

THESIS

MECHANISMS OF GROWTH: SOCIAL-EMOTIONAL LEARNING AND THE PWRHRS
PROGRAM

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ABSTRACT

MECHANISMS OF GROWTH: SOCIAL-EMOTIONAL LEARNING AND THE PWRHRS PROGRAM

Recent public education reform initiatives have emphasized student academic achievement, primarily in reading and mathematics. To meet the pressure these initiatives present, a growing number of schools have chosen to implement social-emotional learning (SEL) curricula and instruction to promote academic development. PwrHrs (pronounced “power hours”) is an after-school initiative of YouthPower365, an organization, based in Avon, Colorado. PwrHrs seeks to enrich students’ academic and social-emotional competence through supplemental academic tutoring and intentional SEL instruction. Past evaluations of the PwrHrs program have demonstrated through single-group pretest-posttest designs that PwrHrs youth have exhibited increases in reading, mathematics, and social-emotional competency. The purpose of this study was to explore the effect of PwrHrs’ social-emotional learning components on gains in PwrHrs participants’ academic achievement. The study used a non-randomized control group comparison design including 567 participants enrolled in three area schools during the 2017-2018 school year. Pre-, mid-, and posttest data in reading and math, as well as math and reading report card grades, were examined for differences based on PwrHrs participation and amount of exposure to PwrHrs SEL instruction. Main program effects were examined using multiple regression, controlling for appropriate covariates. Results revealed a significant effect of PwrHrs SEL instruction on reading mid-test achievement; however, this was the only significant

effect found. Although few significant results were revealed, this study informs future directions for PwrHrs program design and implementation.

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INTRODUCTION

Recent public education reform initiatives such as No Child Left Behind (U.S. Department of Education, 2002), Race to the Top (Race to the Top, n.d.), and the Every Student Succeeds Act (Every Student Succeeds Act, n.d.) emphasize student academic achievement, primarily in reading and mathematics. These initiatives utilize testing outcomes to evaluate educator and school quality, which in turn affects federal dollar allocation. Thus, an increased emphasis on measurable academic achievement in mathematics and reading persists within public education. To meet the pressure testing initiatives present, a growing number of schools have chosen to implement social-emotional learning (SEL) curricula and instruction as it is hypothesized to promote academic development (Zins, Bloodworth, Weissberg, & Walberg, 2004). Both school-based and after-school SEL programs have been implemented in schools across the United States in order to capitalize upon SEL's potential to promote academic achievement.

PwrHrs (pronounced “power hours”) is an after-school initiative of a local organization, YouthPower365, based in Avon, Colorado. PwrHrs seeks to enrich students' academic and social-emotional competence through supplemental academic tutoring and intentional SEL instruction. PwrHrs utilizes five core social-emotional ‘values’ to drive SEL curriculum design: Perseverance, Ownership, Wellness, Empowerment, and Respect.

Past evaluations of the PwrHrs program have provided insight into how the program is associated with social-emotional and academic achievement, demonstrating through single-group pretest-posttest designs that PwrHrs youth increase reading, mathematics, and social-emotional competency (“PwrHrs Evaluation Comparison”, 2017). Given these promising findings,

YouthPower365 partnered with the Department of Human Development and Family Studies at Colorado State University to conduct a more rigorous evaluation exploring specific mechanisms related to academic gains through the use of a non-randomized control group comparison.

The following study is a secondary data analysis that examined the overall effect of the PwrHrs program on participant reading and mathematics achievement through a non-randomized control group comparison design. Additionally, using this same design, the study also sought to investigate the relationship between dosage of PwrHrs SEL instruction and academic outcomes in reading and math. The following research questions were used to guide the study:

1. Does participation in the PwrHrs after-school program contribute to growth in reading and mathematics achievement?
2. Does increased exposure to PwrHrs SEL lessons improve reading and mathematics achievement growth?

The study will contribute to the current understanding of how PwrHrs SEL curriculum influences participants' academic achievement. This understanding will, in turn, contribute to future PwrHrs program design and implementation adaptations. To set a foundation for the study, the following comprehensive literature review will discuss SEL, benefits associated with SEL instruction, strategies used to implement SEL instruction, and the PwrHrs program.

LITERATURE REVIEW

Social-emotional learning (SEL) is the process by which individuals acquire and apply information, skills, and attitudes to effectively manage and understand emotional states, create and complete personal goals, build and maintain positive relationships, and make responsible choices (Collaborative for Academic, Social, and Emotional Learning, n.d.). Social-emotional learning begins at birth (Tronick, 2007; Grossmann, 2015) and is necessary for functionality and healthy development throughout the lifespan (Nelson, Furtado, Fox, & Zeanah, 2009). While there is vast body of literature regarding social and emotional development during the early years of childhood, SEL will henceforth be considered through the lens of educational programming and academic achievement in order to align with the current study's focus.

Students often begin engagement with SEL programs upon entering school in accordance with state content standards, which vary by state. For example, Kindergarten standard three in the content area of Comprehensive Health and Physical education requires that Kindergarten children in the state of Colorado must exhibit an understanding of impacts their actions have on others by demonstrating actions that show care and consideration for others, describing the importance of respecting personal boundaries, and explaining that emotions influence actions (Colorado Department of Education, 2018). Currently, fourteen states have SEL content standards (Collaborative for Academic, Social, and Emotional Learning, 2018) aimed at promoting student social-emotional competence.

Social-emotional competence can be learned in a variety of ways. Notably, Zins and colleagues emphasize that “engaging students actively and experientially in the [social-emotional] learning process can be highly beneficial” as the “best SEL approaches encourage

application of SEL competencies to real-life situations” (Zins et al., 2004, p. 12). This form of hands-on SEL learning couples with the inherent social nature of schooling, providing students space for application and experimentation.

SEL: A Theoretical Context of Change

The Research and Guidelines Committee of the Collaborative for Academic, Social, and Emotional Learning (CASEL) states that SEL includes character development and targets mechanisms that develop healthy behaviors and attitudes for social, emotional, academic, and physical health (Axelrod, 2010; Elias et al., 1997). A core goal of SEL, as summarized by Osher and colleagues (2016, p. 646), is to nurture the five interdependent sets of social-emotional competencies found in Table 1.

Table 1
CASEL Competencies and Respective Operational Definitions

CASEL Competency	Operational Definition
Self-Awareness	The ability to recognize one’s own emotions and values, to accurately assess weaknesses and strengths, and to possess a well-grounded sense of self-efficacy and optimism.
Self-Management	The ability to regulate emotions, thoughts, and behaviors in diverse situations, including the ability to manage stress, control impulses, and set and achieve goals.
Social Awareness	The ability to adopt the perspective of those with different backgrounds, understanding social and cultural norms, and recognizing available resources and supports.
Relationship Skills	The ability to establish positive relationships with different kinds of people, communicating clearly, listening actively, cooperating, resisting inappropriate peer pressure, negotiating conflict, and seeking help when necessary.
Responsible Decision Making	The capacity to make choices based on realistic evaluations of consequences, well-being, ethics, safety, and social norms.

Note. CASEL competencies and operational definitions from Osher and colleagues (2016).

SEL promotes academic achievement through student competency with these five skills, as prosocial behaviors are associated with positive intellectual outcomes (Davies & Cooper, 2013; Zins et al., 2004). Each aforementioned competency can be linked to tasks and choices that lead to academic, social, and emotional well-being. For example, individuals competent in self-management are better at controlling classroom behavior (e.g., during ‘circle time’ or testing). Similarly, those competent in decision-making are likely better able to make decisions regarding academic tasks to meet a specific outcome, such as choosing to complete homework as opposed to engaging in alternate activities. In short, social-emotional competency is the working mechanism that bridges the gap between SEL instruction and academic outcomes.

Benefits of SEL

Youth focused programs, including those implemented in schools and during out-of-school time (e.g., after-school programs) have been shown to benefit from SEL instruction. For example, in a meta-analysis of 213 school-based SEL programs, Durlak and colleagues reported that students who received social-emotional learning intervention exhibited lower levels of emotional distress and conduct problems, as well as improved SEL skills, prosocial behaviors, and academic performance when compared to students who did not receive social-emotional intervention measures (Durlak et al., 2011). Additional examples of specific SEL programs that are associated with improved academic achievement can be found in Table 2.

Table 2
Evidence-based SEL Programs and Evaluation Outcomes

Program Name	Evaluation Outcomes
Caring School Community	Improved academic performance, positive social behavior, and academic behavior. Reduced conduct issues and emotional distress.
Promoting Alternative Thinking Strategies (PATHS)	Improved academic performance, positive social behavior, and academic behavior. Reduced conduct issues and emotional distress.
4Rs Program (Reading, Writing, Respect, and Resolution)	Improved academic performance and academic behaviors for students at behavioral risk, positive social behavior, and social and emotional competency performance. Reduced conduct issues and emotional distress.
Positive Action	Improved academic performance, academic behaviors, and substance abuse prevention. Reduced conduct issues.

Note. Program names and evaluation outcomes from the Collaborative for Academic, Social, and Emotional Learning (2012).

Given the previously mentioned pressure of academic achievement outcomes, the inclusion of SEL competencies in state content standards indicates the importance of the association between SEL and academic achievement. The association between SEL and academic outcomes has been confirmed multiple times throughout field literature (see Ashdown & Bernard, 2012; Cohen, 2006; Denham & Brown, 2010; Malecki & Elliot, 2002). SEL curriculum and instruction has been linked with growth in academic outcomes (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Greenberg et al., 2003; Ragozzino, Resnik, Utne-O'Brien, & Weissberg, 2003).

Social-emotional skills gained through SEL instruction have also been linked with positive prosocial behaviors such as greater well-being and healthy relationships with others

(Davies & Cooper, 2013; Ladd, Kochenderfer, & Coleman, 1996) Additionally, SEL instruction has been found to reduce comorbid behaviors that threaten academic success, such as violence (Hawkins et al., 1998), drug and alcohol use, school dropout rates, and other conduct issues (Wilson, Gottfredson, & Najaka, 2001).

SEL During the Traditional School Day

As discussed previously, SEL curriculum and instruction can be implemented during the school day in accordance with mandated state content standards; however, there are several other strategies that may be utilized for the purpose of promoting SEL during the traditional school day. First, schools can choose to implement SEL curricula or programs. Many programs and curricula have been designed for school day use, including the Getting Along Together, Competent Kids, Caring Communities, and Resolving Conflict Creatively programs (Collaborative for Academic, Social, and Emotional Learning, 2012). Often, these programs include explicit social-emotional skills instruction, opportunities to practice skills, and integration in academic instruction.

The second strategy is to promote a richer social-emotional school climate based on school strengths and needs. For instance, schools looking to enhance student character development can attempt to implement programs such as Building Schools of Character, MOSAIC (Mastering Our Skills and Inspiring Character), and Social and Emotional Character Development (Carson et al., 2018). Other schools striving to improve school climate through classroom management can select and implement The Responsive Classroom, Growing a Nurturing Classroom, and Insights programs (Carson et al., 2018).

SEL During Out-of-School Hours

Like traditional classrooms, after-school programs are considered one of many ideal spaces for social and emotional learning to take place, given their social nature (Zins et al., 2004). Typically, after-school programs often include a combination of academic assistance, recreation, and physical education and provide service to a broad range of students (Bouffard & Little, 2003). Several differences exist between SEL instruction implemented during the traditional school day and after-school hours. Given that attendance to programming out-of-school hours is not mandated, the population of after-school programs are fundamentally different from that of traditional school day. Students are required to be selected or self-select into program participation and this selection bias can make it difficult to separate program effects from personal qualities that prompted students to participate in the program (Hurd & Deutch, 2019). Additionally, while traditional school day SEL instruction is often implemented by a licensed educator within the classroom setting, after-school programs are typically led by individuals with less formal training, potentially resulting in higher turnover (Frazier, Cappella, & Atkins, 2007; Hurd & Deutch, 2019).

While there is less evidence of the effectiveness of specific after-school SEL programs, field literature indicates positive outcomes for youth who participate in after-school programs. High-quality after-school programs are associated with many positive social and academic developmental outcomes by providing educational opportunities in safe, adult supervised environments (Durlak & Weissberg, 2007). For example, participation in after-school programs has been associated with improvements in youth self-confidence, self-esteem, positive social behaviors, and academic achievement, as well as reductions in problem behaviors and drug use (Durlak and Weissberg, 2007). Conversely, unsupervised after school time is linked to risky

behavior, such as drug use (Atherton, Schofield, Sitka, Conger, & Robins, 2016; Wilson, Gottfredson, & Najaka, 2001).

The PwrHrs After-School Program

One example of a potentially effective after-school program is the PwrHrs (pronounced “power hours”) program, an initiative of a local organization, YouthPower365, based in Avon, Colorado. PwrHrs is implemented in the Vail Valley School District in Eagle County, Colorado, an area uniquely characterized by financial disparity and cultural richness. The county median household income is \$78,763, compared to \$57,617 statewide (“Quick Facts: Eagle County, Colorado”, 2016). However, the cost of living in the area is more than three times the national self-sufficiency standard at \$51,641 for a single parent and toddler family model (Colorado Center on Law and Policy, 2015). Thus, the area is one of great disparity, having large impacts on families in low-income jobs. Moreover, 63% of PwrHrs students are eligible for the federal Free and Reduced Lunch program as of 2016 – 2017 program data (“PwrHrs Evaluation Comparison”, 2017). Additionally, 34.6% of students in the area are English Language Learners, compared to 14.2% of students nationwide (Corn & Snider, 2017). 51.5% of students in the area are of Hispanic descent (Corn & Snider, 2017), with 68% of PwrHrs participants being English Language Learners in the 2016 – 2017 school year (“PwrHrs Evaluation Comparison”, 2017).

Within this community context, PwrHrs seeks to fulfill its mission to “empower Eagle County youth to achieve their greatest potential through engaging academic and enrichment out-of-school time opportunities” (Corn & Snider, 2017, p. 6) by providing academic support through homework help, project-based learning, and academic interventions. Additionally, the program provides specific SEL curricula in an effort to improve student wellness and SE competency.

PwrHrs is both high quality and potentially effective. The program’s quality is not only verified using a valid and reliable measure, but evident through observable parallels between its program mission and established characteristics of effective SEL programming posited by Zins and Elias (2007). To illustrate, PwrHrs’ program vision and philosophy statements are linked with characteristics of effective SEL programming in Table 3.

Table 3
PwrHrs Values and Philosophy Statements and Linked Characteristics of Effective SEL Programming

PwrHrs Statement	Characteristic of Effective SEL Programming
“The program is designed to support academic growth and 21 st century learning skills, promote character development and social-emotional skill-building, provide a safe and nurturing environment during out-of-school time, and increase family engagement in their child’s education.” ^a	Based on theory and research and carefully planned
“Out-of-school extended learning programs enhance school-day curriculum.” “Project-based learning teaches innovation, ownership, and practical application skills that place students on the path to gainful employment.”	Interactively teaches SEL skills for applications to daily life
“Instructors are caring, nurturing, and responsive to individual student needs.”	Builds connections to school through caring, engaging classroom and school practices
“Programming supports the needs of the whole child and family unit.” “Program is inclusive – affordable, and offered in a bi-lingual setting.”	Promotes developmentally and culturally appropriate instruction
“Out-of-school extended learning programs enhance school-day curriculum.” “Parental engagement supports holistic learning and growth in students.” “Project-based learning teaches innovation, ownership, and practical application skills that place students on the path to gainful employment.”	Leads to coordinated, integrated, and unified programming linked to academic outcomes

“Project-based learning teaches innovation, ownership, and practical application skills that place students on the path to gainful employment.”	Enhances school performance by addressing emotional and social dimensions of learning by engaging and interactive methods
“Eagle County Schools, nonprofits, businesses and families working together to create well-informed, self-sufficient families and educated students who are prepared to seize post-secondary opportunities and obtain gainful employment.” “Parental engagement supports holistic learning and growth in students.”	Involves school–family–community partnerships
“Eagle County Schools, nonprofits, businesses and families working together to create well-informed, self-sufficient families and educated students who are prepared to seize post-secondary opportunities and obtain gainful employment.”	Establishes organizational supports and policies that foster success
“Instructors are caring, nurturing, and responsive to individual student needs.”	Provides high-quality staff development and support
“Programmatic revisions utilize input from youth and families we serve.”	Addresses key implementation and sustainability factors, including continuous improvement, outcomes evaluation, and dissemination factors

Note. PwrHrs statements from Corn & Snider (2017). Characteristics of effective SEL programming from Zins & Elias (2007).

^aThe indicated statement does not appear in the PwrHrs mission or philosophy statements. Rather, the statement is quoted from the “Program Need” section of the PwrHrs Program Manual (Corn & Snider, 2017).

Further, PwrHrs’ design and implementation quality is also aligned with PwrHrs’ core SEL values of instruction and the previously mentioned CASEL competencies. The PwrHrs’ SEL instruction curriculum is delivered through the enrichment component of the program and is framed around specific “Power Values”, or social-emotional principles selected by YouthPower365 staff. The PwrHrs Power Values are presented, defined, and linked to CASEL competencies in Table 4.

Table 4

Definition of PwrHrs Power Values and Observable Links to CASEL Competencies

Power Value	Definition	Linked CASEL Competency
Perseverance	“The quality that motivates someone to continue doing something even though it is difficult.”	Self-Awareness Self-Management
Ownership	“An attitude of accepting responsibility for something and taking control of how it develops.”	Self-Awareness Self-Management
Wellness	“Encompassing physical, mental and emotional health, usually including a healthy way of living.”	Responsible Decision Making
Empowerment	“An attitude that provides support and resources to enable greater control and confidence in individuals’ abilities to manage their lives and their power to accomplish their goals.”	Self-Awareness Self-Management Responsible Decision Making
Respect	“A feeling of admiration that you have for someone because of their personal qualities, their achievements, or their status, and that you show by treating them in a polite, kind way.”	Social Awareness Relationship Skills

Note. Power values and definitions from Corn & Snider (2017). CASEL competencies from Osher and colleagues (2016).

These “Power Values” are instructed through a variety of activities within the PwrHrs program as decided by PwrHrs staff. For example, the core value of “Ownership” can be taught to students through a physical activity, such as a traditional game of “Tag”. Program staff may choose to introduce the core value, “Ownership”, to students during a group time prior to the game. After introducing the core concept of the lesson, students may play “Tag” with the understanding that they are responsible for tagging others – that is, that they have ownership of their hands’ actions. To end the lesson, program staff may choose to debrief with students and tie their experiences during the game to the core concept. There is no set PwrHrs SEL curriculum; however, lessons like this and many others are used during program hours. Notably, PwrHrs SEL instruction is not limited to physical education; rather, lessons may be infused with art, music, reading, math, and other subjects offered by the school.

Past evaluations of the program have given insight into how it is associated with social-emotional competency and academic achievement, revealing associations with growth in reading, mathematics, and social-emotional competency (“PwrHrs Evaluation Comparison”, 2017). In a single group, pretest-posttest evaluation design, conducted during the 2016 – 2017 school year, 95% of elementary PwrHrs participants exhibited growth in reading pre- and post-assessments (“PwrHrs Evaluation Comparison”, 2017). 92% of PwrHrs participants at the elementary level showed positive change in mathematics scores from pre- to post-assessment in the same year (“PwrHrs Evaluation Comparison”, 2017). Similarly, 78% of elementary PwrHrs students responded positively to social-emotional measurements, indicating positive social-emotional wellbeing (“PwrHrs Evaluation Comparison”, 2017). Notably, this evaluation did possess a design limitation in that there was no comparison group. Possible threats to internal validity inherent with this experimental design include maturation, history, and repeat testing effects.

Given these promising findings, YouthPower365 partnered with the Department of Human Development and Family Studies at Colorado State University to conduct a more rigorous evaluation to explore specific mechanisms related to academic gains through control group comparisons. The following study seeks deeper exploration into the social-emotional program components potentially responsible for gains in reading and mathematics scores in the PwrHrs program.

CURRENT STUDY

The purpose of the current study was to examine the overall effect of the PwrHrs program on participant reading and mathematics achievement through non-randomized control group comparison design. Additionally, using this same design, the study also sought to investigate the relationship between dosage of PwrHrs SEL instruction and academic outcomes in reading and math. Information gained through this study is aimed to contribute to PwrHrs program design and implementation. Given established empirical associations between SEL and academic performance, as well as preliminary PwrHrs program analyses results, the following research questions are proposed:

Research Question 1. Does participation in the PwrHrs after-school program contribute to growth in reading and mathematics achievement?

Research Question 2. Does increased exposure to PwrHrs SEL lessons improve reading and mathematics achievement growth?

The study was guided by the following hypothesis:

Hypothesis 1. Compared to non-PwrHrs youth, PwrHrs participants will demonstrate significantly higher performance in reading and math achievement and report card grades.

Hypothesis 2. Greater exposure to PwrHrs SEL instruction will be positively associated with higher performance in reading and math achievement and report card grades.

METHODS

Participants

Study participants were recruited from the following schools within the Vail Valley School District, based in Eagle County, Colorado: Avon Elementary, Gypsum Elementary, and June Creek Elementary. These sites were chosen for the study as each displayed a high level of staff acceptance towards the PwrHrs program and study. Additionally, the sites reflected the general demographics of the served student population and operated most effectively. Study participants consisted of students from first to fifth grade. With regards to school day attendance, four outliers were excluded from analysis based on having school day attendance rates below sixty-five days. Two additional participants were excluded due to incomplete participant records. After these exclusions, a total of 567 participants were used in the current study.

Study participants were composed of two groups: intervention and control. Group membership was based on participant enrollment into the PwrHrs program. The intervention group ($N = 320$) comprised of those who participated in the PwrHrs afterschool program during the 2017-2018 academic year. Participants were selected into the PwrHrs program through referred enrollment by school personnel and parent enrollment. Biological sex of the intervention group was 44.7% female ($n = 143$) and 55.3% male ($n = 177$). This group was not nationally representative in terms of ethnicity, as the group included approximately 86.3% Hispanic/Latinx participants ($n = 276$) vs. a national average of 24.4% (U.S. Census Bureau, 2016). There were fewer Whites/Caucasian and Black/African American participants than national averages (9.1% vs. 67.6% for Caucasians and 1.6% vs. 14.1% for African Americans). This group was not nationally representative in regard to number of English Language Learner (ELL) students ($n =$

229), with 71.6% of intervention group participants indicated as ELL students vs. a national average of 9.5% (National Center for Education Statistics, 2018). Intervention group demographic information is displayed in Table 5.

A comparison group was included within the original study design. In addressing the current study's first research question, data from this group will be utilized as a comparison to assess the effect of the PwrHrs program. The comparison group ($N = 247$) consisted of students that did not participate in PwrHrs program activities during the 2017-2018 academic year. Biological sex of the control group was 53.0% female ($n = 131$) and 47.0% male ($n = 116$). Like the intervention group, the control group did not reflect the majority of national averages in regard to ethnicity, as it included 79.8% ($n = 197$) Hispanic/Latinx participants vs. a national average of 24.4% (U.S. Census Bureau, 2016). The group also did not include any Asian or African American participants and included fewer Whites/Caucasian participants than national averages (18.6% vs. 67.6%). This group was also not nationally representative in regard to number of English Language Learner (ELL) students ($n = 153$), with 61.9% of intervention group participants indicated as ELL students vs. a national average of 9.5% (National Center for Education Statistics, 2018). Control group demographic information is displayed in Table 5.

An independent samples t-test was conducted to compare biological sex, race/ethnicity, and ELL status in the control and intervention groups. There was a small significant difference in gender composition for the control groups; $t(565) = -1.98, p = .049$, with a higher number of males in the intervention group. Additionally, a significant difference in race/ethnicity composition for the control groups; $t(549.60) = 2.10, p = .04$, with a higher number of White/Caucasian participants in the control group. Lastly, there was a significant difference in

the number of ELL participants in the control groups; $t(508.70) = -2.41, p = .02$, with a higher number of ELL participants in the intervention group.

Table 5

Demographic Characteristics of Study Participants, First Through Fourth Grades

Characteristic	Intervention Group (<i>N</i> = 320) <i>n</i> (%)	Control Group (<i>N</i> = 247) <i>n</i> (%)
Grade		
1	53 (16.6%)	32 (13%)
2	65 (20.3%)	52 (21.1%)
3	66 (20.6%)	52 (21.1%)
4	73 (22.8%)	42 (17%)
5	63 (19.7%)	69 (27.9%)
Sex		
Female	143 (44.7%)	131 (53%)
Male	177 (55.3%)	116 (47%)
Race/Ethnicity		
American Indian/Alaskan Native	5 (1.6%)	3 (1.2%)
Asian	1 (0.3%)	0 (0%)
Black or African American	5 (1.6%)	0 (0%)
Hispanic/Latinx	276 (86.3%)	197 (79.8%)
White	29 (9.1%)	46 (18.6%)
More than one race	4 (1.3%)	1 (0.4%)
English Language Learning		
ELL Students	229 (71.6%)	153 (61.9%)
Non-ELL Students	91 (28.4%)	94 (38.1%)

Procedures

Sampling Procedures.

The current study's sample originates from a third-party evaluation conducted by Colorado State University. Parents of study participants gave informed consent to YouthPower365 to obtain youth data. Informed consent and child assent were not necessary for the current study because CSU project staff were third-party evaluators who only received deidentified data that were already being collected by PwrHrs staff.

Program Procedures.

PwrHrs program activities occur during after-school hours throughout the regular school year. Activities take place at each school site within the district, and transportation is provided to ensure all students return home after daily program implementation. Daily program activities are implemented by certified educators and discipline-specific paraprofessionals for 90 minutes a day, three to four days a week in accordance with school scheduling (i.e. holiday breaks). The 90 minutes of program implementation is split between academic and enrichment activities, each for 45 minutes per day. SEL instruction, based on the five core POWER principles, takes place during the enrichment portion of daily programming. Academic and enrichment curricula components were determined by PwrHrs staff, and referrals from staff were accepted, but not necessary for student enrollment into the program.

Measures and Data Collection.

Demographic and school data.

Participant demographic information, including biological sex, ethnicity, ELL, and household income, was obtained from parents through an intake form.

Reading achievement.

PwrHrs students completed pre, mid, and post-assessments in reading and math. The proposed study will utilize pretest data collected in August of the fall 2017 semester and posttest data collected in April of the spring 2018 semester. Assessment scores were recorded in the YouthPower365 CSU Evaluation 2017-2018 data pool. Pretests were administered prior to participant enrollment into the study, indicating achievement level before receiving any services.

Reading achievement was measured using DIBELS (Dynamic Indicators of Base Early Literacy Skills) Curriculum-Based Measurement of Oral Reading Fluency (CBM ORF). A

DIBELS score is used to indicate current reading ability and predict future reading proficiency through the assessment of phonemic awareness, accuracy and fluency of text, vocabulary, reading comprehension, and alphabetic principle (Good & Kaminski, 2002). The DIBELS assessment consists of a student reading a text of grade appropriate reading level for one minute. Words omitted, substituted, and hesitations of more than three seconds are recorded as errors, whereas words self-corrected within three seconds are scored as accurate.

Students are given this assessment three times during the school year: beginning, middle, and end. The median number of correct words read aloud per minute from the three assessments is used as the DIBELS CBM ORF score, indicating oral reading fluency rate. The DIBELS tool has been found to be a valid and reliable measure (Good et al., 2004).

Math achievement.

Mathematic achievement was measured at pre-, mid-, and posttest using AIMSweb Math Computation (M-Comp). An M-Comp score is used to detect students at risk for math difficulties and universal screenings and assesses individual student growth at three ‘benchmark’ times in the school year: Fall, Winter, and Spring (NCS Pearson Inc., 2010). Each assessment at these benchmarks measures student number sense and computation according to grade level. The assessment is timed at eight minutes and is given on paper. Staff qualified to proctor the M-Comp facilitate and score the assessment. The assessment questions are different in each of the three benchmark assessments, but equal in difficulty as intentionally designed (NCS Pearson Inc., 2010). The tool is both valid and reliable, with reliability coefficients ranging from .82 to .90 across first through eighth grade (Anselmo, 2015).

Reading and math report card grades.

Reading and math report card grades were used as a measurement of reading and math achievement. The grades were issued two times within the school year: first on January 12, 2018, then on May 31, 2018 (Eberts, n.d.). Reading and math report card grades given on January 12, 2018 are henceforth referred to as “reading/math report card grades at Time 1”. Similarly, reading and math report card grades given on May 31, 2018 will be henceforth referred to as “reading/math report card grades at Time 2”. Report card grades reflect student performance on grade-level standards in accordance with Colorado Academic Standards (Eberts, n.d.). Colorado Academic Standards are used to describe expectations of learning for students by grade-level. Report card grades are reported as a value between 1-4, including half-point values. Each value reflects a performance level, with 1 representing “Unsatisfactory”, 2 representing “Partially Proficient”, 3 representing “Proficient”, and 4 representing “Advanced” (Eberts, n.d.).

PwrHrs SEL Exposure.

Exposure to PwrHrs SEL instruction was measured using the total number of days a participant attended the PwrHrs enrichment component in the fall and spring semesters of the 2017 – 2018 school year. This enrichment time focused on the PwrHrs social-emotional constructs of Perseverance, Ownership, Wellness, Empowerment, and Respect, and is the designated time for PwrHrs SEL instruction. The total number of days a student has attended PwrHrs SEL curriculum sessions will serve as the indicator for exposure to PwrHrs Afterschool enrichment curriculum, and one day indicates a 45-minute dosage of SEL instruction. Attendance was taken at each school site by PwrHrs staff.

ANALYSIS PLAN

Main effects

Research Question 1.

Multiple regression analyses were performed to examine the effect of PwrHrs participation on students' reading and math achievement and report card grades, controlling for appropriate covariates. Data from both intervention and control groups were utilized in order to observe differences between subjects from both groups. The independent variable in these analyses were treatment condition (i.e. PwrHrs participation vs. control), and the dependent variables were mid-test reading achievement, posttest reading achievement, reading report card grades at Time 1, reading report card grades at Time 2, mid-test math achievement, posttest math achievement, math report card grades at Time 1, and math report card grades at Time 2. Eight separate multiple regression analyses were performed; one to address each dependent variable. Models illustrating these analyses can be found in Figures 1 and 2.

Research Question 2.

Multiple regression analyses were performed to examine the effect of exposure to PwrHrs SEL instruction on students' reading and math achievement and report card grades, controlling for appropriate covariates. Data from only the intervention group was used in order to observe differences within the group. The independent variable in these analyses was exposure to PwrHrs SEL instruction. The dependent variables were mid-test reading achievement, posttest reading achievement, reading report card grades at Time 1, reading report card grades at Time 2, mid-test math achievement, posttest math achievement, math report card grades at Time 1, and math report card grades at Time 2. Eight separate multiple regression analyses were performed; one to

address each dependent variable. Models illustrating these analyses can be found in Figures 3 and 4.

Preliminary Analyses

Distributions of all outcome variables were examined for outliers, normality, and missing data. Missing values analyses revealed 10 variables with missing data. To assess if the items were missing at random, a Little's Missing Completely at Random (MCAR) Test was performed, which yielded a significant result, $X^2 = 682.82$, $DF = 214$, $p < .001$. Thus, the items were determined to be not missing at random.

Notably, math posttest achievement was found to be missing 134 items, 23.6% of the total items within the variable. Upon further inspection, 132 of these missing items were found in cases in which participants were enrolled in grade 5, regardless of school site. Additionally, math mid-test achievement was missing 250 items, 44.1% of the total items within the variable. Of these missing items, 115 were found in cases in which participants were enrolled in grade 4, while 132 were found in cases in which participants were enrolled in grade 5, regardless of school site. In light of this information, participants that were enrolled in grade 5 will not be included in math mid - and posttest achievement main effects analyses. Similarly, participants that were enrolled in grade 4 will not be included in math mid-test achievement main effects analyses.

Multiple imputation was used to address missing data. This technique replaces missing data while retaining sampling variability. Multiple imputation makes no assumptions about whether data are randomly missing (Tabachnik & Fidell, 2001), making it a practical option for managing missing data in the current study.

In regard to normality, outliers, and linearity, Tabachnick & Fidell (2001, p. 75) state the following: “If you are going to perform multiple regression.... An alternative to screening variables prior to analysis [for normality] is conducting the analysis and then screening the residuals.” Thus, normality and linearity amongst residuals were visually inspected during regression analyses (see Tabachnick & Fidell, 2001). No outcome variables were highly skewed, kurtotic, or had any outliers.

Table 6 illustrates mean scores, standard deviations, and correlational analyses for all continuous variables within the current study. Reading and math pretests were significantly correlated with one another, as well as to reading and math mid-tests and posttests. Similarly, reading and math mid-tests were significantly correlated with reading and math posttests. Both reading and math posttests were significantly correlated each other, ($r = .15, p < .001$). The strongest correlations existed between reading pre-, mid-, and posttest achievement. The correlation between reading pre- and mid-test achievement was positive, strong, and statistically significant ($r = .94, p < .001$). Similarly, the correlation between reading pre- and posttest achievement was positive, strong, and statistically significant ($r = .91, p < .001$). Finally, the correlation between reading mid- and posttest achievement was positive, strong, and statistically significant ($r = .94, p < .001$). No significant correlations were found between PwrHrs SEL exposure and reading pre-, mid-, and posttest data, including report card grades at Time 1 and two; however, a small, positive association was found between PwrHrs SEL exposure and school day attendance ($r = .23, p < .001$).

Table 6
Descriptive Statistics and Correlations Among All Continuous Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Reading Pretest Achievement	211.60	130.28	1												
2. Reading Mid-test Achievement	263.53	136.65	.94**	1											
3. Reading Posttest Achievement	314.18	144.80	.91**	.94**	1										
4. Reading Report Card Grades at T1	2.41	.83	.59**	.64**	.60**	1									
5. Reading Report Card Grades at T2	2.73	.83	.63**	.67**	.66**	.81**	1								
6. Math Pretest Achievement	17.51	4.65	.23**	.27**	.26**	.42**	.38**	1							
7. Math Mid-test Achievement	22.62	7.42	-.12	-.11	-.13	.27**	.26**	.54**	1						
8. Math Posttest Achievement	26.39	8.13	.17**	.17**	.15**	.40**	.42**	.50**	.74**	1					
9. Math Report Card Grades at T1	2.44	.64	.44**	.47**	.44**	.62**	.64**	.56**	.50**	.57**	1				
10. Math Report Card Grades at T2	2.63	.63	.36**	.43**	.39**	.59**	.75**	.55**	.48**	.58**	.75**	1			
11. Grade Level	3.16	1.39	.59**	.58**	.61**	.03	.09*	-.21**	-.46**	-.19**	-.04	-.11*	1		
12. School Day Attendance	160.75	6.95	.1*	.12**	.12**	.17**	.16**	.07	.07	.12**	.16**	.19**	.03	1	
13. PwrHrs SEL Exposure	47.32	10.23	.00	.05	-.01	.08	.01	.04	.06	.06	.06	.09	-.09	.23**	1

Note. * $p < .05$; ** $p < .01$

Correlational analyses were conducted between possible covariates and outcome variables to determine which covariates to include in main effects analyses. According to field literature, possible covariates include household income, gender, ethnicity, and English Language Learner status (Longworth-Reed, 2017). Reading and math pretest scores will be included as covariates given maturation and repeat testing effects. Other possible covariates include school day attendance, and grade level. Results indicate that all aforementioned possible covariates were associated with at least one or more variables; therefore, all were included in main effects analyses.

RESULTS

Research Question 1

The order of entry into each of the regression models was as follows. First, the effect of covariates was examined. Covariates included school day attendance, grade level, household income, gender, ethnicity/race, and English Language Learner status. In the second step, the effect of pretest data was tested, and in the final step, the effect of PwrHrs participation was examined. Overall, no significant main effects were found. Results for each regression can be found below.

Dependent Variable: Mid-test reading achievement.

The overall regression equation performed to examine the effect of PwrHrs participation on students' mid-test reading achievement was significant, $F(8, 558) = 504.04, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 87.8%, adjusted $R^2 = 87.6\%$. According to Cohen (1988), this is a large effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .001. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, only accounted for 0.1% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' mid-test reading scores $F(6, 560) = 71.03, p < .001$ and accounted for 43.2% of the variance in students' mid-test reading scores. Reading pretest scores significantly predicted students mid-test reading scores, change in $F(1, 559) = 2038.45, p < .001$, and accounted for an additional 44.6% of the variance in students' mid-test reading scores. Finally, PwrHrs

participation did not contribute significantly to the regression equation, change in $F(1, 558) = 2.97, p = .09$ and accounted for an additional 0.1% of the variance in students' mid-test reading scores.

Dependent Variable: Posttest reading achievement.

The overall regression equation performed to examine the effect of PwrHrs participation on students' posttest reading achievement was significant, $F(8, 558) = 340.73, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 83%, adjusted $R^2 = 82.8\%$. According to Cohen (1988), this is a large effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' posttest reading scores $F(6, 560) = 74.49, p < .001$ and accounted for 44.4% of the variance in students' posttest reading scores. Reading pretest scores significantly predicted students posttest reading scores, change in $F(1, 559) = 1270.57, p < .001$, and accounted for an additional 38.6% of the variance in students' posttest reading scores. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 558) = .01, p = .94$ and did not account for any additional variance in students' posttest reading scores.

Dependent variable: Reading report card grades at Time 1.

The overall regression equation performed to examine the effect of PwrHrs participation on students' reading report card grades at Time 1 was significant, $F(8, 558) = 81.62, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The

total amount of variance accounted for by the covariates and reading pretest scores was 53.9%, adjusted $R^2 = 53.2\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .002. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0.2% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' reading report card grades at Time 1 $F(6, 560) = 16.78, p < .001$ and accounted for 15.2% of the variance in students' reading report card grades at Time 1. Reading pretest scores significantly predicted students' reading report card grades at Time 1, change in $F(1, 559) = 465.48, p < .001$, and accounted for an additional 38.5% of the variance in students' reading report card grades at Time 1. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 558) = 2.08, p = .15$ and accounted for an additional 0.2% of the variance in students' reading report card grades at Time 1.

Dependent variable: Reading report card grades at Time 2.

The overall regression equation performed to examine the effect of PwrHrs participation on students' reading report card grades at Time 2 was significant, $F(8, 558) = 140.99, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 66.8%, adjusted $R^2 = 66.4\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .001. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0.1% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' reading report card grades at Time 2 $F(6, 560) = 15.17, p < .001$ and accounted for 14% of the variance in students' reading report card grades at Time 2. Reading pretest scores significantly predicted students' reading report card grades at Time 2, change in $F(1, 559) = 889.80, p < .001$, and accounted for an additional 52.8% of the variance in students' reading report card grades at Time 2. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 558) = 1.56, p = .21$ and accounted for an additional 0.1% of the variance in students' reading report card grades at Time 2.

Dependent Variable: Mid-test math achievement.

As stated previously, this analysis did not include fourth and fifth grade participant data. The overall regression equation performed to examine the effect of PwrHrs participation on students' mid-test math achievement was significant, $F(8, 311) = 63.37, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 61.8%, adjusted $R^2 = 61\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .001. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, only accounted for 0.1% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' mid-test math scores $F(6, 313) = 36.39, p < .001$ and accounted for 41.1% of the variance in students' mid-test reading scores. Math pretest scores significantly predicted students' mid-test math scores, change in $F(1, 312) = 169.68, p < .001$, and accounted for an additional 20.8% of the variance in students' mid-test math scores. Finally, PwrHrs participation did not

contribute significantly to the regression equation, change in $F(1, 311) = 1.13, p = .29$ and accounted for an additional 0.1% of the variance in students' mid-test math scores.

Dependent Variable: Posttest math achievement.

As stated previously, this analysis did not include fifth grade participant data. The overall regression equation performed to examine the effect of PwrHrs participation on students' posttest math achievement was significant, $F(8, 426) = 24.21, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 31.2%, adjusted $R^2 = 30.1\%$. According to Cohen (1988), this is a small effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' posttest math scores $F(6, 428) = 9.63, p < .001$ and accounted for 11.9% of the variance in students' posttest math scores. Math pretest scores significantly predicted students posttest math scores, change in $F(1, 427) = 12.05, p < .001$, and accounted for an additional 19.3% of the variance in students' posttest math scores. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 426) = .14, p = .71$ and did not account for any additional variance in students' posttest math scores.

Dependent variable: Math report card grades at Time 1.

The overall regression equation performed to examine the effect of PwrHrs participation on students' math report card grades at Time 1 was significant, $F(8, 558) = 43.13, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total

amount of variance accounted for by the covariates and math pretest scores was 38.2%, adjusted $R^2 = 37.4\%$. According to Cohen (1988), this is a small effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' math report card grades at Time 1 $F(6, 560) = 17.98, p < .001$ and accounted for 16.2% of the variance in students' math report card grades at Time 1. Math pretest scores significantly predicted students' math report card grades at Time 1, change in $F(1, 559) = 199.48, p < .001$, and accounted for an additional 22.1% of the variance in students' math report card grades at Time 1. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 558) = .02, p = .90$ and did not account for any additional variance in students' math report card grades at Time 1.

Dependent variable: Math report card grades at Time 2.

The overall regression equation performed to examine the effect of PwrHrs participation on students' math report card grades at Time 2 was significant, $F(8, 558) = 94.24, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 57.4%, adjusted $R^2 = 56.9\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' math report card grades at Time 2 $F(6, 560) = 15.44, p < .001$ and accounted for 14.2% of the variance in students' math report card grades at Time 2. Math pretest scores significantly predicted students' math report card grades at Time 2, change in $F(1, 559) = 568.15, p < .001$, and accounted for an additional 43.3% of the variance in students' math report card grades at Time 2. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 558) = .30, p = .59$ and did not account for any additional variance in students' math report card grades at Time 2.

Research Question 2

The order of entry into each of the regression models was as follows. First, the effect of covariates was examined. Covariates included school day attendance, grade level, household income, gender, ethnicity/race, and English Language Learner status. In the second step, the effect of pretest data was tested, and in the final step, the effect of exposure to PwrHrs SEL instruction was examined. Overall, one significant main effect was found on mid-test reading achievement. Results for each regression can be found below.

Dependent Variable: Mid-test reading achievement.

The overall regression equation performed to examine the effect of PwrHrs participation on students' mid-test reading achievement was significant, $F(8, 311) = 253.22, p < .001$. In terms of the separate steps of the regression, covariates were a significant predictor of students' mid-test reading scores $F(6, 313) = 32.36, p < .001$ and accounted for 38.3% of the variance in students' mid-test reading scores. Reading pretest scores significantly predicted students mid-test reading scores, change in $F(1, 312) = 1115.26, p < .001$, and accounted for an additional 48.2% of the variance in students' mid-test reading scores. Finally, PwrHrs participation also

contributed significantly to the regression equation, change in $F(1, 311) = 4.25, p = .04$ and accounted for an additional 0.2% of the variance in students' mid-test reading scores. Exposure to PwrHrs SEL instruction was positively associated with students' mid-test reading achievement. That is, students who had greater exposure to PwrHrs SEL instruction had, on average, slightly higher mid-test reading scores than students with less exposure to PwrHrs SEL instruction.

Dependent Variable: Posttest reading achievement.

The overall regression equation performed to examine the effect of PwrHrs participation on students' posttest reading achievement was significant, $F(8, 311) = 182.64, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 82.4%, adjusted $R^2 = 82\%$. According to Cohen (1988), this is a large effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' posttest reading scores $F(6, 313) = 36.75, p < .001$ and accounted for 41.3% of the variance in students' posttest reading scores. Reading pretest scores significantly predicted students posttest reading scores, change in $F(1, 312) = 730.50, p < .001$, and accounted for an additional 41.1% of the variance in students' posttest reading scores. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 311) = .16, p = .69$ and did not account for any additional variance in students' posttest reading scores.

Dependent variable: Reading report card grades at Time 1.

The overall regression equation performed to examine the effect of PwrHrs participation on students' reading report card grades at Time 1 was significant, $F(8, 311) = 48.77, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 55.6%, adjusted $R^2 = 54.6\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' reading report card grades at Time 1 $F(6, 313) = 10.24, p < .001$ and accounted for 16.4% of the variance in students' reading report card grades at Time 1. Reading pretest scores significantly predicted students' reading report card grades at Time 1, change in $F(1, 312) = 275.46, p < .001$, and accounted for an additional 39.2% of the variance in students' reading report card grades at Time 1. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 311) = .28, p = .60$ and did not account for any additional variance in students' math report card grades at Time 1.

Dependent variable: Reading report card grades at Time 2.

The overall regression equation performed to examine the effect of PwrHrs participation on students' reading report card grades at Time 2 was significant, $F(8, 311) = 92.07, p < .001$. However, this overall significant effect is attributed to the covariates and reading pretest. The total amount of variance accounted for by the covariates and reading pretest scores was 70%, adjusted $R^2 = 69.4\%$. According to Cohen (1988), this is a medium to large effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .003. Therefore,

while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0.3% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' reading report card grades at Time 2 $F(6, 313) = 9.12, p < .001$ and accounted for 14.9% of the variance in students' reading report card grades at Time 2. Reading pretest scores significantly predicted students' reading report card grades at Time 2, change in $F(1, 312) = 574.09, p < .001$, and accounted for an additional 55.2% of the variance in students' reading report card grades at Time 2. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 311) = 2.97, p = .09$ and accounted for an additional 0.3% of the variance in students' reading report card grades at Time 2.

Dependent Variable: Mid-test math achievement.

As stated previously, this analysis did not include fourth and fifth grade participant data. The overall regression equation performed to examine the effect of PwrHrs participation on students' mid-test math achievement was significant, $F(8, 175) = 34.31, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 60.6%, adjusted $R^2 = 59.1\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .004. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, only accounted for 0.4% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' mid-test math scores $F(6, 177) = 19.62, p < .001$ and accounted for 39.9% of the variance in students' mid-test reading scores. Math pretest scores significantly predicted students

mid-test math scores, change in $F(1, 176) = 92.60, p < .001$, and accounted for an additional 20.7% of the variance in students' mid-test math scores. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 175) = 1.91, p = .17$ and accounted for an additional 0.4% of the variance in students' mid-test math scores.

Dependent Variable: Posttest math achievement.

As stated previously, this analysis did not include fifth grade participant data. The overall regression equation performed to examine the effect of PwrHrs participation on students' posttest math achievement was significant, $F(8, 248) = 10.68, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 25.2%, adjusted $R^2 = 23.1\%$. According to Cohen (1988), this is a small effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .004. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0.4% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' posttest math scores $F(6, 250) = 4.21, p < .001$ and accounted for 9.2% of the variance in students' posttest math scores. Math pretest scores significantly predicted students posttest math scores, change in $F(1, 249) = 53.49, p < .001$, and accounted for an additional 16.1% of the variance in students' posttest math scores. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 248) = 1.29, p = .26$ and accounted for an additional 0.4% of the variance in students' posttest math scores.

Dependent variable: Math report card grades at Time 1.

The overall regression equation performed to examine the effect of PwrHrs participation on students' math report card grades at Time 1 was significant, $F(8, 311) = 23.34, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 37.5%, adjusted $R^2 = 36.1\%$. According to Cohen (1988), this is a small effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .00. Therefore, while the overall regression was significant, the independent variable, PwrHrs participation, accounted for 0% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' math report card grades at Time 1 $F(6, 313) = 8.89, p < .001$ and accounted for 14.6% of the variance in students' math report card grades at Time 1. Math pretest scores significantly predicted students' math report card grades at Time 1, change in $F(1, 312) = 114.41, p < .001$, and accounted for an additional 22.9% of the variance in students' math report card grades at Time 1. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 311) = .18, p = .67$ and did not account for any additional variance in students' math report card grades at Time 1.

Dependent variable: Math report card grades at Time 2.

The overall regression equation performed to examine the effect of PwrHrs participation on students' math report card grades at Time 2 was significant, $F(8, 311) = 47.45, p < .001$. However, this overall significant effect is attributed to the covariates and math pretest. The total amount of variance accounted for by the covariates and math pretest scores was 54.9%, adjusted $R^2 = 53.9\%$. According to Cohen (1988), this is a medium effect size. PwrHrs participation, when added to the regression model, resulted in R^2 change = .001. Therefore, while the overall

regression was significant, the independent variable, PwrHrs participation, accounted for 0.1% of variance, indicating a non-significant main effect.

In terms of the separate steps of the regression, covariates were a significant predictor of students' math report card grades at Time 2 $F(6, 313) = 6.91, p < .001$ and accounted for 11.7% of the variance in students' math report card grades at Time 2. Math pretest scores significantly predicted students' math report card grades at Time 2, change in $F(1, 312) = 298.64, p < .001$, and accounted for an additional 43.2% of the variance in students' math report card grades at Time 2. Finally, PwrHrs participation did not contribute significantly to the regression equation, change in $F(1, 311) = .60, p = .44$ and accounted for an additional 0.1% of the variance in students' math report card grades at Time 2.

DISCUSSION

Increasing numbers of schools have chosen to implement SEL curriculum and instruction to meet the pressures of recent public education reform initiatives, as it is associated with increased academic performance (Zins, Bloodworth, Weissberg, & Walberg, 2004). PwrHrs, an after-school program, is one such program. Past single-group pretest-posttest evaluations of the PwrHrs, have revealed that PwrHrs youth exhibited growth in reading, mathematics, and social-emotional competency (“PwrHrs Evaluation Comparison”, 2017). The purpose of this study was to examine the overall effect of the PwrHrs program on participant reading and mathematics achievement through non-randomized control group comparison design.

It was expected that compared to non-PwrHrs youth, PwrHrs participants would demonstrate significantly higher performance in reading and math achievement and report card grades than non-PwrHrs participants; however, study results did not support this hypothesis. While overall significance was found in each regression analysis, the significance was attributed to the covariates, primarily pretest. It was also expected that greater exposure to PwrHrs SEL instruction would be positively associated with higher performance in reading and math achievement and report card grades; however, the majority of study results did not support these hypotheses. A single significant effect of increased PwrHrs SEL instruction exposure on reading and math achievement growth was found. While overall significance was found in each regression analysis, the significance was attributed to the covariates and applicable pretest. Overall, the majority of study results suggest that program participation and increased exposure to PwrHrs SEL instruction did not affect youth reading and math achievement.

These findings were somewhat surprising, given three main factors. First, positive associations between student participation in after-school programming and academic growth are well documented (see Durlak and Weissberg, 2007). Second, positive associations between SEL instruction and academic growth are also well documented (see Durlak et al., 2011). Third, as discussed previously and seen in Table 3 and 4, PwrHrs demonstrates all characteristics of effective SEL programming according to Zins and Elias (2007) and aligns with CASEL competencies. Despite the alignment with these factors PwrHrs exhibits, significant program effects were not found.

These non-significant results could be due to several factors, including the effect of multicollinearity among variables, unidentified covariates, and non-representative sample characteristics. In regard to the statistical issue of multicollinearity, strong positive correlations among pre- and posttests included within the study were observed, leaving relatively little variance to be explained by the intervention. This may indicate that the PwrHrs program did not disrupt these correlations enough to indicate a significant effect or that student achievement trajectories were stable.

Unidentified covariates may include unmeasured environmental conditions and varying individual characteristics which can lead to unintentional biases. An example of a potential unidentified covariate includes the effect of acculturation. Acculturation is the process by which an individual adapts to a new culture by maintaining some of the beliefs and values of the original culture and integrating some of the beliefs and values of the new culture (Siatkowski, 2007). It is often used in studies to measure the effects of cultural beliefs and values, as well as how these effects may change as an individual integrates into the new culture (Siatkowski, 2007); however, it was not measured or considered within the current study's design.

Acculturation has been found to have a moderating effect on after-school program effects in field literature, particularly in regard to reading and spelling achievement. Participants that reported higher levels of acculturation exhibited greater gains in reading and spelling achievement (Riggs & Greenberg, 2004). Given that 83% of the study participants are identified as Hispanic/Latinx, it is possible that unmeasured acculturation effects may have had an impact on results.

Regarding sample characteristics, participant data is not entirely representative of national averages in terms of ethnicity or number of students indicated as English Language Learners. As mentioned previously, PwrHrs participants, as a group, were not nationally representative in terms of ethnicity, as it was comprised of approximately 86.3% Hispanic/Latinx participants ($n = 276$) vs. a national average of 24.4% (U.S. Census Bureau, 2016). Additionally, this group was not nationally representative in regard to number of English Language Learner (ELL) students ($n = 229$), with 71.6% of intervention group participants indicated as ELL students vs. a national average of 9.5% (National Center for Education Statistics, 2018). While these characteristics can make results difficult to generalize to the national population, they could be considered a strength in that this studied the potential influence of after-school programming on an underserved population.

Limitations

Several limitations exist within this study, many of which are common to studies that utilize secondary data (Rossi et al., 2004). Possible threats to internal validity inherent with this experimental design include maturation, history, repeat testing effects, and the potential for self-selection bias. In regard to self-selection bias, it is possible that participants who are exposed to more social-emotional curriculum through their participation in the PwrHrs program may not be representative of the population, given that their family has enrolled them in the program.

Additional limitations include demographic differences in group composition within the study, as well as the selection of measurement tools used for assessing math and reading achievement. The reading and math achievement assessment tools, DIBELS (Dynamic Indicators of Base Early Literacy Skills) Curriculum-Based Measurement of Oral Reading Fluency (CBM ORF) and AIMSweb Math Computation (M-Comp) respectively, are designed to measure student achievement within English language contexts (see Good & Kaminski, 2002; NCS Pearson, 2012). Additionally, any potential accommodations granted to students during assessment periods are unknown. These accommodations have the potential to introduce bias into reading and math achievement scores. Strengths, however, lie in the large number of participants in the study, as well as the overall quality of the data pool being used.

IMPLICATIONS AND FUTURE DIRECTIONS

Information gained through this study is aimed to contribute to PwrHrs program design and implementation. Though no significant effects were found, this study elucidates potential areas of refinement within the PwrHrs' program. Study results have prompted a new question: what can PwrHrs do to strengthen their program to obtain effective results?

First, PwrHrs could attempt to increase student program dosage by increasing the number of days the program is offered. Currently, PwrHrs takes place only three to four days a week, depending on school scheduling. Offering the PwrHrs program more frequently may result in increased student dosage, potentially leading to more effective results.

Second, PwrHrs could consider refining program design by amending the PwrHrs core values. As previously discussed, PwrHrs currently utilizes five core social-emotional 'values' to drive SEL curriculum design: Perseverance, Ownership, Wellness, Empowerment, and Respect. PwrHrs might consider exchanging core values for the SEL competencies set forth by the Research and Guidelines Committee of the Collaborative for Academic, Social, and Emotional Learning (CASEL), which are widely adopted in SEL instruction and curriculum (Axelrod, 2010; Elias et al., 1997). Targeting these competencies would not only promote PwrHrs as a program engaged in research-based practices, but would also align the SEL components of the PwrHrs program practices to those measured by the Devereux Student Strengths Assessment (DESSA). The DESSA was used as a measurement within the original dataset provided to Colorado State University. Future analyses of program efficacy using this measurement would be enriched by measuring identical social-emotional competencies.

Third, due to the high population of ELL students within the study participant pool, perhaps modified tools and strategies should be implemented in order for program expectations to be met. Students who are ELLs have been identified as a group at risk for social-emotional and academic problems (Castro-Olivo, 2014). Other programs have met these problems with SEL- based curriculum aimed to provide students with skills that “explicitly help them to cope with the many sociocultural challenges that they face in the U.S. schools and society” (Castro-Olivo, 2014, p. 2).

One example of these programs is the Jóvenes Fuertes (Strong Teens) program, designed to foster social-emotional growth of Latino English language learners. Efficacy studies of the program demonstrated significant intervention effects on student SEL knowledge and social-emotional resiliency (Castro-Olivo, 2014). The primary focus of this method is to tailor SEL instruction with particular consideration to the unique challenges faced by ELL students, such as social alienation and acculturation stress. In the future, PwrHrs may enhance program effectiveness through the implementation of strategies aimed specifically to serve this unique student population within the school district.

Future research directions may include exploratory analyses regarding specific PwrHrs core values and underlying constructs. Future research could examine whether or not specific values are associated with academic growth. Increased knowledge in this area may result in changes within PwrHrs program design by shifting focus towards variables which may lead to higher program efficacy. For instance, if the core value of Empowerment significantly affects reading performance, program facilitators may increase student exposure to this particular core value.

Similarly, future research could address underlying constructs within the study by running factor analyses. Multicollinearity was a potential limitation within the current study, so it may be helpful to understand underlying constructs, which could provide insight into important pieces of PwrHrs' program design. For example, should future analysis discover emotion knowledge to be a significant underlying concept associated with increased academic achievement, the PwrHrs team may consider promoting specific strategies throughout program design and staff training in order to increase student exposure to this potential benefit. Considering these recommendations may contribute to program improvement and refinement, potentially resulting in greater program efficacy.

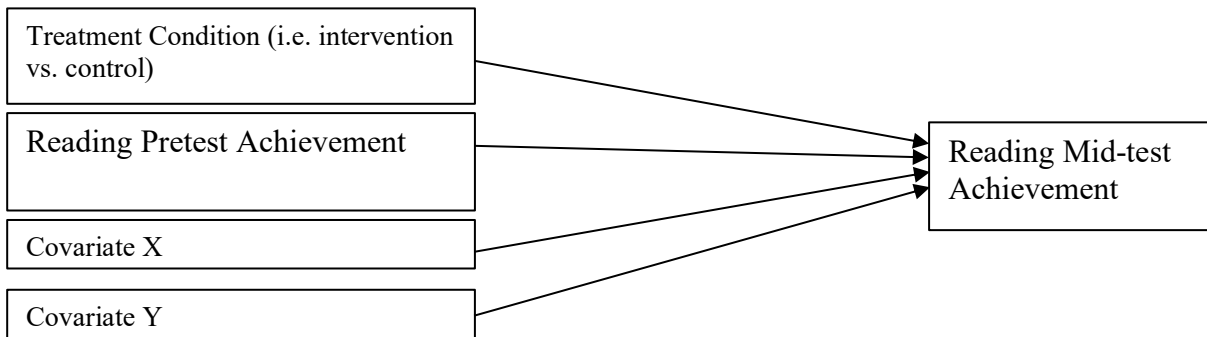
CONCLUSION

Recent public education reform initiatives have emphasized student academic achievement, primarily in reading and mathematics. To meet the pressure these initiatives present, a growing number of schools have chosen to implement social-emotional learning (SEL) curriculum and instruction, as it is hypothesized to promote academic development. PwrHrs seeks to enrich students' academic and social-emotional competence through supplemental academic tutoring and intentional SEL instruction.

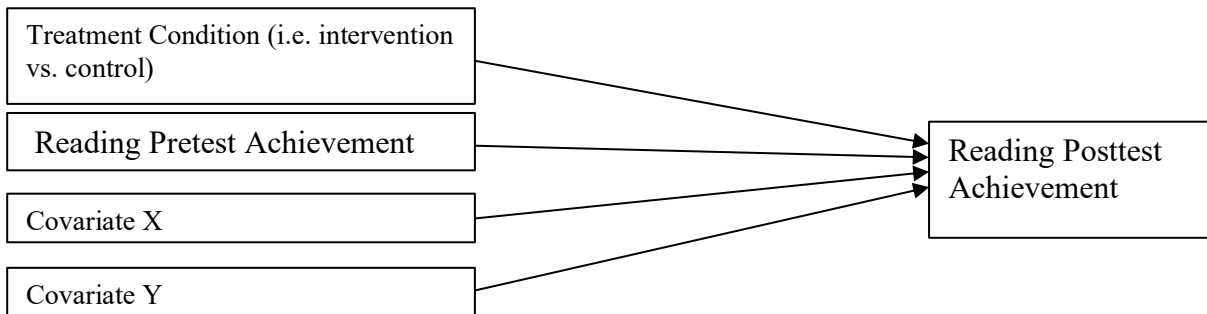
The current study explored the social-emotional program components potentially responsible for gains in PwrHrs participants' reading and mathematics scores and report card grades. Results revealed a significant effect of PwrHrs SEL instruction on reading mid-test achievement; however, this was the only significant effect found. Several potential explanations for these findings were explored, and recommendations were proposed to potentially increase program effects through program design and implementation. Further research and refinement is yet to be done, which may lead to increased social-emotional learning and academic outcomes as a result of the efforts of PwrHrs and YouthPower365.

Analysis #1

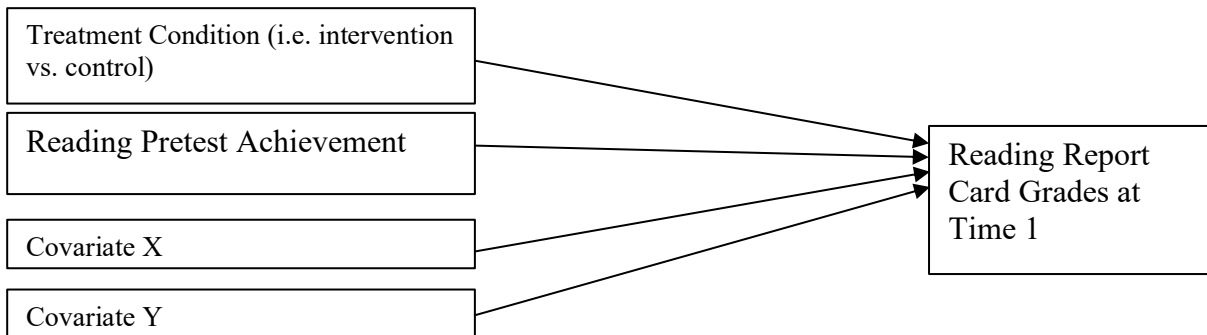
FIGURES



Analysis #2



Analysis #3



Analysis #4

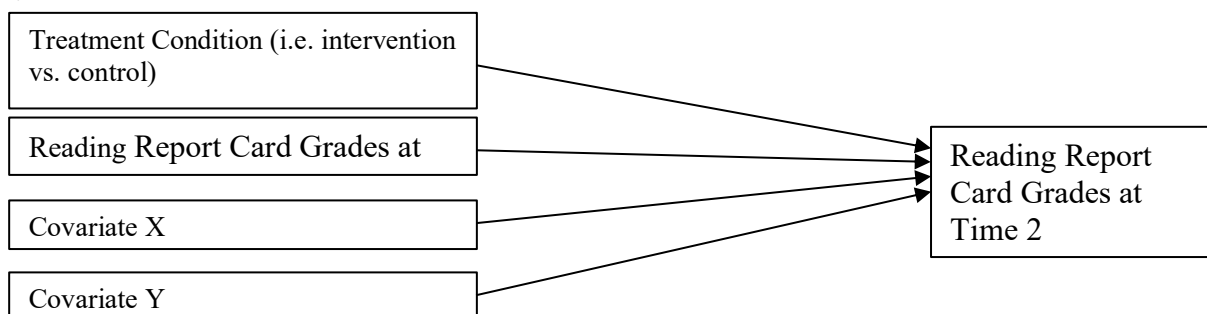
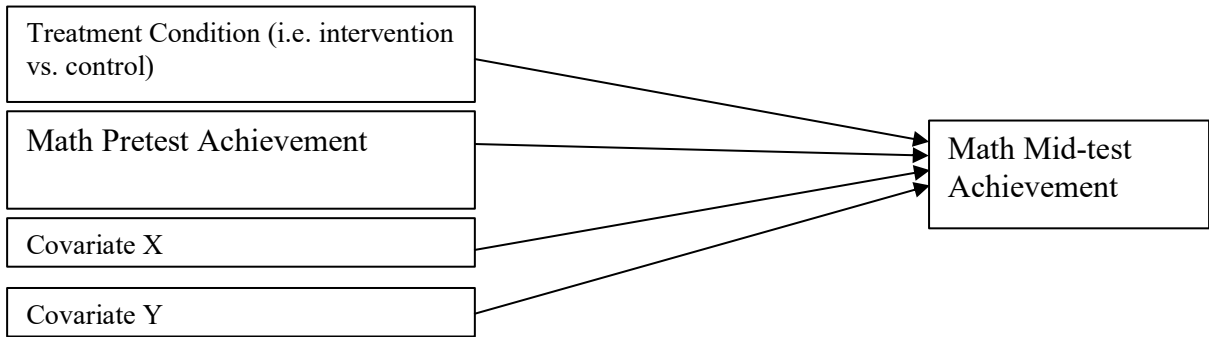
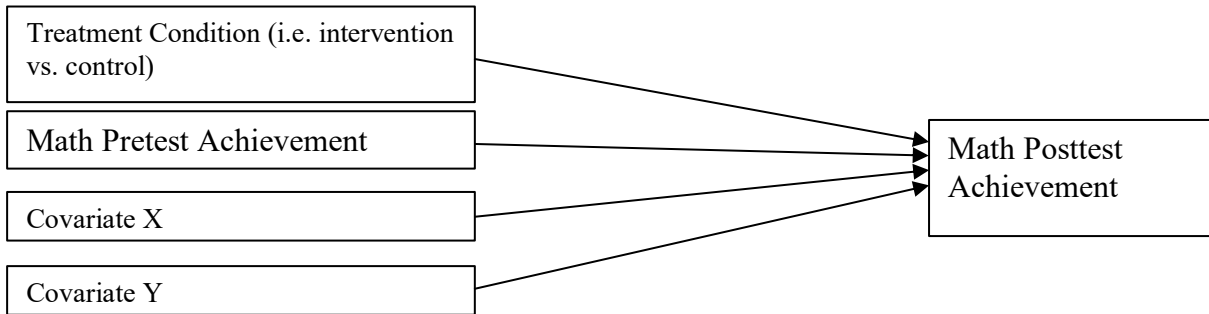


Figure 1. Models of the proposed multiple regression analyses to be performed in order to evaluate the effect of PwrHrs participation on reading and math achievement, controlling for appropriate covariates.

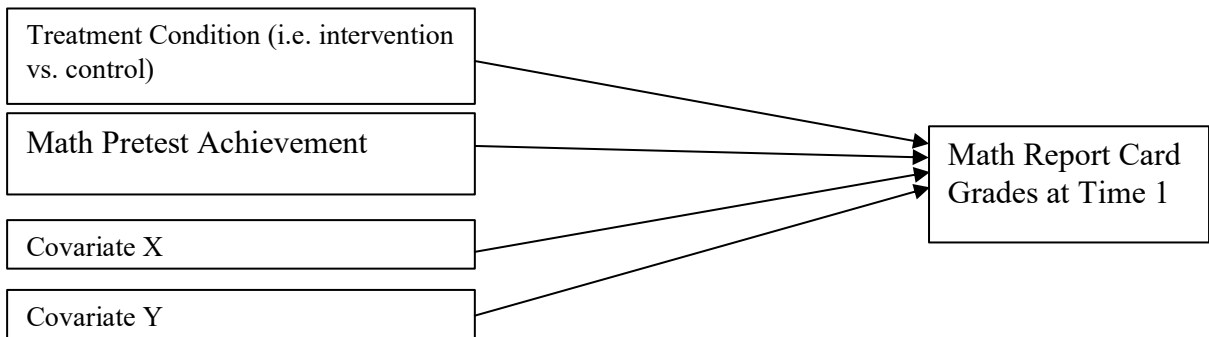
Analysis #5



Analysis #6



Analysis #7



Analysis #8

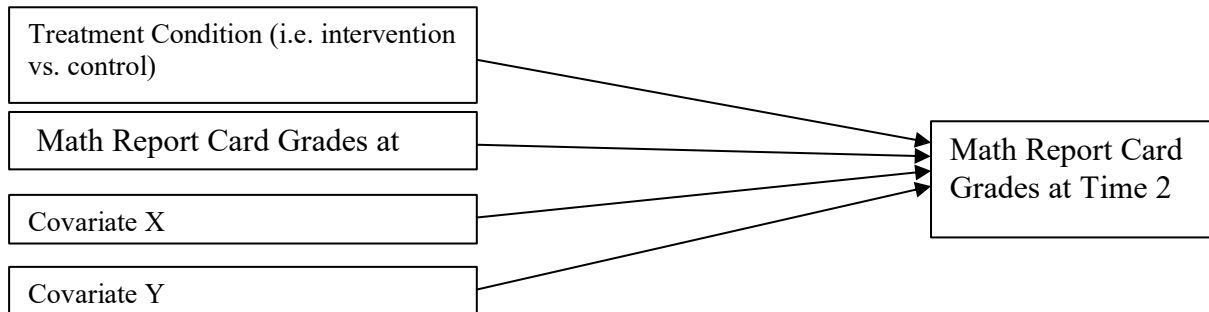
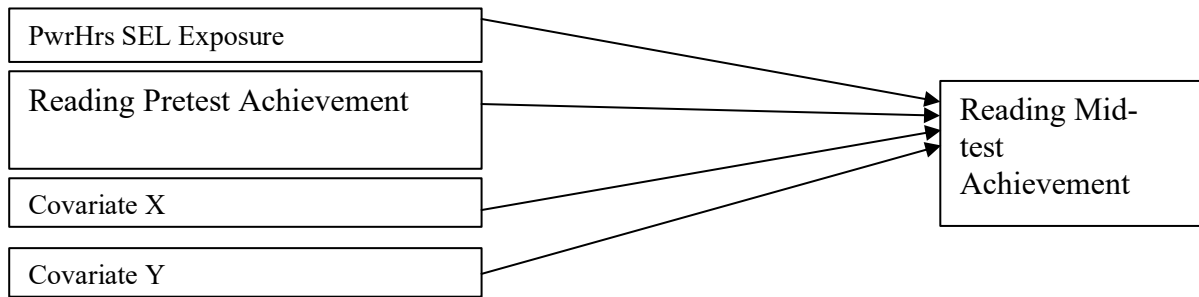
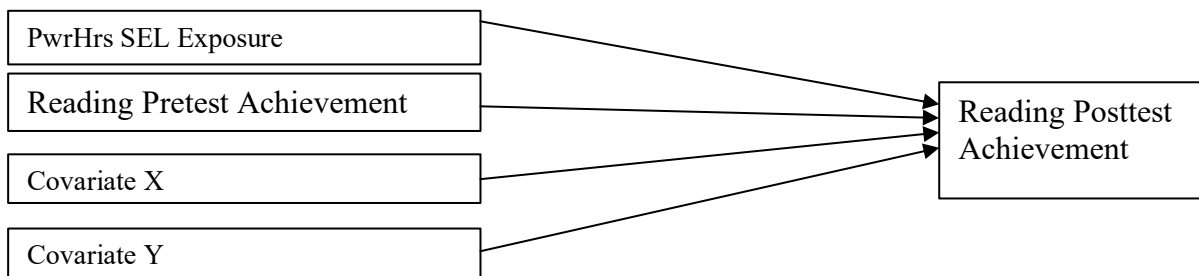


Figure 2. Models of the proposed multiple regression analyses to be performed in order to evaluate the effect of PwrHrs participation on reading and math achievement, controlling for appropriate covariates.

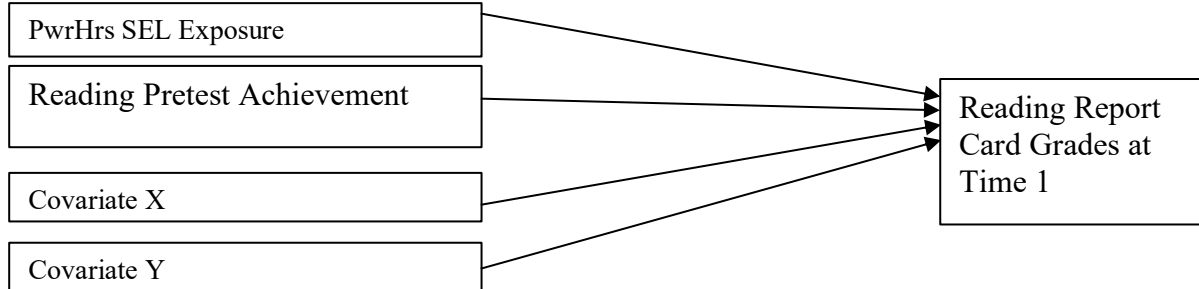
Analysis #1



Analysis #2



Analysis #3



Analysis #4

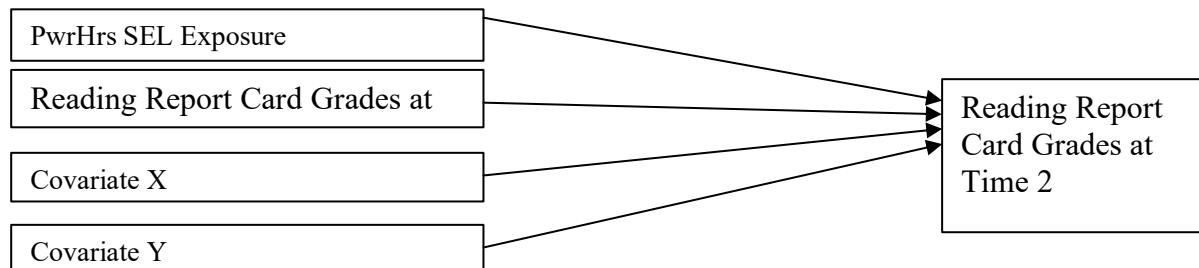
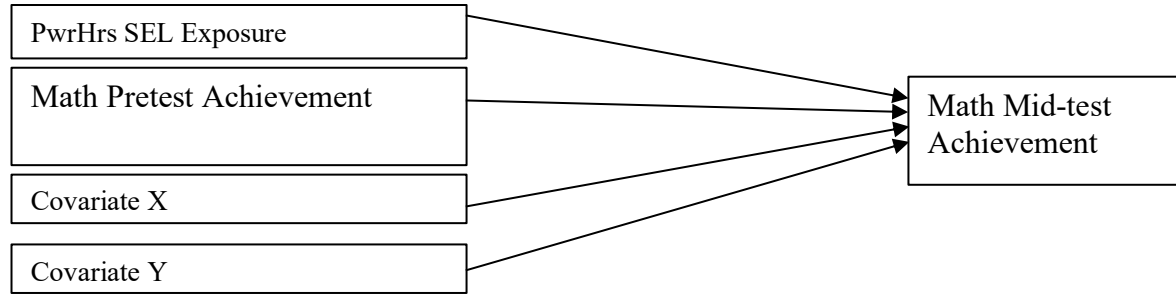
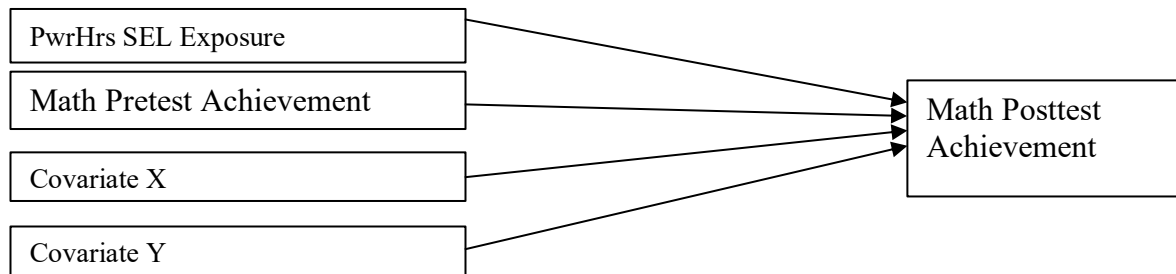


Figure 3. Models of the proposed multiple regression analyses to be performed in order to evaluate the effect of exposure to PwrHrs SEL instruction on reading and math achievement, controlling for covariates.

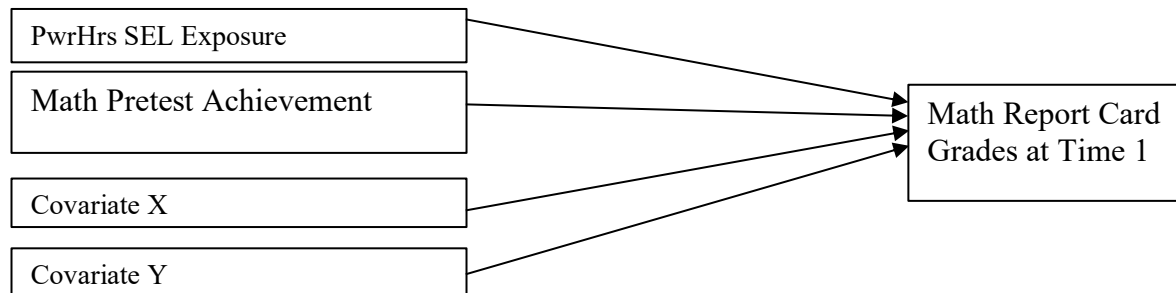
Analysis #5



Analysis #6



Analysis #7



Analysis #8

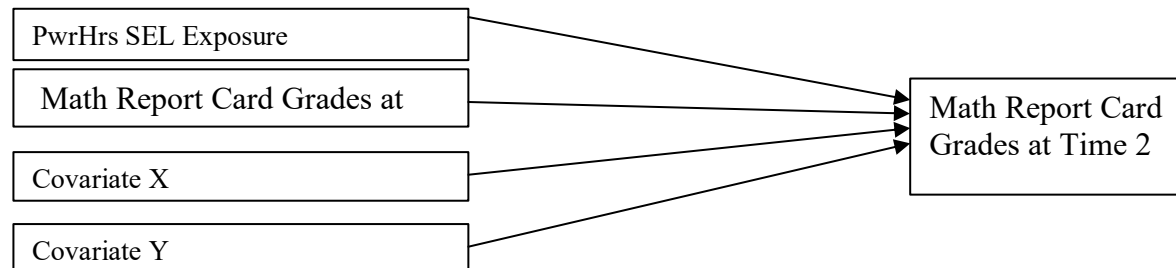


Figure 4. Models of the proposed multiple regression analyses to be performed in order to evaluate the effect of exposure to PwrHrs SEL instruction on reading and math achievement, controlling for covariates.

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