core Subjects. Sense of

Inadequacy at Time 3 (T3) was also correlated with English [r = -.375, p = .032], when controlling for age and gender.

Hypothesis B.

In order to test the efficacy of the intervention, an independent samples t-test was conducted, comparing means between the intervention and control group for Attitudes Towards School at each time point. For Time 1, the assumption of homogeneity of variances was tested and satisfied via Levene's F test, $F(117) = .000$, $p = .996$. This independent samples t-test found no significant effect, $t(117) = .356$, $p = .722$. This finding is expected at baseline as no intervention has been disseminated. For Time 2, the assumption of homogeneity of variances was tested via Levene's F test, but it was not satisfied, $F(82) = 5.670$, $p = .020$. This independent samples t-test using the equal variances not assumed found no significant effect, $t(45.462) = -1.048$, $p = .300$. For Time 3, the assumption of homogeneity of variances was tested and satisfied via Levene's F test, $F(50) = .003$, $p = .959$. This independent samples t-test found no significant effect, $t(50) = -.101$, $p = .920$. For Time 4, the assumption of homogeneity of variances was tested and satisfied via Levene's F test, $F(52) = .424$, $p = .518$. This independent samples t-test found no significant effect, $t(52) = -.941$, $p = .351$. These results indicate that at no time point were intervention group participants found to have more positive Attitudes Towards School, compared to control group youth. To further explore program efficacy, this study explored the changes in scores on the Attitudes Towards School scale over time by conducting the paired samples t-test (see Table 3.1). No significant change in scores was found from baseline to end of the school year for either the intervention or control group. In addition, no significant differences were found in scores on this measure from baseline to six-month follow-up in either the intervention or control group.

Table 3.1. *Paired Samples T-Test for Attitudes Towards School Time Points*

Variables		N	*t*	df	*p*
Control Group					
	Attitudes Towards School: T1 and T3	6	-1.031	5	.350
	Attitudes Towards School: T1 and T4	9	-.252	8	.807
Intervention					
	Attitudes Towards School: T1 and T3	46	-.269	45	.789
	Attitudes Towards School: T1 and T4	45	-.633	44	.530

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.

In order to test the efficacy of the intervention, an independent samples *t*-test was conducted, comparing means between the intervention and control group for Sense of Inadequacy at each time point. For Time 1, the assumption of homogeneity of variances was tested and satisfied via Levene's *F* test, $F(116) = .598$, $p = .441$.This independent samples *t*-test found no significant effect, $t(116) = .782$, $p = .436$. This finding is expected at baseline as no intervention has been disseminated. For Time 2, the assumption of homogeneity of variances was tested and satisfied via Levene's *F* test, $F(81) = .005$, $p = .945$. This independent samples *t*-test found no significant effect, $t(81) = 1.406$, $p = .164$. For Time 3, the assumption of homogeneity of variances was tested and satisfied via Levene's *F* test, $F(50) = .388$, $p = .536$. This independent samples *t*-test found no significant effect, $t(50) = -.426$, $p = .672$. For Time 4, the assumption of homogeneity of variances was tested and satisfied via Levene's *F* test, $F(51) = .891$, $p = .350$. This independent samples *t*-test found no significant effect, $t(51) = -1.678$, $p = .099$. These results indicate that at no time point were intervention group participants found to have lower Sense of Inadequacy, compared to control group youth. To further explore program efficacy, this study explored the changes in scores on the Sense of Inadequacy scale over

time by conducting the paired samples t-test (see Table 3.2). No significant change in scores was found from baseline to end of the school year for either the intervention or control group. In addition, no significant differences were found in scores on this measure from baseline to six-month follow-up in either the intervention or control group.

Table 3.2. *Paired Samples T-Test for Sense of Inadequacy Time Points*

Variables		N	*t*	df	*p*
Control Group					
	Sense of Inadequacy: T1 and T3	7	.450	6	.668
	Sense of Inadequacy: T1 and T4	8	1.120	7	.300
Intervention					
	Sense of Inadequacy: T1 and T3	45	-1.554	44	.127
	Sense of Inadequacy: T1 and T4	45	.000	44	1

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.

Hypothesis C.

Hierarchical regressions were run to explore whether Attitudes Towards School and Sense of Inadequacy would predict core academic grades in youth over the course of one school year. Findings are represented in Tables 4.1- 4.4.

Table 4.1 presents hierarchical regressions, controlling for age and gender, as they were correlated with Science grades (T3) [r_{age} =.196; p_{age} =.011; r_{gender}=.188; p_{gender} =.009] and age was correlated with Sense of Inadequacy (T1) [r =.234; p =.008].

Table 4.1. *Attitudes Towards School and Sense of Inadequacy Predicting Science Grades with Controls*

Variables	*F*	Unstandardized β	*t*	Adjusted R^2	ΔR^2
Attitudes Towards School (T1)					
Step 1: Control variables: a/g	.118	-.038/.038	-.447/.208	-.026	.003
Step 2: Attitudes Towards School	.151	.011	.470	-.038	.003

Attitudes Towards School (T2)					
Step 1: Control variables: a/g	1.264	-.159/.223	-1.376/.985	.010	.048
Step 2: Attitudes Towards School	1.133	-.020	-.937	.008	.017
Attitudes Towards School (T3)					
Step 1: Control variables: a/g	.426	.023/.252	.111/.880	-.037	.028
Step 2: Attitudes Towards School	.338	-.014	-.430	-.066	.006
Sense of Inadequacy (T1)					
Step 1: Control variables: a/g	.118	-.038/.038	-.447/.208	-.026	.003
Step 2: Sense of Inadequacy	.112	.006	.322	-.040	.002
Sense of Inadequacy (T2)					
Step 1: Control variables: a/g	1.264	-.159/.223	-1.376/.985	.010	.048
Step 2: Sense of Inadequacy	1.106	-.017	-.895	.006	.015
Sense of Inadequacy (T3)					
Step 1: Control variables: a/g	.426	.023/.252	.111/.880	-.037	.028
Step 2: Sense of Inadequacy	1.821	-.051	-2.124*	.071	.131

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Control variables: age (a) and gender (g)
Sample Size (T1) = 71; Sample Size (T2) = 53; Sample Size (T3) = 33
Analyses were also conducted excluding the control variables. Results can be found in Appendix F. Results were consistent with the ones presented above.

Sense of Inadequacy at the end of year 1 (T3), did predict Science grades [$F(3,29) = 1.821$, $p = .042$ with a ΔR^2 of .131] at the end of the year when controlling for age and gender.

Table 4.2 presents hierarchical regressions conducted exploring whether Attitudes Towards School and/or Sense of Inadequacy predicts English grades at the end of the school year. Hierarchical regressions (controlling for gender) were conducted as gender was correlated with English grades [$r = .233$; $p = .002$] and age with Sense of Inadequacy (T1) [$r = .234$; $p = .008$].

Table 4.2. *Attitudes Towards School and Sense of Inadequacy Predicting English Grades with Controls*

Variables	*F*	Unstandardized β	*t*	Adjusted R^2	ΔR^2
Attitudes Towards School (T1)					
Step 1: Control variables: g	1.078	.150	1.038	.001	.013
Step 2: Attitudes Towards School	1.012	-.016	-.973	.000	.011
Attitudes Towards School (T2)					
Step 1: Control variables: g	.589	.130	.767	-.008	.011
Step 2: Attitudes Towards School	.683	-.014	-.883	-.012	.015
Attitudes Towards School (T3)					
Step 1: Control variables: g	.493	.131	.702	-.015	.015
Step 2: Attitudes Towards School	.684	-.021	-.937	-.019	.026
Sense of Inadequacy (T1)					
Step 1: Control variables: g/a	.218	-.011/-.044	-.075/-.653	-.023	.006
Step 2: Sense of Inadequacy	.230	-.007	-.507	-.034	.004
Sense of Inadequacy (T2)					
Step 1: Control variables: g	.589	.130	.767	-.008	.011
Step 2: Sense of Inadequacy	.502	-.009	-.650	-.019	.008
Sense of Inadequacy (T3)					
Step 1: Control variables: g	.493	.131	.702	-.015	.015
Step 2: Sense of Inadequacy	3.188	-.036	-2.411*	.114	.151

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Control variables: age (a) and gender (g); Age was also controlled for in regressions including Sense of Inadequacy (T1) as they are significantly correlated.
Sample Size (T1) = 85; Sample Size w/Control variable (T1) = 71; Sample Size (T2) = 55; Sample Size (T3) = 35
Analyses were also conducted excluding the control variables. Results can be found in Appendix F. Results were consistent with the ones presented above.

Sense of Inadequacy at the end of year 1 (T3), predicted English grades [$F(2,32) = 3.188$, $p = .022$ with a ΔR^2 of .151] at the end of the year when controlling for gender. Table 4.3 presents simple linear regressions conducted exploring whether Attitudes Towards School

and/or Sense of Inadequacy predicts mathematics grades at the end of the school year. When looking at Sense of Inadequacy (T1) predicting mathematics, a hierarchical regression (controlling for age) was conducted as age was correlated with Sense of Inadequacy (T1) [r =.234; p =.008].

Table 4.3. *Attitudes Towards School and Sense of Inadequacy Predicting Mathematics Grades*

Variables	F	Unstandardized β	t	Adjusted R^2	ΔR^2
Attitudes Towards School (T1)	3.229	-.038	-1.797	.026	-
Attitudes Towards School (T2)	1.760	-.032	-1.327	.014	-
Attitudes Towards School (T3)	.176	.015	.419	-.025	-
Sense of Inadequacy (T1)					
Step 1: Control variable	8.567	-.267	-2.927	.098	.110
Step 2: Sense of Inadequacy	4.981	-.023	-1.163	.102	.017
Sense of Inadequacy (T2)	3.853	-.040	-1.963*	.050	-
Sense of Inadequacy (T3)	1.183	-.027	-1.087	.005	-

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Control variables: age (a)
Sample Size (T1) = 85; Sample Size w/Control variable (T1) = 71; Sample Size (T2) = 55; Sample Size (T3) = 35

Results revealed that in the middle of the school year (T2), Sense of Inadequacy also predicted Mathematics grades [$F(1,53) = 3.853$, p = .055 with an adjusted R^2 of .050] at the end of the school year. Table 4.4 presents hierarchical regressions conducted exploring whether Attitudes Towards School and/or Sense of Inadequacy predicts Non-Core Subjects grades at the end of the school year. Hierarchical regressions (controlling for gender and age) were conducted as gender and age were correlated with Non-Core Subjects grades (T3) [r_{age} =.163; p_{age} =.036; r_{gender}=.265; p_{gender} =.000] and age with Sense of Inadequacy (T1) [r =.234; p =.008].

Table 4.4. *Attitudes Towards School and Sense of Inadequacy Predicting Non-Core Subjects Grades with Controls*

Variables	*F*	Unstandardized β	*t*	Adjusted R^2	ΔR^2
Attitudes Towards School (T1)					
Step 1: Control variables: a/g	.212	-.039/.075	-.499/.439	-.023	.006
Step 2: Attitudes Towards School	.142	-.002	-.078	-.038	.000
Attitudes Towards School (T2)					
Step 1: Control variables: a/g	.842	-.100/.218	-.924/1.034	-.006	.033
Step 2: Attitudes Towards School	1.916	-.039	-1.991*	.050	.072
Attitudes Towards School (T3)					
Step 1: Control variables: a/g	1.044	.118/.329	.588/1.190	.003	.065
Step 2: Attitudes Towards School	.674	.002	.058	-.032	.000
Sense of Inadequacy (T1)					
Step 1: Control variables: a/g	.212	-.039/.075	-.499/.439	-.023	.006
Step 2: Sense of Inadequacy	.321	-.013	-.736	-.030	.008
Sense of Inadequacy (T2)					
Step 1: Control variables: a/g	.842	-.100/.218	-.924/1.034	-.006	.033
Step 2: Sense of Inadequacy	2.565	-.325	.2.418*	.083	.103
Sense of Inadequacy (T3)					
Step 1: Control variables: a/g	1.044	.201/.276	.588/1.190	.003	.065
Step 2: Sense of Inadequacy	1.356	-.033	-1.384	.032	.058

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Control variables: age (a) and gender (g)
Sample Size (T1) = 71; Sample Size (T2) = 53; Sample Size (T3) = 33
Analyses were also conducted excluding the control variables. Results can be found in Appendix F. Results were consistent with the ones presented above.

Results revealed that Attitudes Towards School in the middle of the year (T2) predicted Non-Core Subjects grades [$F(3,49) = 1.916$; p = .052 with a ΔR^2 of .072] at the end of the year when controlling for age and gender. Sense of Inadequacy in the middle of the year (T2) also predicted Non-Core Subjects grades [$F(3,49) = 2.565$; p=.019 with a ΔR^2

of .103] at the end of the year when controlling for age and gender.

Hypothesis D.

Cross sectional mediation analyses were conducted using PROCESS macro by Preacher and Hayes, to explore if Attitudes Towards School and Sense of Inadequacy mediate the relationship between intervention dosage and core academic grades (i.e., Science, English, Mathematics, Non-Core Subjects). When cleaning the dataset only thirty-seven cases contained the key mediation variables to run these analyses. To decide whether any covariates would be necessary within this small subset of the data, correlations were run between age, gender and model variables. Age was found to have a significant correlation with intervention dosage [r = -.274, p = .003] (Table 5.1) and thusly was controlled. Gender was not correlated with any of the model variables in this subset of the data and was not used as a covariate in these mediation analyses.

Table 5.1. *Correlations between Age and Intervention Dosage*

Variables	1	2
1. Age	-	
2. Intervention Dosage (T3)	-.274**	
Sample Size	119	-

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Table 5.2. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Science Grades While Controlling for Age*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0000	-.0002, .0001	-	-	-.6009/*.5479*
Path a	-.0013	21	.8897	.3837	-
Path b	.0254	20	.7855	.4414	-
Path c	.0001	21	.4321	.6701	-

Path c'	.0001	20	.6525	.5215	-
Control: age	.1754	20	1.3875	.1806	-
Sense of Inadequacy (All)	.0000	-.0002, .0001	-	-	-.2574/*.7969*
Path a	-.0003	21	-.3215	.7510	-
Path b	.0349	20	1.4032	.1759	-
Path c	.0001	21	.4321	.6701	-
Path c'	.0001	20	.5391	.5958	-
Control: age	.1723	20	1.4069	.1748	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 24
Analyses were also conducted excluding the control variables. Results can be found in Appendix G. Results were consistent with the ones presented above.

Table 5.2 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between intervention dosage and science controlling for age. Neither Attitudes Towards School (95% CI = -.0002, .0001, z = -.6009, p = .5479) nor Sense of Inadequacy (95% CI = -.0002, .0001, z = -.2574, p = .7969) served as significant mediators of the relationship between intervention dosage and science grades when controlling for age.

Table 5.3. *ATS and SIN Mediates the Relationship Between Intervention Dosage and English Grades While Controlling for Age*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0001	-.0002, .0001	-	-	-.9575/*.3383*
Path a	-.0013	21	-1.5104	.1458	-
Path b	.0446	20	1.4847	.1532	-
Path c	.0001	21	.6357	.5319	-
Path c'	.0001	20	1.0855	.2906	-
Control: age	.1364	20	1.1629	.2585	-
Sense of Inadequacy (All)	.0000	-.2626, .1160	-	-	-.2356/.8137

Path a	-.0003	21	-.3215	.7510	-
Path b	.0275	20	1.1317	.2711	-
Path c	.0001	21	.6357	.5319	-
Path c'	.0001	20	.7175	.4813	-
Control: age	.1363	20	1.1378	.2686	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 24
Analyses were also conducted excluding the control variables. Results can be found in Appendix G. Results were consistent with the ones presented above.

Table 5.3 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between intervention dosage and English controlling for age. Neither Attitudes Towards School (95% CI = -.0002, .0001, z = -.9575, p = .3383) nor Sense of Inadequacy (95% CI = -.2626, .1160, z = -.2356, p = .8137) served as significant mediators of the relationship between intervention dosage and English grades controlling for age.

Table 5.4. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Mathematics Grades While Controlling for Age*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0001	-.0002, .0001	-	-	-.7440/*.4569*
Path a	-.0013	21	-1.5104	.1458	-
Path b	.0410	20	1.0253	.3175	-
Path c	.0001	21	.5509	.5875	-
Path c'	.0001	20	.8448	.4082	-
Control: age	-.0847	20	-.5423	.5936	-
Sense of Inadequacy (All)	.0000	-.0002, .0001	-	-	-.1747/*.8613*
Path a	-.0003	21	-.3215	.7510	-
Path b	.0219	20	.6797	.5045	-
Path c	.0001	21	.5509	.5875	-

Path c'	.0001	20	.5901	.5618	-
Control: age	-.0842	20	-.5314	.6010	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 24
Analyses were also conducted excluding the control variables. Results can be found in Appendix G. Results were consistent with the ones presented above.

Table 5.4 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between intervention dosage and mathematics controlling for age. Neither Attitudes Towards School (95% CI = -.0002, .0001, z = -.7440, p = .4569) nor Sense of Inadequacy (95% CI = -.0002, .0001, z = -.1747, p = .8613) served as significant mediators of the relationship between intervention dosage and mathematics grades controlling for age.

Table 5.5. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Non-Core Subjects Grades While Controlling for Age*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0000	-.0001, .0001	-	-	.4345/*.6640*
Path a	-.0013	21	.8897	.3837	-
Path b	-.0141	20	-.5440	.5924	-
Path c	.0001	21	1.4647	.1578	-
Path c'	.0001	20	1.1973	.2452	-
Control: age	.1714	20	1.6992	.1048	
Sense of Inadequacy (All)	.0000	-.0001, .0001	-	-	-.0139/*.9889*
Path a	-.0003	21	-.3215	.7510	-
Path b	.0009	20	.0455	.9642	-
Path c	.0001	21	1.4647	.1578	-
Path c'	.0001	20	1.4292	.1684	-
Control: age	.1699	20	1.6717	.1102	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.

Confidence Intervals at 95%
Sample Size = 24
Analyses were also conducted excluding the control variables. Results can be found in Appendix G. Results were consistent with the ones presented above.

Table 5.5 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between intervention dosage and Non-Core Subjects, controlling for age. Neither Attitudes Towards School (95% CI = -.0001, .0001, z = .4345, p = .6640) nor Sense of Inadequacy (95% CI = -.0001, .0001, z = -.0139, p = .9889) served as significant mediators of the relationship between intervention dosage and Non-Core Subjects grades controlling for age.

To maximize sample size, supplemental analyses were conducted to test whether mediation hypotheses would be supported with group designation as the independent variable rather than dosage. All mediation analyses conducted were also run while controlling for age as correlations were found between it and group designation [r = -.201, p = .003] and Science grades (T3) [r = .196, p = .011] for the cases included in these analyses (refer to Table 5.6).

Table 5.6 *Correlations between Age and Group Designation and Science Grades*

Variables	1	2	3
1. Age	-		
2. Group Designation	-.201**	-	-
Degrees of Freedom	215	-	-
3. Science (T3)	.196*	-	-
Degrees of Freedom	166	-	-

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Gender was controlled during three of the mediation analyses due to its significant

correlations with Science (T3) [r = .188, p = .009], English (T3) [r =.223, p = .002] and Non-Core Subjects grades (T3) [r = .265, p = .000] for the cases included in these analyses (refer to Table 5.7).

Table 5.7 *Correlations between Gender, English, Science and Non-Core Subjects Grades*

Variables	1	2	3
Gender	-		
English (T3)	.223**	-	-
Degrees of Freedom	189	-	-
Science (T3)	. 188**	-	-
Degrees of Freedom	194	-	-
Non-Core Subjects (T3)	.265**	-	-
Degrees of Freedom	194	-	-

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Table 5.8. *Test of ATS and SIN as Mediators of the Relationship Between Group Designation and Science Grades While Controlling for Age and Gender*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0033	-.1251, .0532	-	-	-.0758/*.9396*
Path a	.9812	60	.6033	.5486	-
Path b	-.0034	59	-.1479	.8829	-
Path c	-.1097	60	-.3825	.7035	-
Path c'	-.1064	59	-.3667	.7151	-
Control: age	.0653	59	.7196	.4746	-
Control: gender	-.1151	59	-.5945	.5544	-
Sense of Inadequacy (All)	-.0044	-.1018, .0555	-	-	-.1048/*.9166*
Path a	.8716	60	.4419	.6602	-
Path b	-.0050	59	-.2669	.7905	-
Path c	-.1097	60	-.3825	.7035	-
Path c'	-.1053	59	-.3637	.7174	-
Control: age	.0677	59	.7422	.4609	-

Control: gender	-.1172	59	-.6089	.5449	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 64
Analyses were also conducted excluding the control variables. Results can be found in Appendix H. Results were consistent with the ones presented above.

Table 5.8 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between group designation and science controlling for age and gender. Neither Attitudes Towards School (95% CI = -.1251, .0532, z = -.0758, *p* = .9396) nor Sense of Inadequacy (95% CI = -.1018, .0555, z = -.1048, *p* = .9166) served as significant mediators of the relationship between group designation and science grades controlling for age and gender.

Table 5.9. *Test of ATS and SIN as Mediators of the Relationship Between Group Designation and English Grades While Controlling for Age and Gender*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0046	-.0974, .0494	-	-	-.1294/*.8970*
Path a	.9812	60	.6033	.5486	-
Path b	-.0047	59	-.2564	.7985	-
Path c	-.0365	60	-.1589	.8743	-
Path c'	-.0319	59	-.1373	.8913	-
Control: age	.0123	59	.1688	.8665	-
Control: gender	-.0947	59	-.6114	.5433	-
Sense of Inadequacy (All)	-.0107	-.1195, .0393	-	-	-.2632/*.7924*
Path a	.8716	60	.4419	.6602	-
Path b	-.0122	59	-.8110	.4207	-
Path c	-.0365	60	-.1589	.8743	-
Path c'	-.0258	59	-.1120	.9112	-
Control: age	.0201	59	.2764	.7832	-
Control: gender	-.1048	59	-.6837	.4969	-

*. Relationship significant at the 0.05 level.

**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 64
Analyses were also conducted excluding the control variables. Results can be found in Appendix H. Results were consistent with the ones presented above.

Table 5.9 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between group designation and English, controlling for age and gender. Neither Attitudes Towards School (95% CI = -.0974, .0494, z = -.1294, *p* = .8970) nor Sense of Inadequacy (95% CI = -.1195, .0393, z = -.2632, p = .7924) served as significant mediators of the relationship between group designation and English grades controlling for age and gender.

Table 5.10. *Test of ATS and SIN as Mediators of the Relationship Between Group Designation and Mathematics While Controlling for Age*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0199	-.1529, .0489	-	-	-.3293/*.7419*
Path a	1.3955	61	.8696	.3879	-
Path b	-.0138	60	-.5422	.5897	-
Path c	-.0183	61	-.0579	.9540	-
Path c'	.0009	60	.0028	.9978	-
Control: Age	-.1619	60	-1.6089	.1129	-
Sense of Inadequacy (All)	-.0303	-.1869, .0602	-	-	-.5086/*.6110*
Path a	1.2758	61	.6587	.5126	-
Path b	-.0302	60	-1.4548	.1509	-
Path c	-.0183	61	-.0579	.9540	-
Path c'	-.0202	60	.0641	.9491	-
Control: Age	-.1453	60	-1.4576	.1502	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 64
Analyses were also conducted excluding the control variables. Results can be found in Appendix H. Results were consistent with the ones presented above.

Table 5.10 presents Attitudes Towards Schools and Sense of Inadequacy mediating the relationship between group designation and mathematics, controlling for age and gender. Neither Attitudes Towards School (95% CI =-.1529, .0489, z = -.3293, *p* = .7419) nor Sense of Inadequacy (95% CI = -.1869, .0602, z = -.5086, p = .6110) served as significant mediators of the relationship between group designation and mathematics grades controlling for age.

Table 5.11. *Test of ATS and SIN as Mediators of the Relationship Between Group Designation and Non-Core Subjects Grades While Controlling for Age and Gender*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	-.0210	-.1482, .0314	-	-	-.3907/*.6961*
Path a	.9812	60	.6033	.5486	-
Path b	-.0214	59	-.9923	.3251	-
Path c	-.2380	60	-.8774	.3838	-
Path c'	-.2170	59	-.7976	.4283	-
Control: Age	.0722	59	.8486	.3996	-
Control: Gender	-.0825	59	-.4544	.6512	-
Sense of Inadequacy (All)	-.0211	-.1641, .0487	-	-	-.3457/*.7296*
Path a	.8716	60	.4419	.6602	-
Path b	-.0242	59	-1.3735	.1748	-
Path c	-.2380	60	-.8774	.3838	-
Path c'	-.2169	59	-.8042	.4245	-
Control: Age	.0806	59	.9489	.3466	-
Control: Gender	-.0857	59	-.4777	.6346	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 64
Analyses were also conducted excluding the control variables. Results can be found in Appendix H. Results were consistent with the ones presented above.

Table 5.11 presents Attitudes Towards Schools and Sense of Inadequacy mediating the

relationship between group designation and Non-Core Subjects, controlling for age and gender. Neither Attitudes Towards School (95% CI = -.1482, .0314, z = -.3907, p = .6961) nor Sense of Inadequacy (95% CI = -.1641, .0487, z = -.3457, p = .7296) served as significant mediators of the relationship between group designation and Non-Core Subjects grades controlling for age and gender.

DISCUSSION

The goal of the current study was to take part in evaluating a trauma-informed mentorship program serving urban youth of color in the inner city of Chicago. It is important to the researchers and interventionists connected to this mentorship program to understand the underpinnings that can make mentorship an invaluable tool for youth. This study hoped to uncover the "how" of mentorship with the ultimate intent to inform curriculum creation, training protocols, and intervention implementation. This study sought to explore four core questions: 1) Are Attitudes Towards School and Sense of Inadequacy associated with group designation (control v. intervention)? 2) Do students in the intervention group have more positive attitudes towards school and less feelings of inadequacy at the end of the school year and at follow-up than control group youth? Do negative attitudes towards school and high levels of self-reported feelings of inadequacy decrease in intervention group youth over time? 3) Does Attitudes Towards Schools and Sense of Inadequacy predict English, Science, and Mathematics grades in youth? 4) Do Attitudes Toward School and Sense of Inadequacy respectively, mediate the relationship between the intervention dosage (i.e., time spent with mentors) and academic achievement (i.e., Science, English, Mathematics, and Non-Core Subjects)? It was hypothesized that the intervention would contribute to improved grades and that reductions in negative

attitudes towards school and self-reported feelings of inadequacy would mediate that effect. Unfortunately, these hypotheses were not supported. In order to make sense of the unexpected findings, all associations with the main variables in the study will be interpreted.

Associations with Demographic Variables

It is essential that preliminary associations between demographic variables and study variables are explored first. This provides us with basic knowledge about how gender and age may influence outcomes and clarity on when to control for these variables that are not of direct interest. In this study, age was significantly correlated with group designation and intervention dosage. These negative correlations indicate that older participants appeared more often in the control group and thus received less or no hours of the intervention. It makes sense to have found correlations for both group designation and intervention dosage with age, as youth in the control group by virtue of their group designation received zero hours of intervention dosage. The Cities Project intervention did implement a waitlist control model that allowed all youth on the waitlist access to the mentoring program. This means that all children enrolled in the study had the opportunity to join the intervention. This waitlist control model was implemented as the program was not funded by any grants during this data collection period, and clinical decision making prevailed with a focus on serving as many students as possible. This means that older students and/or their families represented in these analyses had voluntarily chosen to remain in the control group. There are several reasons why older students and/or their families may have opted out of joining the intervention: 1) not wanting to engage with younger students, 2) embarrassment due to repeating a grade, 3) distrust of school and/or

programming and/or less connection to their school in general, or 4) satisfaction with their existing mentoring network.

Age was also positively correlated with Sense of Inadequacy (Time 1). This result reveals that in our sample, older students presented with more feelings of inadequacy than their younger counterparts. This provides some support for the hypothesis that older youth who chose to remain in the control group may have felt less connected to their school. It is interesting to note, however, that these youth did not achieve lower grades than youth in the intervention or younger youth. In fact, older youth achieved higher grades than younger youth. This pattern of findings provides some support for the hypothesized explanation that older and control group youth may have chosen not to engage in the intervention due to distrust of school programming and/or overall lack of connection to their schools. Additional research is needed to determine which of these hypothesized explanations is most valid.

Both age and gender were positively correlated with Science and Non-Core Subjects grades. These results indicate that older and female participants performed better in Science and Non-Core Subjects. Gender solely was positively correlated with English grades, meaning that female students performed better in the subject than their male counterparts. The gender specific findings are consistent with literature demonstrating particularly negative effects of the achievement gap on African American males. African American males are at higher risk for school failure, special education assignment, suspensions and expulsions (Ferguson, 2000; Polite & Davis, 1999). Differences in school engagement and achievement between African American boys and girls can be traced back to early childhood. Black boys lack confidence in their abilities in school and speak

up less in class in comparison to Black girls beginning as early as six years old (U.S. Department of Education, National Center for Education Statistics, 1993).

Association between Intervention, Outcomes and Mediators

As expected, perceived sense of inadequacy was predictive of grades across multiple time points. There were correlations between a youth's Sense of Inadequacy at baseline (T1) and mathematics grades at the end of the school year (T3) controlling for gender and age. Sense of Inadequacy at baseline (T1), in the middle (T2), and at the end of the school year (T3) was correlated with English grades at the end of the year (T3) when controlling for age and gender. These results reveal that students with less feelings of inadequacy at baseline perform better in math and English at the end of the school year. It also shows that students with lower levels of inadequacy across the length of the study perform better in English. The current study also found that in this sample, Sense of Inadequacy (T3) at the end of the school year predicted science grades (T3), controlling for age and gender, and English grades (T3), controlling for gender at the end of the school year (T3).

The current study found no significant correlations between Attitudes Towards School and core academic grades controlling for gender and age, but Attitudes Towards School in the middle of the year (T2) was negatively correlated with and did predict Non-Core grades (T3) at the end of the school year. It was unexpected to have so many fewer findings for Attitudes Towards School (relative to Sense of Inadequacy) as prior research has shown that students who have more positive views towards school or who are satisfied with school outperform their less satisfied counterparts (Brodie, 1964). One possible explanation is that the stressors of urban poverty have compromised schools in such a way

that youth are unlikely to feel good about their schools especially in relation to more positive representations they see in the media. This hypothesized explanation is consistent with multiple studies that have established multiple ways in which urban poverty negatively affects schools (Cherniss, & Adler, 2000; Elias et al., 2003; Evans, 2004).

Furthermore, it is critical to note the impact that cultural incongruence has on the learning experiences of minority youth in the education system. It is important to understand that the U.S. school system has been built on European American values and practices and represents a culture that better resembles that of European-American communities than that of the diversity that exists in this country (Banks, 1988). Studies have found that achievement gaps decrease when culturally congruent instructional contexts are implemented centering the Black Cultural Ethos (BCE) (Parsons, 2005). When school instruction incorporates the culture of the students, learning cues are more discernible as are meaningfulness and relevance of the content so that students become more engaged, attentive and motivated (Boykin, 1994; Tharp, 1989). Providing culturally congruent instruction also alleviates symbolic violence in instruction material. There are often practices, materials, or lack of DEI knowledge in teaching staff that perpetuates the defaming, devaluing, and excluding of norms, beliefs, and practices of minority students that do not align with institutionalized ones (Powell, 1997). With students learning in school systems that do not teach or test using culturally congruent approaches, not only will students' connection to school be affected but also their learning and general sense of belonging. This learning environment presents an additional barrier to our students' academic success and likely requires more intensive services to help mitigate this impact.

Results of Analyses Testing Primary Hypotheses

The current study found no correlations between intervention dosage (i.e., time spent with mentors) or group designation (i.e. control group youth vs. mentored/intervention group youth) and academic grades. The current study also found no significant correlations between group designation (i.e., control group youth vs. mentored/intervention group youth) and Attitudes Towards School or Sense of Inadequacy controlling for age (see Appendix I). At no time point were intervention group participants found to have significantly less feelings of inadequacy or more positive attitudes towards school compared to control group youth. The intervention group also showed no significant improvement from baseline to the end of the school year (T3) or from baseline to follow-up (T4). No significant trends emerged in regard to more positive attitudes towards school from baseline to the end of the school year (T3) or from baseline to follow-up (T4) for intervention group youth. Finally, neither Attitudes Towards School nor Sense of Inadequacy mediated the relationship between intervention dosage and academic achievement or group designation and academic achievement. This follows directly from the lack of strong and consistent associations between primary study variables summarized above and interpreted below.

Prior literature has shown a relationship between engagement in mentoring and social and emotional outcomes and academic achievement, although in a meta-analysis of 55 youth mentoring programs these effects were found to be modest (Dubois et al., 2002). Two primary explanations for these unexpected effects are provided below. The first is focused on reasons why the intervention may not have been effective for youth in this sample. The second is focused on limitations of the study, which may have precluded finding any potential effects.

Limitations of the Intervention: With mentoring programs experiencing only modest effect sizes and youth residing in urban poverty experiencing major stressors, higher doses of the intervention to mitigate the impact of their current circumstances may be necessary. Youth living in environments affected by extreme levels of poverty, community violence and systemic divestment likely need intensive and long-term support to counteract the stressors taking place in these communities.

Beyond limited dosage, there are additional limitations of the intervention that could have contributed to lack of effects. In particular, the intervention did not implement several best practices that have been associated with better outcomes in meta-analyses of mentoring interventions: parent involvement, selecting mentors with background in helping profession/role, and conducting sessions outside of the school setting (DuBois, 2002). The Cities Project could improve on the engagement with families. Family members are invited to attend three quarterly advisory boards and three quarterly Saturday field trips, and mentors are expected to engage with families and attend mentor-parent-teacher conferences, but family engagement is generally low. In addition, mentors are not selected based on any work history or specific major. Mentors are chosen based on interest and availability. Some mentors participating have never worked with children or adolescents before. Thus, although the program provides considerably more supervision and training than most mentoring programs (DuBois et al., 2012) training content and material could be drastically enhanced to more fully prepare mentors for the experience especially given that (although youth generally prefer younger mentors), college students have been found to be less effective than older mentors in some studies (Rhodes). Finally, sessions occur on school premises, which has not been associated with gains as large as

those found when mentors work with youth outside of structured settings. The original pilot of the Cities Mentor Project included a larger community-based component, and that pilot yielded larger effects than this one (Duffy et al., 2022). But that pilot also did not suffer from study limitations that may have contributed to the lack of effects in this study. These are described below.

Limitations of the Study:

Attrition

Attrition across the school year for each cohort impacted the sample size of the current study. It is not unusual for youth living in urban environments to suffer from chronic absences and housing instability (Aviles & Grigalunas, 2018). Chronic absenteeism is extremely prevalent in elementary school in urban cities (Balfanz & Byrnes, 2012; Chang & Romero, 2008; Connolly & Olson, 2012; Romero & Lee, 2007). This absenteeism over the course of the school year impacted our sample size across time points. Students who were not attending school consistently were not only less likely to get sufficient dosage of the intervention (i.e., time spent with a mentor), but also were hard to follow-up with at various time points. Housing instability also made it difficult for us to keep current contact information with study participants. It would not be unusual for our students to move and change telephone numbers or even change schools completely. This affected both the youth's participation in the intervention, but also in data collections. Due to limited personpower the Cities Project was not able to track down and collect data from these families. We had the most participation at Time 1 and the lowest at Time 4. Sample size limitations and/ or attrition may have limited power to detect potentially significant effects.

It is important to note that the first pilot study conducted of the Cities Mentor Project also included a small sample (though the group sizes were more even with 16 intervention and 19 control) but no attrition, and effect sizes were considerably larger in that pilot (Duffy et al., 2022). In particular, the intervention group earned better grades in reading, and improvements in teacher-reported adaptive skills approached significance as did youth reported reductions in internalizing problems. Intervention dosage also significantly predicted higher mathematics grades, better parent-reported adaptive skills and less parent-reported behavioral problems, less youth-reported school problems, less youth reported internalizing problems, less youth reported inattentive/ hyperactivity problems, and fewer youth-reported emotional symptoms. Therefore, it is possible that the dramatic differences in attrition between the two pilots may have accounted for differences in effects. Another striking methodological difference between the two studies is the use of a traditional control group in the original pilot and the use of a wait-list control in this study.

Wait-List Control Model

The youth in this study participated during a period that the program utilized a waitlist control model as the grant that had funded the original pilot had been completed so the priority shifted from research design to clinical utility. Students and/or families were able to opt into the intervention group. This is not best practice in regard to research design and may have affected the results of the current study. As seen in the current study, older youth and/or their families opted not to participate in the intervention. This model is not optimal when aiming to ensure that variables beyond intervention participation are not influencing who ends up in each group.

Data Collection Issues

There are several data collection limitations that may have impacted this study. The way that intervention dosage data was collected may have contributed to the lack of findings. For a large part of the current study, intervention dosage data was collected once every month using paper forms. Although originally this seemed like a reasonable time window to collect data, it likely is too long of a period for mentors to accurately report all interactions with their mentee, especially extremely active mentor-protégé pairs. There were also mentors who did not consistently complete the monthly time logs, so no data could be collected from that pair. Lastly, the use of paper forms created room for potential data entry error, missing data, and illegible logs. During the original pilot that was grant-funded, there was greater attention and funding provided to data collection. Moving forward the Cities Project has begun to use Redcap, an online survey management system.

Conclusions and Implications for Clinical Practice and Future Research

Although not fully consistent with each other, the lack of findings in the current study and the modest effects of the original Cities Mentor Project pilot (Duffy et. al., 2022) are in alignment with meta-analytic and evaluative studies exploring the effects of mentoring and other youth focused mental health preventative programs. Researchers have found that mentoring programs are variable in their outcomes and, on average, produces only modest effects in comparison to other intervention types (Durlak & Wells, 1997, 1998; Cohen, 1988; Lipsey, 1990; Dubois et. al., 2002). Even mentoring programs that are well-established are not quantitatively effective all the time. The current study provides the Cities Project interventionists with useful data on how to better implement and evaluate the intervention in hopes of increasing positive impact for youth.

It is important for the field to understand how to maximize on the moderate effect sizes of mentorship. There are huge efforts, especially in Chicago Public Schools, to provide mentorship opportunities at all schools to help bolster urban youths' academic and social emotional performance. To ensure a meaningful return on invested resources (i.e., money, time), it is essential to understand in what ways mentoring impacts the success of our students. Studies should continue to explore various constructs (i.e., resilience, grit) that may influence student outcomes. Identifying these mechanisms and understanding the ways they influence our students allow us to refine training protocols and intervention content to ensure we are providing the best clinical services to the youth who need it most.

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APPENDIX

Appendix A. Matrix Consisting of All Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Age	-																					
2. Gender	.030	-																				
3. Intervention Dosage	-.274**	-.123	-																			
4. Group Designation	-.201**	-.033	.686**	-																		
5. Non-Core Grades (T3)(Med)	.322	.094	.096	.025																		
6. Science (T3)(Med)	.291	.057	.123	.176	.649**																	
7. English (T3)(Med)	.238	.014	.034	-.121	.648**																	
8. Mathematics (T3)(Med)	-.118	-.097	-.004	-.151	.602**	.557**	.785**	-														

9. Non-Core Grades (T3)	.163*	.265**	-.021	-.024	1**	.649**	.648**	.602**	-								
10. Science (T3)	.196*	.188**	.053	.072	.649**	1**	.674**	.557**	.722**	-							
11. English (T3)	.134	.223**	-.036	.048	.648**	.674**	1**	.785**	.666**	.684**							
12. Mathematics (T3)	-.136	.142	.039	.075	.602**	.557**	.785**	1**	.555**	.598**	.700**	-					
13. SIN (T1)	.234**	-.048	-.214*	-.072	-.248	-.087	-.233	-.281	-.181	-.082	-.233*	-.306**	-				
14. SIN (T2)	.139	.093	-.074	-.154	-.036	-.149	-.025	-.036	-.247	-.065	-.068	-.260	-.325**	-			
15. SIN (T3)	-.066	-.170	.033	.060	-.065	-.105	-.467	-.174	-.264	-.334*	-.402*	-.186	-.369**	.540**	-		
16. SIN (T4)	.027	-.066	-.030	.229	.031	-.244	.292	.250	-.076	-.171	.027	-.120	-.431**	.481**	.494**	-	
17. ATS (T1)	.162	-.108	-.213*	-.033	-.345*	-.228	-.138	-.171	-.152	-.115	-.124	-.194	-.660**	.209*	.217	.326*	-
18. ATS (T2)	-.058	.037	-.008	.083	-.275	-.082	-.158	-.024	-.249	-.108	-.114	-.179	-.201	.685**	.398**	.534**	.279**

19. ATS (T3)	.206	-.163	.046	.014	-.527	-.204	-.171	-.087	-.016	-.089	-.173	-.073	.111	.303*	.407*	.409*	.365*	.536*	-		
20. ATS (T4)	.082	.011	-.137	.129	-.039	-.066	.426	.270	-.062	-.179	.127	.012	.073	.193	.296	.551*	.214	.403*	.449*	-	
21. SIN- (Mean of T1-T3) (Med)	.168	-.048	-.097	-.013	.226	-.047	-.167	-.209	.228*	-.100	.182	.289*	.862*	.832**	.830*	.616*	.589*	.569*	.370*	.246	-
22. ATS-(Mean of T1-T3) (Med)	.112	-.144	-.098	.022	-.440**	-.239	-.183	-.191	.225*	-.134	.176	.219*	.582*	.569**	.428*	.489*	.858*	.821*	.819*	.389*	.685**

Med = Variable used for the proposed mediation models.

Mean of T1-T3 = Represents the statistical average of time points 1 through 3

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix B. Behavior Assessment System for Children, Third Edition (BASC™-3) Scales

Attitude to School (SRP-Child)

5. I don't like thinking about school. (True/False)
16. I don't care about school. (True/False)
21. I can't wait for school to be over. (True/False)
70. I hate school. (Never/Sometimes/Often/Almost Always)
77. My school feels good to me. (Never/Sometimes/Often/Almost Always)
98. I feel safe at school. (Never/Sometimes/Often/Almost Always)
119. I feel like I want to quit school. (Never/Sometimes/Often/Almost Always)
131. School is boring. (Never/Sometimes/Often/Almost Always)

Sense of Inadequacy (SRP-Child)

8. I never seem to get anything right. (True/False)
54. When I take tests, I can't think. (Never/Sometimes/Often/Almost Always)
63. I want to do better, but I can't. (Never/Sometimes/Often/Almost Always)
68. I am disappointed with my grades. (Never/Sometimes/Often/Almost Always)
78. It is hard for me to keep my mind on schoolwork. (Never/Sometimes/Often/Almost Always)
90. People tell me to try harder. (Never/Sometimes/Often/Almost Always)
108. Even when I try hard, I fail. (Never/Sometimes/Often/Almost Always)
124. I fail at things. (Never/Sometimes/Often/Almost Always)

Attitude to School (SRP-Adolescent)

5. I don't like thinking about school. (True/False)
20. I don't care about school.(True/False)
87. My school feels good to me. (Never/Sometimes/Often/Almost Always)
101. School is boring. (Never/Sometimes/Often/Almost Always)
107. I feel safe at school. (Never/Sometimes/Often/Almost Always)
150. I get bored in school. (Never/Sometimes/Often/Almost Always)
162. I feel like I want to quit school. (Never/Sometimes/Often/Almost Always)
184. I hate school. (Never/Sometimes/Often/Almost Always)

Sense of Inadequacy (SRP-Adolescent)

23. I never seem to get anything right. (True/False)
36. Doing my best is never good enough. (True/False)
45. I never quite reach my goal. (True/False)
53. Most things are harder for me than for others. (True/False)
57. I'd rather quit than fail. (True/False)
60. I quit easily. (Never/Sometimes/Often/Almost Always)
72. When I take tests, I can't think. (Never/Sometimes/Often/Almost Always)
77. I am disappointed with my grades. (Never/Sometimes/Often/Almost Always)
126. I fail at things. (Never/Sometimes/Often/Almost Always)
135. Even when I try hard, I fail. (Never/Sometimes/Often/Almost Always)

141. I want to do better, but I can't. (Never/Sometimes/Often/Almost Always)
147. People tell me to try harder. (Never/Sometimes/Often/Almost Always)

Appendix C. Classes included in Averaged Grades

Grades were averaged using statistical mean in SPSS.

Science
Science Lab
Science Standards

Mathematics
Algebra
Mathematics
Mathematics Lab
Mathematics Standards

English
Chicago Reading Framework
Reading
Writing
Writing Standards

Non-Core
Art
Dual Language
Elective
Health Education
Learning Technology
Library Science
Listening
Listening Standards
Music
Physical Education
Research
Research Standards
Social Science
Speaking
Speaking Standards
World Language

Appendix D. Group Designation and Intervention Dosage Correlated with Attitudes Towards School and Sense of Inadequacy (No Covariates)

Table 1. *Attitudes Towards School and Group Designation: Correlations (No Covariates)*

Variables		1	2	3	4	5
1. Group Designation		-				
2. Attitudes Towards School (T1)		-.033	-			
	Sample Size	119				
3. Attitudes Towards School (T2)		.083	.279**	-		
	Sample Size	84	91			
4. Attitudes Towards School (T3)		.014	.365**	.536**	-	
	Sample Size	52	52	49		
5. Attitudes Towards School (T4)		.129	.214	.403**	.449**	-
	Sample Size	54	58	50	40	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

No significant correlations between group designation and Attitudes Towards School were found.

Table 2. *Attitudes Towards School and Dosage: Correlations (No Covariates)*

Variables		1	2	3	4	5
1. Intervention Dosage		-				
2. Attitudes Towards School (T1)		-.213*	-			
	Sample Size	96				
3. Attitudes Towards School (T2)		-.008	.279**	-		
	Sample Size	65	91			
4. Attitudes Towards School (T3)		.046	.365**	.536**	-	
	Sample Size	31	52	49		
5. Attitudes Towards School (T4)		-.137	.214	.403**	.449**	-
	Sample Size	36	58	50	40	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed)

Significant correlations between intervention dosage and Attitudes Toward School at time point one (T1), $r = -.213$, $p = .038$. These results suggest that the more negative a participant's Attitudes Toward School was at the beginning of the school year, the more time they spent participating in the intervention throughout the rest of the year.

Table 3. *Sense of Inadequacy and Group Designation: Correlations (No Covariates)*

Variables		1	2	3	4	5
1. Group Designation		-				
2. Sense of Inadequacy (T1)		-.072	-			
	Sample Size	118				
3. Sense of Inadequacy (T2)		-.154	.325**	-		
	Sample Size	83	90			
4. Sense of Inadequacy (T3)		.060	.369**	.540**	-	
	Sample Size	52	52	49		
5. Sense of Inadequacy (T4)		.229	.431**	.481**	.494**	-
	Sample Size	53	57	47	38	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

No significant correlations between group designation and Sense of Inadequacy were found.

Table 4. *Sense of Inadequacy and Dosage: Correlations (No Covariates)*

Variables		1	2	3	4	5
1. Intervention Dosage		-				
2. Sense of Inadequacy (T1)		-.214*	-			
	Sample Size	96				
3. Sense of Inadequacy (T2)		-.074	.325**	-		
	Sample Size	65	90			
4. Sense of Inadequacy (T3)		.033	.369**	.540**	-	
	Sample Size	31	52	49		
5. Sense of Inadequacy (T4)		-.030	.431**	.481**	.494**	-
	Sample Size	36	57	47	38	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Significant correlations between intervention dosage and Sense of Inadequacy at time point one (T1), $r = -.214$, $p = .036$. These results suggest that the higher a participant's level of Sense of Inadequacy was at the beginning of the school year, the more time they spent participating in the intervention the rest of the year.

Appendix E. Attitudes Towards School, Sense of Inadequacy, and Academic Grades Correlations (No Covariates)

Table 1. *Attitudes Towards School and Academic Grades: Correlations (No Covariates)*

Variables		1	2	3	4	5	6	7	8
1. Mathematics (T3)		-							
2. Science (T3)		.598**	-						
	Sample Size	191							
3. English (T3)		.700**	.684**	-					
	Sample Size	186	190						
4. Non-Core Subjects (T3)		.555**	.722**	.666**	-				
	Sample Size	191	195	190					
5. Attitudes Towards School (T1)		-.194	-.115	-.124	-.152	-			
	Sample Size	85	85	85	85				
6. Attitudes Towards School (T2)		-.179	-.108	-.114	-.249	.279**	-		
	Sample Size	55	55	55	55	91			
7. Attitudes Towards School (T3)		.073	-.089	-.173	-.016	.365**	.536**	-	
	Sample Size	35	35	35	35	52	49		
8. Attitudes Towards School (T4)		.012	-.179	.127	-.062	.214	.403**	.449**	-
	Sample Size	42	42	42	42	58	50	40	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

No significant correlations between any core academic grades and Attitudes Towards School were found.

Table 2. *Sense of Inadequacy and Academic Grades: Correlations (No Covariates)*

Variables		1	2	3	4	5	6	7	8
1. Mathematics (T3)		-							
2. Science (T3)		.598**	-						
	Sample Size	191							
3. English (T3)		.700**	.684**	-					
	Sample Size	186	190						
4. Non-Core Subjects (T3)		.555**	.722**	.666**	-				

	Sample Size	191	195	190				
5.	Sense of Inadequacy (T1)	-.306**	-.082	-.223*	-.181	-		
	Sample Size	85	85	85	85			
6.	Sense of Inadequacy (T2)	-.260*	-.065	-.068	-.247	.325**	-	
	Sample Size	55	55	55	55	90		
7.	Sense of Inadequacy (T3)	-.186	-.334*	-.402*	-.264	.369**	.540**	-
	Sample Size	35	35	35	35	52	49	
8.	Sense of Inadequacy (T4)	-.120	-.171	.027	-.076	.431**	.481**	.494**
	Sample Size	41	41	41	41	57	47	38

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Sense of Inadequacy at time point 1 (T1) was correlated with Mathematics [r = -.306, p = .004] and English [r = -.223, p = .040] grades at the end of the school year. Students reporting lower levels of inadequacy at baseline received higher grades in English and Mathematics. Sense of Inadequacy at time point 2 (T2) was also correlated with Mathematics grades [r = -.260, p = .055]. Students reporting lower levels of inadequacy in the middle of the school year received higher grades in Mathematics. Sense of Inadequacy at time point 3 (T3) was also correlated with Science [r = -.334, p = .050] and English grades [r = -.402, p = .017].

Appendix F. Linear Regressions Using Attitudes Towards School and Sense of Inadequacy to Predict Academic Grades (No Covariates)

Table 1. *Attitudes Towards School and Sense of Inadequacy Predicting Science Grades*

Variables	*F*	Unstandardized β	*p*	Adjusted R^2
Attitudes Towards School (T1)	1.121	-.020	.293	.001
Attitudes Towards School (T2)	.630	-.017	.431	-.007
Attitudes Towards School (T3)	.264	-.016	.611	-.022
Sense of Inadequacy (T1)	.561	-.013	.456	-.005
Sense of Inadequacy (T2)	.225	-.009	.637	-.015
Sense of Inadequacy (T3)	4.142	-.044	.050*	.085

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Sample Size (T1) = 85; Sample Size (T2) = 55; Sample Size (T3) = 35

Sense of Inadequacy at the end of year 1 (T3), did predict Science grades [$F(1,33) = 4.142$, $p = .050$ with an adjusted R^2 of .085] at the end of the year.

Table 2. *Attitudes Towards School and Sense of Inadequacy Predicting English Grades (No Covariates)*

Variables	*F*	Unstandardized β	*p*	Adjusted R^2
Attitudes Towards School (T1)	1.297	-.018	.258	.004
Attitudes Towards School (T2)	.695	-.013	.408	-.006
Attitudes Towards School (T3)	1.021	-.022	.320	.001
Sense of Inadequacy (T1)	4.335	-.028	.040*	.038
Sense of Inadequacy (T2)	.249	-.007	.620	-.014
Sense of Inadequacy (T3)	6.347	-.036	.017**	.136

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Sample Size (T1) = 85; Sample Size (T2) = 55; Sample Size (T3) = 35

Results also revealed that a baseline measure of Sense of Inadequacy (T1) predicted English grades [$F(1,83) = 4.335$, $p = .040$ with an adjusted R^2 of .038] at the

end of the year. Sense of Inadequacy at the end of year 1 (T3), also predicted English [$F(1,33) = 6.347$, $p = .017$ with an adjusted R^2 of .136] grades at the end of the school year.

Table 3. *Attitudes Towards School and Sense of Inadequacy Predicting Non-Core Subjects Grades (No Covariates)*

Variables	F	Unstandardized β	p	Adjusted R^2
Attitudes Towards School (T1)	1.952	-.024	.166	.011
Attitudes Towards School (T2)	3.502	-.036	.067	.044
Attitudes Towards School (T3)	.008	-.003	.929	-.030
Sense of Inadequacy (T1)	2.806	-.025	.098	.021
Sense of Inadequacy (T2)	3.456	-.031	.069	.044
Sense of Inadequacy (T3)	2.463	-.034	.126	.041

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Sample Size (T1) = 85; Sample Size (T2) = 55; Sample Size (T3) = 35

No significant findings emerged when conducting linear regressions with Non-Core Subjects grades and Attitudes Towards School and Sense of Inadequacy respectively.

Appendix G. Mediations with Intervention Dosage, Attitudes Towards School, Sense of Inadequacy and Academic Grades (No Covariates)

Table 1. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Science Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.000	-.0843, .2137	-	-	.9231/*.3559*
Path a	-.0012	35	-1.6908	.0998	-
Path b	-.0359	34	-1.2801	.2092	-
Path c	.0001	35	.7361	.4666	-
Path c'	.0000	34	.3624	.7193	-
Sense of Inadequacy (All)	.0000	-.0001, .0001	-	-	.0886/*.9294*
Path a	-.0004	35	-.4384	.6638	-
Path b	-.0056	34	-.2252	.8231	-
Path c	.0001	35	.7361	.4666	-
Path c'	-.0001	34	.7074	.4842	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 37

Neither Attitudes Towards School (95% CI = -.0843, .2137, z = .9231, *p* = .3559) nor Sense of Inadequacy (95% CI = -.0001, .0001, z = .0886, *p* = .9294) served as significant mediators of the relationship between intervention dosage and science grades.

Table 2. *ATS and SIN Mediates the Relationship Between Intervention Dosage and English Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0000	-.0001, .0001	-	-	.8085/*.4188*
Path a	-.0012	35	-1.6908	.0998	-
Path b	-.0275	34	-1.0695	.2924	-
Path c	.0000	35	.2000	.8427	-
Path c'	.0000	34	-.1012	.9200	-
Sense of Inadequacy (All)	.0000	-.0001, .0001	-	-	.2925/*.7699*

Path a	-.0004	35	-.4384	.6638	-
Path b	-.0217	34	-.9780	.3350	-
Path c	.0000	35	.2000	.8427	-
Path c'	.0000	34	.1270	.8997	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 37

Neither Attitudes Towards School (95% CI = -.0001, .0001, z = .8085, *p* = .4188) nor Sense of Inadequacy (95% CI = -.0001, .0001, z = .2925, *p* = .7699) served as significant mediators of the relationship between intervention dosage and English grades.

Table 3. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Mathematics Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0000	.0000, .0002	-	-	.8750/*.3816*
Path a	-.0012	35	-1.6908	.0998	-
Path b	-.0372	34	-1.1880	.2431	-
Path c	.0000	35	-.0224	.9823	-
Path c'	.0000	34	-.3481	.7299	-
Sense of Inadequacy (All)	.0000	-.0001, .0001	-	-	.3301/*.7413*
Path a	-.0004	35	-.4384	.6638	-
Path b	-.0336	34	-1.2491	.2202	-
Path c	.0000	35	-.0224	.9823	-
Path c'	.0000	34	-.1148	.9093	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 37

Neither Attitudes Towards School (95% CI = .0000, .00021, z = .8750, *p* = .3816) nor Sense of Inadequacy (95% CI = -.0001, .0001, z = .3301, *p* = .7413) served as significant mediators of the relationship between intervention dosage and mathematics

grades.

Table 4. *ATS and SIN Mediates the Relationship Between Intervention Dosage and Non-Core Subjects Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0000	.0000, .0002	-	-	-1.3837/*.1664*
Path a	-.0012	35	-1.6908	.0998	-
Path b	-.0589	34	-2.7976	.0084	-
Path c	.0001	35	.5685	.5733	-
Path c'	.0000	34	-.1712	.8651	-
Sense of Inadequacy (All)	.0000	-.0001, .0001	-	-	.3374/*.7358*
Path a	-.0004	35	-.4384	.6638	-
Path b	-.0258	34	-1.3154	.1972	-
Path c	.0001	35	.5685	.5733	-
Path c'	.0000	34	.4757	.6374	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 37

Neither Attitudes Towards School (95% CI = .0000, .0002, z = -1.3837, *p* = .1664) nor Sense of Inadequacy (95% CI = -.0001, .0001, z = .3374, *p* = .7358) served as significant mediators of the relationship between intervention dosage and Non-Core Subjects grades.

Appendix H. Mediations with Group Designation, Attitudes Towards School, Sense of Inadequacy and Academic Grades (No Covariates)

Table 1. *ATS and SIN Mediates the Relationship Between Group Designation and Science Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0105	-.0772, .1607	-	-	.2287/*.8191*
Path a	-.3481	76	-.2778	.7819	-
Path b	-.0300	75	-1.5053	.1365	-
Path c	.1048	76	.4770	.6347	-
Path c'	.0944	75	.4328	.6664	-
Sense of Inadequacy (All)	-.0193	-.1005, .0516	-	-	-.4781/*.6325*
Path a	1.1431	76	.7926	.4305	-
Path b	-.0169	75	-.9652	.3375	-
Path c	.1048	76	.4770	.6347	-
Path c'	.1241	75	.5622	.5757	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 78

Neither Attitudes Towards School (95% CI = -.0772, .1607, z = .2287, *p* =.8191) nor Sense of Inadequacy (95% CI = -.1005, .0516, z = -.4781, p = *.6325*) served as significant mediators of the relationship between group designation and science grades.

Table 2. *ATS and SIN Mediates the Relationship Between Group Designation and English Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0111	-.0846, .1498	-	-	.2449/*.8066*
Path a	-.3481	76	-.2778	.7819	-
Path b	-.0319	75	-1.9379	.0564*	-
Path c	-.0454	76	-.2475	.8052	-
Path c'	-.0565	75	-.3136	.7547	-
Sense of Inadequacy (All)	-.0322	-.1283, .0446	-	-	-.6650/*.5061*

Path a	1.1431	76	.7926	.4305	-
Path b	-.0282	75	-1.9676	.0528*	-
Path c	-.0454	76	-.2475	.8052	-
Path c'	-.0132	75	-.0730	.9420	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 78

Neither Attitudes Towards School (95% CI = -.0846, .1498, z = .2449, *p* =.8066) nor Sense of Inadequacy (95% CI = -.1283, .0446, z = -.6650, p = .5061) served as significant mediators of the relationship between group designation and English grades.

Table 3. *ATS and SIN Mediates the Relationship Between Group Designation and Mathematics (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0158	-.1046, .1774	-	-	.2487/.8036
Path a	-.3481	76	-.2778	.7819	-
Path b	-.0453	75	-2.0859	.0404*	-
Path c	-.1431	76	-.5899	.5570	-
Path c'	-.1589	75	-.6689	.5056	-
Sense of Inadequacy (All)	-.0602	-.1949, .0793	-	-	-.7236/*.4693*
Path a	1.1431	76	.7926	.4305	-
Path b	-.0527	75	-2.8549	.0056*	-
Path c	-.1431	76	-.5899	.5570	-
Path c'	-.0829	75	-.3560	.7228	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 78

Neither Attitudes Towards School (95% CI = -.1046, .1774, z = .2487, *p* = .8036) nor Sense of Inadequacy (95% CI = -.1949, .0793, z = -.7236, p = .4693) served as significant mediators of the relationship between group designation and mathematics

grades.

Table 4. *ATS and SIN Mediates the Relationship Between Group Designation and Non-Core Subjects Grades (No Covariates)*

Variables	*b*/ Indirect	*df*/ LLCI,ULCI	*t*	*p*	Sobel z and *p*
Attitudes Towards School (All)	.0141	-.0783, .1661	-	-	.2526/*.8006*
Path a	-.3481	76	-.2778	.7819	-
Path b	-.0405	75	-2.2659	.0263*	-
Path c	-.0771	76	-.3843	.7019	-
Path c'	-.0912	75	-.4665	.6422	-
Sense of Inadequacy (All)	-.0346	-.1288, .0456	-	-	-.6615/*.5083*
Path a	1.1431	76	.7926	.4305	-
Path b	-.0303	75	-1.9336	.0569*	-
Path c	-.0771	76	-.3843	.7019	-
Path c'	-.0424	75	-.2145	.8308	-

*. Relationship significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
Confidence Intervals at 95%
Sample Size = 78

Neither Attitudes Towards School (95% CI = -.0783, .1661, z = .2526, *p* = .8006) nor Sense of Inadequacy (95% CI = -.1288, .0456, z = -.6615, p = .5083) served as significant mediators of the relationship between group designation and Non-Core Subjects grades.

Appendix I. Associations Between Intervention and Mediators

Table 1. *Intervention Dosage, Attitudes Towards School, and Sense of Inadequacy*

Variables	1	2	3	4	5	6
1. Intervention Dosage	-					
Degrees of Freedom	-					
2. Group Designation	.686**					
Degrees of Freedom	130					
3. Sense of Inadequacy (T1)	-.214*	-.072				
Degrees of Freedom	96	118				
4. Sense of Inadequacy (T2)	-.074	-.154				
Degrees of Freedom	65	83				
5. Sense of Inadequacy (T3)	.033	.060				
Degrees of Freedom	31	52				
5. Sense of Inadequacy (T4)	-.030	.229				
Degrees of Freedom	36	53				
6. Attitudes Towards School (T1)	-.213*	-.033				
Degrees of Freedom	96	119				
7. Attitudes Towards School (T2)	-.008	.083				
Degrees of Freedom	65	84				
8. Attitudes Towards School (T3)	.046	.014				
Degrees of Freedom	31	52				
9. Attitudes Towards School (T4)	-.137	.129				
Degrees of Freedom	36	54				
10. Sense of Inadequacy (Mean T1-T3)	-.097	-.013				
Degrees of Freedom	96	118				
11. Attitudes Towards School (Mean T1-T3)	-.098	.022				
Degrees of Freedom	96	119				

*. Correlations are significant at the 0.05 level.

**. Correlations are significant at the 0.01 level.

Table 2. *Intervention Dosage, Attitudes Towards School, and Sense of Inadequacy w/Controls*

Variables	1	2	3	4	5	6
6. Intervention Dosage	-					
Degrees of Freedom	-					
7. Group Designation	.670	-				
Degrees of Freedom	116	-				
8. Sense of Inadequacy (T1)	-.160	-.027				
Degrees of Freedom	93	115				
9. Sense of Inadequacy (T2)	-.038	-.130				
Degrees of Freedom	62	80				
10. Sense of Inadequacy (T3)	.016	.048				
Degrees of Freedom	28	47				
5. Sense of Inadequacy (T4)	-.024	.239				
Degrees of Freedom	33	50				
7. Attitudes Towards School (T1)	-.177	.000				
Degrees of Freedom	93	116				
8. Attitudes Towards School (T2)	-.025	.073				
Degrees of Freedom	62	81				
9. Attitudes Towards School (T3)	.109	.058				
Degrees of Freedom	28	47				
10. Attitudes Towards School (T4)	-.120	.149				
Degrees of Freedom	33	51				
11. Sense of Inadequacy (Mean T1-T3)	-.054	.021				
Degrees of Freedom	93	115				
12. Attitudes Towards School (Mean T1-T3)	-.071	.045				
Degrees of Freedom	93	116				

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.
Control variable: age

Appendix J. Intervention Only Analysis

Descriptive Statistics and Covariates

Table 1. *Descriptive Statistics for Intervention Dosage for Intervention Group Only*

Variables	Sample Size	Mean	Std. Deviation
Intervention Dosage	58	1346.993	1071.499

Table 2. *Correlations between Intervention Dosage, Age and Gender for Intervention Group Only*

Variables		1	2	3
1. Intervention Dosage		-		
2. Age		.129	-	-
	N	53	-	-
3. Gender		.031	-	-
	N	58	-	-

*. Correlations are significant at the 0.05 level.
**. Correlations are significant at the 0.01 level.

Table 3. *Age, Gender and Sense of Inadequacy for Intervention Group Only*

Variables		1	2	3	4	5	6
1. Age		-					
2. Gender		.052	-				
	N	153					
3. Sense of Inadequacy (T2)		.185	-.072				
	N	77	84				
4. Sense of Inadequacy (T2)		-.014	.161	.286*	-		
	N	64	66	66			
5. Sense of Inadequacy (T3)		-.271	-.081	.331*	.627**	-	
	N	43	45	45	42		
6. Sense of Inadequacy (T4)		-.029	-.069	.456**	.618**	.482**	
	N	45	45	45	39	34	-

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 4. *Age, Gender and Attitudes Towards School for Intervention Group Only*

Variables		1	2	3	4	5	6
7. Age		-					
8. Gender		.052	-				
	N	153					
9. Attitudes Towards School (T1)		.159	-.167				
	N	78	85				
10. Attitudes Towards School (T2)		-.123	.059	.237			
	N	65	67	67			
11. Attitudes Towards School (T3)		.063	-.069	.335*	.555**		
	N	44	46	46	43	-	
12. Attitudes Towards School (T4)		.014	.028	.223	.430**	.457**	
	N	45	45	45	40	35	-

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 5. *Age, Gender and Academic Grades for Intervention Group Only*

Variables		1	2	3	4	5	6
13. Age		-					
14. Gender		.052	-				
	N	153					
15. Mathematics (T3)		-.044	.117				
	N	110	121				
16. Science (T3)		.264**	.147	.566			
	N	112	123	121			
17. English (T3)		.237*	.253**	.676**	.688**		
	N	111	122	120	122	-	
18. Non-Core Subjects (T3)		.221*	.295**	.553**	.745**	.684**	
	N	112	123	121	123	122	-

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis A: Correlations Between Intervention Dosage and Attitudes Towards School and Sense of Inadequacy

Table 5. *Sense of Inadequacy and Intervention Dosage for Intervention Group Only*

Variables	1	2	3	4	5

19. Intervention Dosage		-				
20. Sense of Inadequacy (T1)		-.306*	-			
	N	58				
21. Sense of Inadequacy (T2)		-.063	.286*	-		
	N	45	66			
22. Sense of Inadequacy (T3)		.065	.331*	.627**	-	
	N	24	45	42		
23. Sense of Inadequacy (T4)		-.185	.456**	.618**	.482**	-
	N	27	45	39	34	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 6. *Attitudes Towards School and Intervention Dosage for Intervention Group Only*

Variables		1	2	3	4	5
24. Intervention Dosage		-				
25. Attitudes Towards School (T1)		-.284*	-			
	N	58				
26. Attitudes Towards School (T2)		-.205	.237	-		
	N	45	67			
27. Attitudes Towards School (T3)		.057	.335*	.555**	-	
	N	25	46	43		
28. Attitudes Towards School (T4)		-.305	.223	.430**	.457**	-
	N	26	45	40	35	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Correlations Between Academic Grades and Attitudes Towards School and Sense of Inadequacy

Table 7. *Sense of Inadequacy and Academic Grades for Intervention Group Only*

Variables		1	2	3	4	5	6	7	8
1. Mathematics (T3)		-							
2. Science (T3)		.566**	-						
	N	121							
3. English (T3)		.676**	.688**	-					
	N	120	122						

4. Non-Core Subjects (T3)		.553**	.745**	.684**	-				
	N	121	123	122					
5. Sense of Inadequacy (T1)		-.334**	-.018	-.212	-.135	-			
	N	62	62	62	62				
6. Sense of Inadequacy (T2)		-.207	-.054	-.050	-.191	.286*	-		
	N	48	48	48	48	66			
7. Sense of Inadequacy (T3)		-.232	-.331	-.470**	-.315	.331*	.627**	-	
	N	33	33	33	33	45	42		
8. Sense of Inadequacy (T4)		-.183	-.270	.067	-.146	.456**	.618**	.482**	-
	N	35	35	35	35	45	39	34	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 8. *Attitudes Towards School and Academic Grades for Intervention Group Only*

Variables		1	2	3	4	5	6	7	8
1. Mathematics (T3)		-							
2. Science (T3)		.566**	-						
	N	121							
3. English (T3)		.676**	.688**	-					
	N	120	122						
4. Non-Core Subjects (T3)		.553**	.745**	.684**	-				
	N	121	123	122					
5. Attitudes Towards School (T1)		-.183	-.039	-.058	-.080	-			
	N	62	62	62	62				
6. Attitudes Towards School (T2)		-.197	-.169	-.196	-.279	. 237	-		
	N	48	48	48	48	67			
7. Attitudes Towards School (T3)		.050	-.080	-.206	-.041	.335*	.555**	-	
	N	33	33	33	33	46	43		
8. Attitudes Towards School (T4)		-.023	-.256	.056	-.120	.223	.430**	.457**	-
	N	35	35	35	35	45	40	35	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis C: Significant Regressions for Intervention Group Only

Table 2. *Sense of Inadequacy Predicting English, Math and Science Grades for Intervention Group Only*

Variables	*F*	Unstandardized β	*p*	Adjusted R^2
SIN (T3) and English	5.253	**-.054**	.006**	.298
SIN (T1) and Math	7.539	**-.053**	.008**	.097
SIN (T3) and Science	2.380	**-.055**	.043*	.084

*. Relationships are significant at the 0.05 level.
**. Relationships are significant at the 0.01 level.
For English analyses age and gender were used as covariates
For Science analyses age was used as a covariate