# IT'S A MATTER OF TIME: A QUANTITATIVE STUDY EXAMINING THE IMPACT OF INVISIBLE MENTORS ON THE INITIAL SEMESTER GRADES OF STRUGGLING HIGH SCHOOL STUDENTS

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AUTHORIZATION TO SUBMIT

DISSERTATION

This dissertation of Eric Hogan, submitted for the degree of Doctor of Education with a major in Educational Leadership and titled IT'S A MATTER OF TIME: A QUANTITATIVE STUDY EXAMINING THE IMPACT OF INVISIBLE MENTORS ON THE INITIAL SEMESTER GRADES OF STRUGGLING HIGH SCHOOL STUDENTS has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.

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# DEDICATION

I wish to dedicate this dissertation to my father, Brian Hogan, who has always modeled academic commitment and excellence to me and my entire family. I would also like to dedicate this to all the great educators who I have worked alongside for the past 30 years; from my student teaching experience at Puyallup High School, 15 years in the Franklin Pierce School District, my administrative beginnings in the Bremerton School District, and finally to the last decade in the Puyallup School District. I am blessed to have been surrounded by teachers and administrators who were passionate about the success of each and every student. It is an honor to call you friends and colleagues. Finally, to Jason Smith, who has never stopped believing that I have something more to give to kids, parents, teachers, and education.

# ABSTRACT

Extensive research confirms that a high school diploma has a lasting value on future educational opportunities and career goals. Some students, in their transition to high school, can harm grade point averages to such a degree that future opportunities for rigorous courses or post-high school opportunities are diminished. Caring relationships are a critical element in the motivation and encouragement of most of life's endeavors and the purposeful creating of this type of relationship within the school day could have a positive impact on a students' success. The improvement in semester grades for the first semester of high school could only serve to increase the probability of future success in school.

This quantitative study, utilizing a quasi-experimental design, looked at the immediate impact of using teachers as mentors for struggling students during the first semester of their transitional year of high school at a suburban, middle-class high school in the Pacific Northwest. The students were not aware that the teacher had been assigned to them, hence the term *invisible mentor*, in order to examine the impact of natural forming relationships.

Two-sample t-tests were conducted on the mean grade point averages of the struggling students who had *invisible mentors* for their transitional semester into high school. The results conclude that such a mentoring program had a positive impact on the first semester grades of the first semester of high school. Linear regression scatter plots showed positive relationship between the frequency of interactions that an invisible mentor has with a mentee and their academic improvement, as measured by GPA. This study scratches the surface into the impact of *invisible mentoring* for struggling students in this suburban, Pacific Northwest school district. Additional research may serve to strengthen these initial findings that promote the academic improvement of struggling students.

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# Chapter I

## Introduction

High school graduation is a culminating event imbedded in American culture and documented in movies and television shows. Viewed by the majority as an expected and natural milestone, high school graduation is representative of the rite of passage into adulthood much like one's 18th birthday. This iconic event serves as a launching pad for college and career readiness. Despite a global recognition on the importance of graduation, many students, up to 17% nationally, fail to attain a high school diploma (Clark & Martorell, 2014; National Center for Education Statistics, 2016; Schulz & Rubel, 2011). Additionally, a significant number of students graduate with a transcript weighted down by a low grade point average (GPA) which limits the opportunities available after completion of high school (Geiser & Santelices, 2007; Long, Conger, & Iatarola, 2012)

The role of the American high school has evolved over the years from primarily college-prep in the early 20th century, to an expectation of attendance for all teens in the mid-20th century (Campbell & Sherington, 2013; Goldin, 1998). The transformation continued into the 1970's with a push to have all students successfully attain a high school diploma (Goldin, 1998). The graduation rate of American high school students trended upward during the span of 1900 to 2013, increasing from approximately 10% to 80%. The only significant dip during this time was the World War II years of the early and mid-1940's (Snyder & National Center for Education Statistics, 1993). According to the National Center for Education Statistics (2014), the on-time graduation rate for American high school students is currently at an unsurpassed high of 81%. Despite such increase, these numbers demonstrate that approximately 700,000 students fail to achieve a diploma each year.

Recent statistics show that, consistently, individuals who fail to graduate from high school represent the lowest rate of employment when compared to people with higher levels of formal education (Autor, 2014; Fan & Wolters, 2012; National Center for Education Statistics, 2014). Additionally, a quality education has non-monetary benefits to the health, confidence, and intrinsic satisfaction of adults throughout America and abroad (Gathmann, Jürges, & Reinhold, 2015; Mazumder, 2011). The greater the academic success of a high school student, as measured by grade point average (GPA) and a rigorous schedule, the more likely of post-secondary enrollment (Ackerman, Kanfer, & Calderwood, 2013; Carnevale, 2008; Sawyer, 2013).

The high school diploma is the foundation of our educational system (Benner, 2011; Isakson & Jarvis, 1999; Weiss & Bearman, 2007). Extensive research has disclosed that it is typical for grades to plummet during the transition year into high school as a result of both academic and personal stressors. This can limit options and success in subsequent courses (Hanewald, 2013; Isakson & Jarvis, 1999; Royster, Gross, & Hochbein, 2015; Vasquez-Salgado & Chavira, 2014). Additionally, the higher the grade point average of students in middle school and high school, the greater the probability that the students will remain in school and incrementally increase the likelihood of graduation (Barrington & Hendricks, 1989; Benner, 2011; Weiss & Bearman, 2007).

Educators, parents, and guardians have acknowledged the struggles that exist for all students working to obtain a valuable high school diploma. Collectively, the concept of utilizing supportive adults in a mentoring capacity to guide students to academic success is endorsed (Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Herrera & Karcher, 2013; Slack, Johnson, Dodor, & Woods, 2013). Research in quantitative studies indicates that quality

mentoring can have a positive impact on struggling students, although with the caution that no mentoring may be better than ineffective mentoring (Black, Grenard, Sussman, & Rohrbach, 2010; Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Haddad, Chen, & Greenberger, 2011; McQuillin, Smith, & Strait, 2011; Radcliffe & Bos, 2011; Slicker & Palmer, 1993). Moreover, qualitative research, utilizing interviews with students and graduates, reinforces the long-term academic value of an adult who is attuned to the needs and goals of that student (Eller, Lev, & Feurer, 2014; Kiriakidis & Jenkin-Williams, 2014; Pryce, 2012; Simões & Alarcão, 2014). Interviews with high school graduates and college students repeatedly highlighted themes that highly successful students gave some credit to the presence of having a consistent mentor through their school years (Kiriakidis & Jenkin-Williams, 2014; Simões & Alarcão, 2014).

**Statement of the Problem**

Extensive research confirms that a high school diploma has a lasting value on future educational opportunities and career goals (Ackerman, Kanfer, & Calderwood, 2013; Carnevale, 2008; Sawyer, 2013). Research has also shown a correlation between academic achievement and non-monetary benefits (Gathmann, Jürges, & Reinhold, 2015; Mazumder, 2011). Mentoring is commonly viewed as a potentially positive factor in reaching one's goals (Monk et al., 2014; Pryce, 2012).

Although widespread understanding on the importance of graduation currently exists, an analysis of on-time-graduation rates confirms that almost 20% of high school students nationwide fail to attain a high school (National Center for Education Statistics, 2016). The high school graduation rates in the Pacific Northwest states - Washington, Oregon, and Idaho - mirrors the national average. Data analyzed from the three states discloses that approximately 200,000 students, representing 26% of the population, do not achieve a high school diploma (U.S.

Department of Education, 2015). These results make the Pacific Northwest an excellent location to pursue and understand interventions that may lead to greater success for struggling students.

Of further intrigue to this study are those students who are struggling to meet graduation requirements in middle-class, suburban communities where the academic success of their peers is significantly above the state and national average. The family income level of the suburbs in America are above the average income of cities and rural areas, and household/neighborhood income level is a powerful predictor that increases the likelihood of graduating from high school (Balfanz, Bridgeland, Bruce, & Fox, 2012; Wodtke, Harding, & Elwert, 2011). Students struggling academically to obtain a high school diploma, while surrounded by peers who are finding success at rates of over 90%, represent a unique subset of individuals. This study explored the use of a mentoring program for struggling students transitioning from middle school to high school who were enrolled in an above-average performing school district.

Grades, attendance, and discipline data have been identified as the most reliable predictors of whether a student would be at-risk to not graduate from high school (Hickman & Wright, 2011). Battin-Pearson et al. (2000) expanded this concept stating academic struggle was the only independent variable that was a significant predictor of a student failing to graduate from high school. Additionally, research has demonstrated that the younger a teenager receives a mentor the more likely academic and social gains would be achieved (Bryan et al., 2012; DuBois, Holloway, Valentine, & Cooper, 2002). These findings assist a school in quickly identifying which students will struggle to graduate, thereby making them a candidate for mentoring. A comprehensive high school has the resources to access all of these components.

The challenge remains to find an effective mentoring program for identified struggling high school students that promotes immediate academic success before lasting negative consequences (Grossman, Chan, Schwartz, & Rhodes, 2012; Schwartz, Rhodes, Spencer, & Grossman, 2013). The clear majority of successful teenage mentoring programs have shown positive impact to be related to the quality of the mentor-mentee relationship, and this often over a multi-year period (Deutsch & Spencer, 2009; Rhodes & Lowe, 2008). Research is needed to examine a mentoring program that would provide an intervention for struggling students at a large, suburban middle-class high school that would yield positive academic results before low grades negatively impacting high school transcripts.

**Background**

Transitional years in education, typically highlighted by the move from elementary school to middle level or middle level to high school, are often characterized by dips in academic success and overall well-being (Shoshani & Slone, 2013). Researchers have documented the potential negative impact on high school grades as students move into their high school years from the characteristically more nurturing environment of middle school or junior high (Benner & Graham, 2009; Pharris-Ciurej, Hirschman, & Willhoft, 2012; Russell, Mielke, Palmiter, Turner, & Vaden, 2012).

In addition to helping students navigate the changes in schools, it is valuable to explore research in identifying characteristics of youth who struggle in school and/or who are at risk to not graduate. Studies have identified prior poor grades, feelings of belonging and inclusion, the ability to cope with stress as indicators for students who are struggling academically in high school (Battin-Pearson et al., 2000; Lemon & Watson, 2011; Schulz & Rubel, 2011). A closer

look at identifying characteristics of students who may benefit from an academic mentor will assist schools in providing effective supports early in a students' high school years.

Widespread research has been conducted focusing on the impact of mentoring with voluntary students and/or students who have guardians seeking such support (Hickman & Wright, 2011; Lemon & Watson, 2011; Slicker & Palmer, 1993). Research also abounds on the effectiveness of mentoring programs that utilize mentors from organizations outside of the educational system (Grossman et al., 2012; Rhodes, Grossman, & Resch, 2000; Royse, 1998; Schwartz et al., 2013). Collectively, positive effects are shown when students have natural forming mentors (Beam et al., 2002; Haddad, Chen, & Greenberger, 2011; Liang, Spencer, Brogan, & Corral, 2008). These relationships, characterized by high support and minimal conflict, are of increased value as the mentor and mentee have a common goal (Beam et al., 2002). It is the use of a teacher as an *invisible mentor* that aimed to purposely create such an effective mentee/mentor relationship (Beam et al., 2002)

Although valuable data has been gained by existing studies, such interventions do not provide a quick turnaround academically that will minimize the negative impact on the current semester's grades. Furthermore, there is a vast amount of research on the value of a caring adult at schools (Bryan et al., 2012; Hardré, Sullivan, & Roberts, 2008; Martin, 2003; Pryce, 2012), but limited research on the effectiveness of using high school staff as one-on-one mentors for students identified as struggling in the initial months of the first year of high school.

**Research Questions**

The existence of a consistent, non-guardian adult in the school setting can assist a student in succeeding in their courses that leads to graduation (Bryan et al., 2012; Hardré, Sullivan, & Roberts, 2008; Martin, 2003; Pryce, 2012). Some students may not realize that such adults are

available for them, and as such, their grades are affected negatively. The goal of this study was to examine the benefits of a mentor committed to helping a struggling student navigate their first semester of high school. The mentor would be an *invisible mentor* for the purpose of this study in order to explore the impact of what Beam et al (2002) describe as a "natural forming mentor" (p. 308). The central research questions for this study included the following:

1) What is the impact of an *invisible mentor*, an adult teacher from the same suburban school, on the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
2) Is there a relationship between the frequency of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
3) Is there a relationship between the types of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

**Description of Terms**

Several technical terms are used in mentoring programs and in schools. In addition, Creswell (2015) stresses the importance of clear definitions for terms to enhance the clarity of any study and the ensuing results. Based on the research literature in this study, this section attempts to clarify these terms.

**American High School.** A phrase used to represent a typical comprehensive high school in America. This school is typically grades, 9-12 although in some cases the 9$^{th}$ grade year may be housed in a Junior High.

**At-risk.** Adolescents struggling to be academically successful with a traditional secondary school to a degree that places high school graduation at likely risk. (Dynarski et al., 2008)

**Core GPA.** For the purpose of this study, the research used the grades of math, science, and English courses to calculate a core GPA that excluded the various other elective courses. Each student in the study were enrolled in these core course during their freshman and sophomore years in high school.

**Invisible Mentors.** A term utilized by the researcher to signify that the mentees was not aware that an adult teacher had been assigned to them as a mentor.

**Mentoring.** For the sake of this literature review and study, mentoring will refer specifically to one-on-one guidance between two people with one of them being significantly older than the other (Beam, Chen, & Greenberger, 2002).

**Mentoring Duration.** For the purpose of this study, the mentor-mentor relationship was for the first semester of the first year of high school, a period of 14 weeks.

**On-Time Graduation.** A term utilized to recognize those students who have met their high school graduation requirements in 4 years or less starting in $9^{th}$ grade.

**Overall Grade Point Average (GPA).** The calculated number that represents a student's average grade. This number is typically between 0 and 4.00 with an A grade represented by 4 points and an F grade represented by 0 points. For the purpose of this study, the Overall GPA use was the last semester of the freshman year of high school and the first semester of the sophomore year of high school.

**Struggling Student.** A term utilized by the researcher to represent students who face significant academic struggles that represent periodic failing grades or low grades that barely allow them to graduate with a high school diploma.

**Transition Year.** This term refers to the first year in a new school system. Typically the first year of middle school or junior high, or the first year of high school. Depending on the school district this will be either 9th or 10th grade. The schools in this study have a 10th grade transition year.

## Significance of the Study

The more recent work of Schwartz, Rhodes, Spencer, and Grossman (2013) builds on the foundational studies of researchers DuBois, Sipe, Slicker, and Royce conducted in the 1990's regarding the impact of mentoring by adults to school-age students. Collectively, these researchers examined the work of non-educators serving as mentors to at-risk students in an outside organization such as the Big Brothers and Big Sisters Program (Schwartz et al., 2013). The review of literature shows that many of these programs struggled with consistent access to students and continuity in mentors, both of which served to compromise the effectiveness of the programs. In addition, the studies did not focus on middle-class students who were not finding success in their transitional year into high school which is the setting for this study (Black, Grenard, Sussman, & Rohrbach, 2010; Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Haddad, Chen, & Greenberger, 2011; McQuillin, Smith, & Strait, 2011; Radcliffe & Bos, 2011; Slicker & Palmer, 1993).

This study explored the effectiveness of a mentoring program, as measured by academic grades, using teachers as mentors that intervened quickly and throughout the first semester of the transition year into high school. The literature review explored the challenges

of transition years and importance of quality academic programs helping students from success in high school. It then proceeded to look at the characteristics and indicators of struggling students and finally narrowing in on mentoring programs that seek to utilize the knowledge gathered by the aforementioned themes in aiding youth to be more successful.

The teachers interacted as *invisible mentors*, meaning that the students did not know that they had been assigned a mentor. Research has shown positive effects when students have natural forming mentors (Beam et al., 2002; Haddad, Chen, & Greenberger, 2011; Liang, Spencer, Brogan, & Corral, 2008). These relationships, characterized by high support and minimal conflict, are increased in value as the mentor and mentee have a common goal (Beam et al., 2002). This research study has the potential of providing assistance to not only the incoming cohort of students as their grades improve but to all high school educators searching to find a relational model that provides practical help to their struggling students. Additionally, the findings of this investigation add to the empirical body of knowledge in the field of mentoring. These results are influential in comprehending the impacts of such programs on the successful completion of a valuable high school education.

**Overview of Research Methods**

This study was employed using a quantitative research approach of quasi-experimental design (Creswell, 2015). Using the same parameters and methods, 31 students, at three demographically similar high schools in a Pacific Northwest state in the same suburban school district were identified as struggling in their transition to high school. Student subjects identified in one of the high schools received an *invisible mentor*. The student subjects identified at the other two high schools served as control groups and did not receive an assigned *invisible mentor*. The study measured the degree of association (or

relation) between the frequency of mentoring interactions, the type of mentoring interactions, and academic achievement, in terms of overall GPA and core GPA, of the struggling students.

The students were identified 12-15 days into the school year by certificated teachers input on behavior, attendance, skills, and effort. Additionally, administrators reviewed the previous year academic data from the student management system to assist in identifying the selected students. Academic data was gathered from grades represented on the school districts semester report grades.

Volunteers, all teachers, from the one suburban high school received training on effective ways to build and utilize a coaching/mentoring relationship with their identified mentee. The training also provided mentors with education on building appropriate and natural relationships with their mentee and who to contact if they no longer wanted to be a part of the study. Student subjects chosen for the mentor were not enrolled in the mentor's classes, clubs, or athletic teams. The goal was to introduce an additional caring adult, an *invisible mentor,* into the environment of the struggling student and assist the student successfully navigating the transition to high school. All the student subjects participating in the study had parental/guardian consent prior to taking part in a mentoring program.

The change in grade point average (GPA) from the struggling students' previous semester and their first semester in high school was analyzed utilizing a 2-sample t-test to conduct within-groups analysis with the aim of minimizing any differences that existed in the groups from the different high schools and thereby determine the probability that the difference in GPA is statistically significant (Tanner, 2012). Additional data was collected from the mentors by use of an e-mail check-in five times throughout the semester that asked

for the quantity and type of interactions they had with their mentee since the previous e-mail from the research assistant.

# Chapter II

## The Literature Review

### Introduction

Historically, the mentor-mentee relationship has impacted schools and the workplace (Beam et al., 2002; DuBois et al., 2002; Eby, Allen, Evans, Ng, & DuBois, 2008; Haddad et al., 2011; Hamilton et al., 2006; Liang et al., 2008; Rhodes et al., 2000). Mentorships have formed naturally or through structured programs, as people have shared common goals and a desire to be of service to those striving for such goals. Studying the impact and effectiveness of mentor-mentee relationships has only recently begun and often is marred by the assumption of its 'goodness' as well as by the varied methods, goals, and mentor-types used in programs (Karcher, Kuperminc, Portwood, Sipe, & Taylor, 2006). The review of literature will provide the foundational groundwork for the study of the *invisible mentoring* program for struggling students transitioning to high school. It is also of value to look at the impact of natural forming mentors as a simulation of this studies use of the term '*invisible mentor*'; one where the student is unaware that the adult is assigned to encourage, motivate, and coach the student however reasonably possible.

Educators continue to seek understanding of four main pillars of information critical in the profession: 1) the circumstances that lead to success in programs for at-risk youth, 2) how to reinforce and clarify the value of a rigorous education to all students, 3) what attributes need to be cultivated and/or taught to maximize the probability of future success, and finally, 4) what researchers have learned about the mentoring programs that have been established to facilitate such success (Grossman et al., 2012; Rhodes et al., 2000; Royse, 1998; Schwartz et al., 2013).

This chapter's analysis of the literature provides greater understanding of mentoring programs within the high school years by first looking at the critical nature of the first year of high school, which will be called the transition year whether it be the ninth or tenth grade in an individual school system. The review will then focus on overall barriers to post-high school success for individuals whose academic struggles result in a failure to graduate, a low grade point average at graduation, or failure to engage in quality educational programs. The chapter then proceeds to identifying characteristics and traits that predict at-risk and/or struggling student status in high school. The final section gives a review of the various types of mentoring programs aimed at providing services to at-risk and struggling students. This progression is represented in Figure 1.

Figure 1. Literature Review Progression


**Challenges of Transitioning into High School**

Psychosocial and behavioral factors are often equal to prior academic performance in predicting high school grade point average (GPA), thereby suggesting that it is important for the education community to address the emotional and transitional challenges of students moving into their high school years (Benner & Graham, 2009; Casillas et al., 2012). Due to the varied grade-level structures of the secondary schools, this transitional year may be the ninth grade as the students move up from middle school or the tenth grade in a school district utilizing a junior

high model. In either situation, it is the first year in a new school, the transitional year, which is the critical focus (Benner & Graham, 2009; Casillas et al., 2012).

The transition year into high school is typically associated with a decrease in grade point average and an increase in the number of absences (Akos & Galassi, 2004; Benner & Graham, 2009; Letrello & Miles, 2003; Newman et al., 2007). In a study designed to document the transition from middle school to high school for successful students, data was collected over a four-year time period of nearly 2,000 students who had received grades of C or better in middle school and examined academic and psychological information up through tenth grade (Benner & Graham, 2009). After compiling student perceptions of school climate, semester grades and attendance data, the average GPA and attendance rate decreased starting at ninth grade after holding steady throughout seventh and eighth grade. The grade point average declined from a 2.4 in eighth grade to 2.1 in tenth grade, while the number of absences per semester increased from five days to nearly 12 days (Benner & Graham, 2009). A decline in achievement, as measured by semester grades, is commonly viewed as typical and attributed to the change in school structure and environment (Benner & Graham, 2009; Ding, 2008; Schwerdt & West, 2013)

The student grade point average (GPA) is a critical piece of data in predicting future success in high school and beyond when examining on-time graduation, access to rigorous courses in math and/or science, and post-high school opportunities (Pharris-Ciurej, Hirschman, & Willhoft, 2012; Schneider, Swanson, & Riegle-Crumb, 1997). Additional research that addressed the importance of early high school success utilized the data collected from the National Education Longitudinal Study of 1988-94 (NELS: 88-94). This data allowed the inspection of the sequencing of math and science courses throughout high school to determine

the long-term impact of different course loads. Consistently, the ninth and tenth grade was reported to be the most critical year for success, as measured by grades of C+ and higher, and a predictor of successful completion of courses in the senior year (Chase et al., 2014; Schneider et al., 1997).

Continuing with the goal of a successful transition to high school, The New York City public schools adopted an initiative in the 2010-2011 school year to improve the success of students as they entered high school by making available tutors, group discussions, and field trips to ninth graders in 37 different public schools (Russell, Mielke, Palmiter, Turner, & Vaden, 2012). Data, gathered from youth surveys, participation numbers, and performance data in attendance and credit accrual, showed such interventions led to increased credit acquisition and improved attendance rates when compared to those who did not take advantage of the same services. Research concludes that there is a strong correlation between passing grades and the importance of informal one-on-one interactions with staff during the program (Allensworth & Easton, 2007; MacLeod, 2016; Russell et al., 2012).

**Barriers to Future Success**

Beyond the goal of graduating from high school is the need for a quality education in a rigorous, appropriate course of study (Ackerman et al., 2013; Carnevale, 2008; Sawyer, 2013). Additionally, in a finding that highlights the importance of doing well in classes, and not just aiming to pass, Allensworth and Easton (2007) discovered that if the number of failing grades is the same, then the students with the higher grade point average had an increased chance of successful graduation. The study, conducted in the Chicago Public Schools, discovered that the biggest drop in high school graduation rates occurs for students who achieved below a 2.00 GPA in their freshman year of high school. Students with a 2.00 GPA or higher graduated at a rate of

72% or greater, while this dropped to 53% or lower for students with freshman GPA's below this 2.00 mark (Allensworth & Easton, 2007).

Low grades, and associated minimal effort and motivation form a barrier to the rigorous courses available to students in high school (Ackerman & Kanfer, 2012; Allensworth & Easton, 2007; Bragg, Kim, & Rubin, 2005). A four-year longitudinal study explored the impact of early high school grades, effort, motivation, and goals on the enrollment of students in Advanced Placement or college-credit courses as well as on the final knowledge acquisition and grade point average of high school graduates (Ackerman & Kanfer, 2012). Data was collected annually from suburban high schools in the southern region of the United States by utilizing parent surveys and academic data. The grades from the first year in high school, combined with reported effort and the presence of goals, predicted grade point average throughout the remainder of high school and accounted for 54% of the variance in the number of Advanced Placement/college-credit course taken by juniors and seniors (Ackerman & Kanfer, 2012). Ninth grade ability and academic self-concept accounted for 18% of the variance when comparing the change in grade point average between ninth grade and senior year (Ackerman & Kanfer, 2012).

Seeking a deeper understanding of effective rigorous programs through the review of state agency documents and follow-up interviews, Bragg, Kim, and Rubin (2005) explored the presence and utilization of college prep programs across the United States. Advanced Placement, Dual-Credit courses, and Tech or College-Tech prep programs are the only three programs that exist, in all 50 states, to aid high school students in enhancing their preparation for college. Bridge programs (summer time only), College-Level Examination program, virtual schools, early or middle college high schools, General Education Development bridging to college settings, and International Baccalaureate are six additional programs that have a

substantial presence in America (Bragg et al., 2005; Teirney, Corwin, & Colyar, 2005; Venezia & Jaeger, 2013). All nine programs, and many smaller programs found in some states are overwhelmingly accessed by students that have strong academic success, as measured by course grades, in the ninth and/or tenth grades (Bragg et al., 2005; Hertberg-Davis & Callahan, 2008).

The grades of specific courses taken in the early, transitional years of high school are shown to have greater predictive value for graduation success as well as the enrollment of students into a 4-year university (Long, Conger, & Iatarola, 2012). Researchers reviewed and analyzed the data provided by the Florida State on the public high school graduates of the 2004 school year to identify the effects of ninth and tenth grade course selection on graduation rates and acceptance into post-high school educational institutions. At the broadest scope, the higher level math, science, and Advanced Placement/IB courses, the higher the enrollment into 4-year universities, and consequently lesser enrollment into 2-year colleges. If the goal is to look at the attainment of a high school diploma, the success level of tenth grade math and foreign language had the strongest impact on graduating from high school. Whereas English and social studies success had no predictive ability on graduation from high school, each level a student successful masters in ninth or tenth grade improves the likelihood of graduation by three percent and enrollment in a university by six percent. Additionally, in looking at the number of classes taken by high school students in non-academic courses, it was concluded that the increased number of elective course improved the likelihood of graduating from high school while at the same time decreasing the probability of enrolling in a 4-year university (Long et al., 2012)

Rose and Betts (2004) added to the research base focused on the importance of mathematics education as a predictor of future financial earnings by looking at the types of math classes taken in high school as opposed to the traditional look at the number of years of math

taken. A strong correlation was discovered between the level of math completed in high school and how much money individuals earned roughly ten years beyond high school (Rose & Betts, 2004). Additionally, the most impactful level of math reached by high school students is successful completion of Geometry as compared to the lower levels of applied mathematics and/or pre-algebra. The impact of attaining the level of Geometry remains consistent regardless of demographics, family educational levels, and school characteristics whereas the initial value of progressing through Pre-Calculus and Calculus do not have the same level of impact on future earnings when mitigating for the same demographic, family and school characteristics (Rose & Betts, 2004).

The urgency to support students in the attainment of higher level of academic success in the transition years not only helps grade point average and access to the valuable rigorous course of study but can even impact the likelihood of future earnings and college success (Clark & Martorell, 2014; Geiser & Santelices, 2007). Recent studies have been conducted investigating whether there are any earning differences ten years after high school between students who barely obtained a high school diploma and those who were credits shy of earning a high school diploma (Clark and Martorell, 2014). Students who re-took their exit exam, originally administered during their tenth grade year, were believed to represent a similar population of individuals who had struggled academically through school and yet had remained in attendance into their senior year. The future earnings of those who passed this last-chance exam attempt were compared to those who failed this similar final attempt (Clark and Martorell, 2014). The adult workers who barely obtained their high school diploma did not demonstrate any significant difference in income, or college enrollment beyond one year, as compared to their counterparts who had barely failed to graduate from high school, thus suggesting that there is no value to a

high school diploma if it is gained by the slimmest of margins (Clark & Martorell, 2014; Jepsen, Mueser, & Troske, 2016).

Furthermore, data acquired from the University of California data base was analyzed in an effort to compare the predicting power of high school grade point average (GPA) and standardized tests such as Scholastic Aptitude Test (SAT) and American College Test (ACT) on academic success in college (Geiser & Santelices, 2007). In addition to overall college GPA, student success in individual programs within the university setting was explored over the four years of attendance at the University of California. High school grades proved to be the best and most consistent predictor of not only freshman grades in college, but also in the completion of college degrees and cumulative GPA (Geiser & Santelices, 2007). This data remained consistent on all campuses of the University of California institution and for each cohort across all academic disciplines (Geiser & Santelices, 2007). This data contradicts that standardized tests are a more reliable source of college success because of the static nature unaffected by the wide range of grading policies present on high school campuses (Burton & Ramist, 2001; Camara & Echternacht, 2000; Geiser & Santelices, 2007).

Researchers continue to explore the current educational and political push for all American schools to prepare each and every student for entrance into college (Carnevale, 2008; Ford, Kwakye, Hui, & Oreopoulos, 2016; Venezia & Jaeger, 2013). The current goal for all students to obtain a college education matches the merit-based philosophy and individualism that fits into the American philosophy that has threaded its way through history (Carnevale, 2008). On a practical level, the need for increased number of college graduates addresses several factors such as 1) an increased shift in our economy towards white collar and office jobs that require post-high school education, 2) increased monetary compensation for workers that have college

degrees compared to high school diplomas only, 3) and employers need workers that know how to learn and adjust and they can use colleges as a de facto apprenticeship program (Carnevale, 2008; Ford et al., 2016).

The above literature highlights the importance of not just a high school diploma, but a quality education as measured by rigorous core classes and good grades (Ackerman et al., 2013; Carnevale, 2008; Sawyer, 2013). Low grades, representing poor academic achievement, are a barrier to future success. There is a needed sense of urgency to support struggling students early in their high school years (Camara & Echternacht, 2000; Clark & Martorell, 2014; Geiser & Santelices, 2007; Jepsen, Mueser, & Troske, 2016; Schwerdt & West, 2013).

**Early characteristics and traits of struggling students**

The term "at-risk" is defined as adolescents struggling to be academically successful within a tradition secondary school (Battin-Pearson et al., 2000; Dynarski et al., 2008). The students exhibit grades and behavior that puts them "at-risk" for not graduating on time (Wang & Fredricks, 2014). Typically, students will exhibit an increasing reluctance to engage in academic activities that lead will then lead to non-attendance patterns and/or behavior that is disruptive to the educational environment (Fredricks & McColskey, 2012). Early recognition of the characteristics of "at-risk" students allow educators to intervene early with strategies that will remove the possibility of non-graduation from high school and help the struggling student to grow in motivation and academic achievement (MacLeod, 2016; Wery & Thomson, 2013)

With this specific definition in mind, Lemon and Watson (2011) studied 177 volunteer students in a mid-sized high school to examine the relationships between various characteristics and how they might relate to the early prediction of dropping out of high school. At-risk status, as measured by questionnaires and grades, also was analyzed among this same group of 14-18

year old students. The results demonstrated a strong correlation between wellness, stress, and mattering as it relates to the status of being at-risk for success in school. Furthermore, this increased the odds of these students dropping out of school. The teenagers who scored low in wellness and mattering, as well as reporting high levels of stress, led to the labeling of at-risk. Such findings should encourage schools to counteract these tendencies by increased promotion of coping skills, highlighting the purpose students' current learning has for future years, and nurture compassion for others (Hawkins, Jaccard, & Needle, 2013; Lemon & Watson, 2011).

The results of the previous quantitative study were reinforced with the narrative stories brought forth in qualitative research. Using multiple interviews aimed at getting high school dropouts to describe their experiences, as opposed to talking about their high school events, Schulz and Rubel (2011) explored the various consistent factors that presented in five students who failed to graduate from high school. The boys all claimed to be alienated from their peers and marginalized in their schools. The overarching and reoccurring themes of the students' experiences fit into the categories of 1) belonging, 2) trust, and 3) self-worth. Each student expressed the need, regardless of their misbehaviors, to build relationships with peers and adults (Schulz & Rubel, 2011).

Outside of the relational and social dynamics of high school years, it is valuable to explore other factors that have an impact on a quality secondary education. Hickman and Wright (2011) conducted a quantitative study with 447 students in the Cincinnati Public School System to look at the predictive value of academic and behavioral variables, regarding completion of high school. The results of the ten-year study showed several significant trends for this cohort of students. The younger the age of the student identified as at-risk, utilizing GPA, proficiency tests, grade retention, and expulsion date, the lower the percentage of that student graduating

with only a 67% graduation rate. When these struggling students entered a support system utilizing an adult mentor, researchers found that the earlier the student was identified as "at-risk" by these same factors, the less effective the mentoring intervention. Interestingly, if the student demonstrated a higher grade point average, they demonstrated a significantly stronger attachment to the school (Hickman & Wright, 2011).

The previous results supported a prior study by Boon (2008) analyzing over 1000, 12-15 year-olds, that shed some clarity on whether traditional at-risk factors or poor behavior had a more likely impact on the failure to graduate from high school. Family income, single parent homes, and ethnic minority status have statistically been traits that would label students as at-risk for academic success. These traditional predictors of non-graduation were compared to the impact on graduation of bad school behavior, as measured by school suspensions. The data gained by questionnaires distributed to students in the middle of the year seemed to show that challenging, bad behavior better predicted non-graduation over whether the student happened to come from a low-income home, a single-parent home, or a traditionally underperforming ethnic group (Boon, 2008).

Continuing to look at prior research, Battin-Pearson et al. (2000) utilized data from a five-year longitudinal study to determine the most powerful predictor of high school dropout. From a beginning population of 808 ten-year-olds, to the final sampling of 770 students still participating five years later, the key theories of Academic struggles, general deviant behavior, deviant peer-groups, poor family socialization, and the multi-faceted structural strains theory were analyzed. Researchers concluded that academic struggles were the only independent variable that is a significant predictor of a student failing to graduate from high school with the other four factors having negligible impact on their own (Battin-Pearson et al., 2000). When

combined with low academic marks, deviance, anti-social peers and low family economic status did show to increase the likelihood of dropping out of school by the end of tenth grade (Battin-Pearson et al., 2000).

Similarly, Rumberger and Larson (1998) reviewed the data collected from the National Education Longitudinal Survey of 1988 (NELS:88) with an eye on the variables of the mobility of secondary students and high school completion. Mobility consisted of changing schools and also changing residences. The NELS:88 was a longitudinal study that took baseline surveys in 1988 with follow-up surveys with the same students in 1990, 1992, and 1994. It was discovered that 25% of all students made a school change between 8-12$^{th}$ grade (with 33% of them not changing residences), and conversely, 33% made residential changes during the same grade span (with 50% of them did not change schools). All the above incidences increase the lower the socio-economic status of the family, and in each case, there is a significant correlation with school performance. Specifically, the more incidences of mobility, whether of school or residence, within the high school years then the lower the likelihood of graduation. To limit mobility, and thus increase the odds of graduation, the study identified the following predictors of mobility that schools should try to reduce: 1) excessive absences, 2) misbehavior, and 3) low education expectations (Rumberger & Larson, 1998).

The existence of struggling students is evident in our secondary schools and the ability to identify them at an early age is not only possible but imperative (Battin-Pearson et al., 2000; Hickman & Wright, 2011; MacLeod, 2016). The failure to intervene with relief has a lasting impact on academic success, access to a needed rigorous high school curriculum, and therefore limits the likelihood of success in post-high school goals (Boon, 2008; Clark & Martorell, 2014; Lemon & Watson, 2011; Wang & Fredricks, 2014).

**Mentoring programs**

Mentoring programs began to expand in America's school system during the 1970's as an attempt to build relationships between adults and students with an assumption that it would enhance the culture of schools and perhaps the academic achievement of students (DuBois et al., 2002; Sipe & Roder, 1999). The review of the research of specific mentoring programs involves a variety of age groups of both mentors and mentees. Perhaps the most prolific of recent researcher in the field of mentoring is by David L. DuBois.

DuBois et al. (2002) looked at nearly 30 years of research studies, which focused on the effects of mentoring on youth. They limited their scope to one-on-one mentoring methods while excluding peer-tutoring. In all, they did a meta-analysis of 55 studies between the year of 1970-1998 that encompassed a variety of settings and population. Within these same research projects, the researchers also looked at the effect program design, youth attributes, quality of mentor-mentee relationships, and issues of assessment had on the effectiveness of the mentoring program (DuBois et al., 2002).

Overall, only modest gains were found when mentoring programs involved average youth (not at-risk for academic struggles) while, as long as the implementation was sound, the positive impact on students struggling to be successful in school was more pronounced (DuBois et al., 2002). The use of "best practices" proved critical with five prominent categories coming to light in the 55 studies: ongoing mentor training, frequent contact, support for needs that arise, parent involvement, and implementation monitoring. These modest gains among average youth held true across multiple variations of the mentoring programs with the significant importance found in some mentor characteristics and the quality of the relationship that was forged between the

mentor and mentee. The younger the teenager could obtain a mentor, and if the contact could evolve into a positive bond that lasted at least one academic year, the more likely that academic and social gains would be achieved (DuBois et al., 2002).

The design and methodology of a study has the potential to impact the results. Thus DuBois, Doolittle, Yates, Silverthorn, and Tebes (2006) took an in-depth look at the status of methodology used in research conducted on youth mentoring. They looked at the previous years and trends in research methodology used by looking at three distinct phases: Pre-intervention Research, Intervention Research, and Preventive Service System Research. Prior to analyzing the planned intervention (mentoring in this case), researchers site a lack of consistency and fidelity in the pre-intervention phase of the studies. This would fall into the categories of sampling, design, assessment, data analysis, and then finally monitoring of the study that should be present in all basic research. There is a lack of attention to details and consistency likely due to the casual and relational nature of mentoring itself (DuBois et al., 2006).

Continuing to take a broad perspective on the impact of mentoring on youth, DuBois, Portillo, Rhodes, Silverthorn, and Valentine (2011) conducted a meta-analysis of 73 independent evaluations of mentoring programs over the time period of 1999 to 2010 with the aim of determining the overall effectiveness of mentoring programs for youths. Their study supported the findings that over a wide array of program designs mentoring improved behavior, social and emotional interactions with peers, and academic performance. These same studies showed that mentoring is flexible enough in nature to serve as a promoter of positive behaviors and prevention from detrimental habits while working with mentees of all ages. Although effective in an overall application, youth mentoring programs showed stronger success with students previously identified as struggling in some measurable category, while utilizing mentors that had

a strong connection to the targets of the study, and when there was trained and supported mentors (DuBois et al., 2011).

Looking to categorize the major impacts from over 20 years of mentoring programs for youth, a meta-analysis of 116 studies revealed positive influences on the behavior, attitudes, health, interpersonal relationship, and career outcomes for mentees (Eby et al., 2008). Table 1 below shows these and additional sub-categories of this study.

Table 1

*Five major impacts of quality mentoring programs*

| **Five major impacts of quality mentoring programs** | | | | |
|---|---|---|---|---|
| Behavior | Attitudes | Health | Interpersonal Relationships | Career Outcomes |
| **Sub-categories most influenced from mentoring relationships** | | | | |
| Helpfulness | School and Career Attitudes | Career Outcomes | | |
| **Sub-categories least influenced from mentoring relationships** | | | | |
| Deviant Behavior | Stress | Self-perception | | |

Note: adapted from Eby et al. (2008)

Regardless of the initial focus of the mentoring relationship, mentoring demonstrated a positive, significant impact. The conclusion of the analysis and application of the positive impacts of mentoring called for educational institutions to utilize mentoring programs to improve students' attitude towards school and involvement in general, and more specifically to facilitate improved academic performance (Eby et al., 2008).

Continuing to look at the effectiveness of mentoring, 46 studies over 40 years involving youth delinquency behaviors were reviewed and mentoring was found to have a preventative effect on individual delinquent behavior such as aggression, drug use, and poor academic

behavior (Tolan, Henry, Schoeny, Lovegrove, & Nichols, 2014). Entitled The Campbell Collaboration Review, the researchers focused in on studies from 1970-2011 that utilized random assignment and/or a strong quasi-experimental design. The majority of the studies focused in on the effect of mentoring on academic achievement and/or delinquency with the youth mentoring program having a significant effect on both (Tolan et al., 2014).

Within the growing number of mentoring programs throughout America, researchers sought to categorize and recognize trends. A multitude of creative programs were beginning to overtake the traditional Big Brothers Big Sisters programs, with their off-site mentoring model (Sipe & Roder, 1999). The majority of these programs fit the categorization of one-on-one mentoring with an increasing number of programs in America, 70%, being implemented on school grounds (Sipe & Roder, 1999). The demographics of the youth being served by mentoring programs in the late 1990's were as varied as our countries population with the appearance of positive result being self-reported in all arenas. An overwhelmingly positive response came in from suburban youth. Seventy-five percent of the programs that have been in operation for 10 or more years have a focus on personal development, whereas the newer programs tend to be focused on goals of an academic and career nature. This academic, school-based mentoring is correlated to an increase of training and support needed by the mentors (Sipe & Roder, 1999).

Looking more closely at a specific environment, a five-year report was published during a seven-year longitudinal study in a rural school district (Radcliffe & Bos, 2011). The 25-30 mentors would work at the school twice a week for a semester with a new group of mentors coming in each semester to work with the 50 at-risk students in activities such as goal setting, mentoring, college visits, and career investigation. The desire is to see if this model of

mentoring would improve the college-attending aspirations of the students and result in gaining acceptance into a post-secondary institution. As compared to the control group of at-risk students, the students interacting as a group with the mentors showed a greater increase in positive attitudes about attending college, an increase in their state exams, and seemed to be showing a higher level of perseverance in high school then their peers. Each of these increases are closing the gap between the Honors students who were not receiving the mentor-led college visits, tutoring, or goal-setting activities (Radcliffe & Bos, 2011).

In an attempt to look at mentoring from a unique perspective, a qualitative study of the mentoring relationship was conducted from the angle of the mentor and what he or she is perceiving and perhaps receiving from such a relationship (Philip & Hendry, 2000). By initiating group and individual interviews, the goal was to learn if there were consistent themes, regardless of the nature or origination of the mentoring relationship, as to the perceived benefits of mentoring for the mentor. The study determined that four key benefits are being sought out and perceived to being achieved by mentors: 1) helping them make sense of their own past experiences, 2) to gain insight into the realities of youth, 3) build alternative relationships, and 4) pursuing the idea of becoming a better adult (Philip & Hendry, 2000).

When measuring the quality of the mentoring relationship, there is a need to look at the duration of the relationship, frequency and consistency of contact, evidence of an emotional connection, and the mentor's approach/style (Deutsch & Spencer, 2009). For the purpose of this literature review the following types were reviewed: (a) adult mentors from outside organizations, (b) elderly mentors, and (c) mentors who are teachers at the same school as the mentees.

**Adult mentors outside of the school.** The most prevalent mentoring program in the United States that utilizes adult mentors is the Big Brothers Big Sisters Programs. As such, a common research topic is the effectiveness of these programs in terms of the improvement of academics and behaviors of the mentees, as well as the roles, genders, and behaviors of the adult mentors (Grossman et al., 2012; Herrerea, Grossman, Kauh, & McMaken, 2011; Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002; Rhodes et al., 2000; Rhodes, Lowe, Litchfield, & Walsh-Samp, 2008).

Grossman et al. (2012) performed an extensive data analysis of the 2007 and 2011 national evaluation of the ten Big Brothers Big Sisters Programs that served 71 schools in a variety of communities. The data from the 1,139 students involved were scrutinized for the impact of the length of the mentoring relationship and, if the relationship terminated, what impact losing the mentor or gaining a new mentor had on academic successes. Measurement of stress exposure and rejection sensitivity was utilized to try to see if there was a predictor of what mentoring partnerships would fail to stand the test of time. The linear and logistic analysis demonstrated that the longer the match duration then the greater likelihood of improved academic achievement. If the match lasted less than three months then there was no impact on achievement, with the greatest impact coming with intact mentoring relationships past six months. One of the conclusions reached, which seems particularly impactful for educators, was the negative impact on academic achievement of students who lost their original mentor and then received a new mentor (Grossman et al., 2012; Spencer, Basualdo-Delmonico, Walsh, & Drew, 2014; Starr, 2014 ).

Similarly, an additional study of the Big Brothers Big Sisters program collected longitudinal data from 959 urban students in the program ranging in age from 10 to 16 years old

(Rhodes et al., 2000). The mentors were volunteers of the same gender as the student and received training and given case management support. The longitudinal study lasted 18 months with surveys and data collected at the beginning and the end of this time. The adolescents' mentoring, according to the self-reported and school data, had a direct impact on improving the parental relationship, lowering the number of unexcused absences, and improving the self-efficacy in regards to their academics. Researchers determined there was not a direct causational effect of improved self-worth, school value, and/or grades by being in the mentoring program. These three areas did see some improvement due to the previously mentioned impacted factors of better rapport with parent(s), decreased truancies, and an improved sense of academic confidence (Rhodes et al., 2000).

The effectiveness of mentoring was discovered in rural areas as well as urban regions of the country (Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002). A quantitative and qualitative study of 50 mentoring relationships established through a Big Brothers Big Sisters program in a mid-western town seemed to demonstrate that the mentor efficacy belief could overcome perceived shortcomings in the closeness of the relationship and the even the amount of time spent with the adolescent. Researchers found evidence that the mentors' conviction of being able to make a difference in the academic achievement and decision making of the youth could be greatly enhanced by structured training and support. In the absence of mentor efficacy, increased contact time proved to be the critical element, over relationship experiences and relationship closeness, that lead to both the mentor and mentee feeling as though the relationship was beneficial and worth continuing (Gettings & Wilson, 2014; Parra et al., 2002).

Broadening the scope of the mentoring program, while remaining focused on academic achievement, an 18-month study of 1,139 students was evaluated with half of the students

composing a control group with the aim of determining the effectiveness of a Big Brother Big Sisters school-based mentoring program that encompassed 71 schools in ten cities (Herrera, Grossman, Kauh, & McMaken, 2011). In addition to information gained by surveys given at four different points in time, academic data was collected concerning their success in science and social studies. The study was wide-ranging in age, 9-16 years, and incorporated mentors from various levels of education. This mentoring program consistently showed the mentored students to demonstrate improved positive academic perception and more likely to claim having a "special adult" at school as compared to the control group. Academic gains were noted at the end of one school year, but these gains did not continue through to the end of the 18-month study. Researchers cite that mentoring failed to consistently show improved classroom effort, relationships with teachers or parents, or improve problem behavior. The lack of consistency, variation in the age and training of mentors, and the fact that over half of the students changed schools midway in the study could explain the initial positive results, but the lack of continuation (Herrera et al., 2011).

While continuing to look at the Big Brother Big Sisters program, researchers studied the role of gender in youth mentoring (Rhodes, Lowe, Litchfield, & Walsh-Samp, 2008). This study involved 1,138 10-14 year olds who were given the Inventory of Parent & Peer Attachment (IPPA) to assess their communication, trust level, and alienation with their parents and peers. These adolescents, 63% of them male, came from a diverse racial background but over 90% of them came from single parent homes. At the outset of the program, 18 months before the second IPPA data collection, the girls in the program reported a lower level of trust and higher level of alienation from parents and peers than their male peers. The results of the study consistently saw the female mentoring relationships lasting longer than the boys and with a higher reported

satisfaction in the relationship then any of the boys' relationships or shorter-lived girls mentoring relationships. These longer female mentoring relationships demonstrated a strong correlation between a satisfying mentoring relationship and improved trust and communication with parents. Rhodes et al. (2008) cited several limitations in the study namely the age of the data (from 1998), the limited age-range of the mentees, and the fact that it applied only to the demographics of kids from single-parent homes involved in a specific program.

Kanchewa, Rhodes, Schwartz, and Olsho (2014) conducted a quantitative study aimed at measuring the value of same-gender mentoring relationships by specifically looking at measures of length and intensity of the relationships and whether the gender of the mentor impacted the academic outcomes for the mentee. Over 90% of the students referred by schools, and then involved in the Department of Education's Student Mentoring Program and the Big Brothers Big Sisters of America School-based Mentoring, were boys which forced this study to look at whether there were any significant differences in the nature and results of mentoring relationships composed of same or different genders. This study found no significant difference between the nature and effectiveness of the mentoring relationships based on whether the boys had male or female mentors (Kanchewa et al., 2014). This contradicts decades of anecdotal concerns that males needed older male modeling as a critical component of an effective mentoring model. This study can serve a practical application of relieving the need to find male mentors, which are a scarcity compared to female volunteer mentors, as well as a deeper realization that quality mentoring is about common goals and interests and less about the gender of the individuals (Fruiht & Wray-Lake, 2013; Kanchewa et al., 2014).

Focusing on a different type of youth program, yet one that still utilized adult mentors outside of a school setting, a quantitative study of a four-year project with African-American

adolescents from poverty impacted, female-headed households highlights pertinent data (Royse, 1998). The program was known as The Brothers Project. Data was collected and analyzed to determine what, if any, significant gains had been made using male mentors with this at-risk population of young boys. Data was collected in the areas of self-esteem, attitudes towards drugs and alcohol, grades, school attendance, and school discipline infractions. The quantitative analysis showed no significant difference between the control group and the intervention group receiving the mentoring. There was no clear reason for the lack of improvement and why significant gains were not made by the mentored group over the control group without mentors. Possible limiting factors could be the small amount of data on the amount of contact between mentors and mentees, no data on whether the mentee valued the relationship and time with their mentor, and the difficulty of recruiting and keeping mentors (Royse, 1998).

A unique mentoring model was investigated where the struggling teenager chose their mentor (Schwartz, Rhodes, Spencer, & Grossman, 2013). Researchers investigated the effectiveness of a new approach to working with young adolescents who have dropped out or had been removed from school called The National Guard Youth Challenge Program where the 16-18-year-old nominates mentors from among non-parental adult in their life. The data of 1,173 adolescent mentees were examined and followed up with an interview of a sub-set of 30 participants to gather additional qualitative data. Both the quantitative and qualitative data confirmed that when the relationship endured beyond a year, improvements were found in educational and occupational success although the same success was not evident in shorter pairings. The same improvement was reported in social relationships with family and peers, as well as a healthier self-concept and confidence when these mentoring relationships were enduring and with a mentor of the same race. This new approach to having the vulnerable

adolescent choose their mentor seems to have merit and warrants further implementation and study in a less intense and structured setting (Schwartz et al., 2013).

The previous studies lead to a deeper look into the impact of important non-parental adults. Characteristics of important non-parental adults (VIPs) and the outcomes of these natural mentoring relationships across the three ethnic groups of Hispanic, Asian, and European-American were studied (Haddad et al., 2011). Additionally, survey data from the same 355 students were analyzed to see if the VIPs made a unique contribution to the adolescent once the impact of similar traits found in a romantic partner or peer were taken into account. Regardless of the ethnicity of the mentee, data showed similar characteristics of the VIPs and their positive influence on self-esteem, depressive symptoms, and problem behaviors. The natural mentors were perceived by the adolescents to have a more positive psychological influence on them than parents and peers, and in many cases, even over a romantic partner. Limitations of this study appear to be evident to this researcher as there is no data on the demographic of the 355 students, but it does show the influence of natural mentors that were identified by the adolescents rather than assigned by an authority figure (Haddad et al., 2011).

Continuing to expand on the research documenting the impact of important non-parental adults in the lives of foster youth, Ahrens et al. (2011) conducted semi-structured interviews with 23 former foster youth to look for patterns of formation, quality, and duration in these critical relationships. While all the individuals spoke of the value of these important adults as they transitioned to adulthood, it was discovered that the fear of getting “burned” or “hurt” by another adult hindered the building of these relationships when the adults first entered into their sphere of influence. The former foster youth hypothesized that the critical non-parental adults had a

positive impact on them improving their grades and confidence especially as these same adults showed patience, persistence, and authentic care for them and their goals (Ahrens et al., 2011)

The natural forming relationships of non-parental mentors in the lives of high school students were investigated as all 11th graders at a Los Angeles high school were given a questionnaire (Beam et al., 2002). With the aim of discovering the nature and quality of these relationships, researchers honed in on 243 students with average achievement in school who claimed to have a very important person who acted as a mentor in their lives. Referred to as VIPs during the study, researchers sought to determine if such a relationship is typical of any teenager or whether it was limited to youth without strong parental relationship and whether there were degrees of importance to the VIPs and if so, what caused this. The analysis of the data demonstrated that the occurrence of a natural mentor was not a result of problems in the parental-child relationship, but was normative of all characteristics of adolescents and about one-half of them were extended relatives with the other half being teachers, pastors, coaches, or parents' friends. These naturally forming mentorships were varied in duration and amount of contact, but not in quality that was characterized by high support and low conflict that intensified in importance to both parties as they focused on a mutual goal (Beam et al., 2002).

Continuing the look at naturally forming mentors, Liang et al. (2008) conducted a qualitative research study utilizing focus groups engaged in the description of relational experiences with natural mentors. Using semi-structured discussions researchers sought to identify common characteristics of natural mentors across the age groups of middle school, high school, and college and how do they compare across this decade. All three age groups discussed the critical components of time spent with the mentor around a shared activity, the building of trust and fidelity, and how the mentor proved to be an effective role model for the student.

Natural mentors also found ways to empower their younger mentee as they found the appropriate balance of connection and autonomy depending on the age of the student. Liang et al. (2008) summarized their qualitative study calling for more research that would show the relative importance of these common characteristics, but never the less highlight the value of fostering close, enduring, and trust-filled mentoring relationships that seem to function best when focused on a common interest.

**Elderly mentors.** A relatively new area of study is the impact of mentors 55 years of age and older. Mano (2007) launched a quantitative study, utilizing the analysis of covariance, to determine the impact of using elderly mentors with at-risk middle school students as they met two to three hours per week for one calendar year. The students were place randomly in three groups: a control group, a group that participated in the Positive Youth Development Curriculum and performed a community service project two hours a week, and a final group that joined the second group, but with the additional element of a mentor that they met with for two plus hours each week. The results showed that both groups showed significant advantages over the control group in individual growth as measured by the pre and post questionnaires, but the greatest growth was noted by the third group that had the mentors. When measuring self-reported attitudes regarding academics, their future, community service, and their elders, the adolescents with elderly mentors showed significant growth as compared to their peers (Mano, 2007).

A more recent review of the positives of intergenerational mentoring supported the Mano (2007) findings that demonstrated advantages for both the elderly mentors as well as the teen mentees (Thompson, 2014). Increased attendance and success in school have been consistent results for the teenage students along with the additional side benefits of relationship

development with youth peers and an improved perception of elderly in our society (Taylor, 2007; Taylor & Bressler, 2000).

**Teachers as mentors.** There are some practical reasons to explore the use of teachers at the same school as the students. Regular contact during the week, committed interest in the students' success, and the fact that the likelihood of the pairing lasting beyond a year, are some of the advantages (Hamilton et al., 2006; Slicker & Palmer, 1993). A teacher-as-mentor model can combine some of the positive aspects of the previous models of mentors because teachers could be "elderly" and/or could be chosen by the student themselves (Hamilton et al., 2006).

The educational attainment of 32 at-risk students was studied in a large suburban school district in Texas who had yearlong mentors assigned to designated students (Slicker & Palmer, 1993). The 32 mentors, all teachers in the district, received one hour of training and a handout of mentoring activities. The teachers then chose a student from the experimental group. They were given a copy of the student's schedule, asked to have 3+ meetings per week, recognize improvement in effort and grades, and serve as a role model for conflict resolution, behavior, and attitude. After six months, researchers saw no improvement in the GPA of the mentored group and no reduction in the drop-out rate in the mentored group. The controlled group of students, who never had a tutor, were the ones who demonstrated an improved self-concept of themselves as competent students. Only 22 of the original 32 mentored students remained in the comprehensive high school, and after analysis were divided into two groups: nine effectively mentored students and 13 ineffectively mentored students. The same group of researchers collected additional data the following year, and 100% of the nine effectively mentored students had stayed in school while only 69% of the poorly mentored students were enrolled in school the

future year. Seventy-four percent of the control group, who were never given a mentor, returned the following year (Slicker & Palmer, 1993).

**Conclusion**

In conclusion, multiple theories supporting the positive impact that mentoring has for all of students exists (Britner, Balcazar, Blechman, Blinn-Pike, & Larose, 2006). Collectively, research shows that mentoring of students improves relationships with other peers and adults in their lives. Thus, leading to fewer discipline issues and a greater sense of belonging, improved attendance, and increased involvement in school (DuBois et al., 2002; DuBois et al., 2011; Eby et al., 2008; Herrera et al., 2011; Taylor, 2007; Tolan et al., 2014 ). These factors were viewed as positive traits that would lead to higher graduation rates (Britner et al., 2006; Radcliffe & Bos, 2011; Rhodes et al., 2000).

The review of extensive research studies on mentoring programs have left more questions than definitive results (DuBois et al., 2002; Karcher et al., 2006), Research has found a shortage of common definitions and a lack of clarity of goals as it relates to developmental gains versus instrumental gains. Developmental gains refer to the growth of social and decision making skills, whereas instrumental gains look at specific quantifiable goals for the mentoring, usually in the realm of grades or attendance (Karcher et al., 2006). Although the amount of diversity in the settings and methods used by many mentoring research studies could be viewed as a positive, a negative challenge of being able to find reproducible results exists (Karcher et al., 2006; Rhodes & DuBois, 2006; Wheeler, Keller, & DuBois, 2010).

The profile analysis of 1,139 fourth through ninth graders who were involved in Big Brothers/Big Sisters mentoring programs allowed researcher to separate individuals into distinct

profiles based on their self-reported relationship profiles with the adults in their lives (Schwartz, Rhodes, Chan, & Herrera, 2011). The profiles were those with strong negative perceptions about the relationships in their lives, satisfactory relationships in their lives, and finally, those who cited strong positive relationships with the adults in their lives. The academic, behavioral, and attitude results were consistently the highest in the profiled group that reported satisfactory relationships with the adults in their live prior to beginning a mentoring program. Those with strong negative relational relationships saw little to no change in mentoring outcomes except for school truancy. The profile of students that reported strong positive relationships with adults in their lives saw no lasting benefits from the mentoring relationship (Schwartz et al., 2011). These results lead this researcher to suspect that mentoring for students transitioning to high school may be most effective with those students who do not exhibit the most extreme risk behaviors, but rather middle of the pack students who are experiencing slight, but important, struggles in beginning their high school career.

The influence of natural forming mentoring relationships that were formed between staff members and teenage students was measured by surveys given to 3,320 participants (Black, Grenard, Sussman, & Rohrback, 2010). The quantitative study, which spanned eight diverse states, looked at the influence on school attachment and adolescent risk behaviors such as substance use and violent behaviors. The results of the study demonstrated that the stronger the reported bond with a mentor that was formed with a staff member the more likely the student was to demonstrate and report back a positive and significant attachment to their school (Black et al., 2010). This positive correlation tends to support the value of staff members at a secondary school investing in building coaching style relationships with students at their school.

The classroom proves to be a natural place for lasting mentoring relationships to occur (Hamilton et al., 2006). School did not have barriers found present in the other settings of transportation, planning outings, and having mentors that had the desire to help, but lacked the training, resources, and/or support (Hamilton et al., 2006; Herrera & Karcher, 2013). The transition to high school presents a challenge, and many students need assistance gaining access to quality, rigorous education (Casillas et al., 2012; Clark & Martorell, 2014; Sawyer, 2013).

# Chapter III

## Design and Methodology

### Introduction

Muijs (2011) speaks of key differences between qualitative and quantitative research as well as the extreme camps that exist within the proponents of either design. Rather than taking the stance that facts are hard and can be found through quantitative numbers as opposed to the narrative story telling of qualitative studies, the more valuable perspective is rather "what kind of questions are best answered by using quantitative as opposed to qualitative methods?" (Muijs, 2011, p. 6). The purpose of this study was to provide data on the very human and relational endeavor of mentoring in an effort to help high schools in suburban communities find an effective mentoring program for identified struggling high school students. The aspiration was to identify a replicable program that would provide needed mentoring support for academically struggling, transitioning high school students within the first semester of high school. In this study, the transition year was grade 10.

This dissertation may add to the empirical information on how to assist struggling students in a community that values education and overwhelmingly sees students as college bound. Specifically, this study sought to address the following questions in regards to academically struggling transitioning students at the $10^{th}$ grade level in the first semester of high school:

1) What is the impact of an *invisible mentor*, an adult teacher from the same suburban school, on the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

2) Is there a relationship between the frequency of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
3) Is there a relationship between the types of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

This chapter explains the selected research design, characteristics of the population of students involved in the study, data collected, and the rationale of the chosen analytical methods employed. Finally, although this study extended the research base on mentoring, the chapter concludes with limitations present in this research project.

**Research Design**

A quantitative research project typically involves the classic experimental design qualities that incorporate variables and treatments (Creswell, 2015). A quasi-experimental design was utilized in this quantitative study that examined the association between mentoring and academic achievement of mentees within the first semester of the first year of high school. The study investigated the relationship between two variables - the frequency and types of interactions that occurred between the *invisible mentor* and mentee and a core GPA in math, English, and science as well as overall GPA. The treatment, the introduction of an *invisible mentor*, meant that the mentored students did not know they had been assigned a mentor, approximately one month into the first semester of the first year in high school. Because mentored students were not randomly assigned to the group receiving the *invisible mentor* the study is classified as a quasi-experimental design instead of a pure experimental design (Creswell, 2015; Muijs, 2011).

Mentoring is believed to be an effective means of helping teens, but quantitative research, as opposed to narrative stories, would be of value to the existing literature on mentoring (Rhodes & Lowe, 2008). Students who received the *invisible mentor* treatment were identified by certificated teachers as students who were struggling academically and who had experienced some academic struggles, represented by some D's and/or F's, in their previous semester. The identified students were assigned an *invisible mentor* to encourage, coach, and/or guide following the first month of the first semester of high school. The students remained unaware that the *invisible mentor* had been assigned to them with the intent to simulate the power of natural-forming mentors identified by Beam et al. (2002) and Liang et al. (2008). Through their relationship with a natural-forming mentor "adolescents often have an experientially rich and interpersonally supportive environment for development" and the mentors "comprise an additional, and important, component of adolescents' lives" (Beam et al., 2002, p. 323). Students of all age groups emphasized the importance of "trust, shared activities, and role modeling" (Liang et al., 2008, p. 177) in the mentoring relationship as it formed.

The study setting was three high schools in the same suburban school district with similar demographics, given the fictional names of School M, X, and School Y. Students in School M would receive the *invisible mentor* treatment program and students in Schools X and Y would be the non-treatment control group.

In order for the treatment group mentor-mentee relationship to meet Beam et al. (2002) and Liang et al. (2008) standard of "natural forming relationships", mentored students could not know about the mentoring treatment, hence the *invisible mentor* term was coined by the researcher. The intent of this deception was to replicate the positive impact associated with natural forming mentors and to minimize the possibility that the participants might reject the

notion of having a mentor (Beam et al., 2002; Haddad, Chen, & Greenberger, 2011; Liang, Spencer, Brogan, & Corral, 2008).

*Invisible mentors* received extensive training on how to meet their mentees in a natural manner and how to not force the relationship or mentoring (Appendix H). The culture at the treatment school, School M, included teachers that interact with students who are not enrolled in their classes. The interaction typically occurred in school hallways between class time.

The goal of this study was to take advantage of this existing culture and to enrich it with the *invisible mentor* treatment standards for the identified struggling students. Additionally, safeguards were established so that the mentor or the mentee could discontinue participation in the study if either party felt uncomfortable at any point. Mentors received training on potential reasons to terminate the relationship with the student (i.e. verbal and/or physical cues that the mentee is uncomfortable, etc.) (Appendix H & I).

**Participants**

The focus of this study was on three suburban high schools, located within a ten-mile radius of one another, in the Pacific Northwest. Participants for this dissertation study included students transitioning into their first semester of high school as well as teachers at the treatment school. The student participants (n = 93) were all identified as struggling academically in their transition to a three-year suburban high school of over 1500 students.

Each of the three schools had demographics with similar free-reduced lunch rates and ethnic breakdown. All three schools share similar leadership factors as they are under the same district leadership and have building principals that are in their second or third year at that particular school. Table 2 shows the demographic data of the three schools according to the State demographic data from the year 2015.

Table 2

*Demographic Data of Participating Schools*

| Ethnicity | "School M" Experimental group | "School X" Control group #1 | "School Y" Control group #2 |
|---|---|---|---|
| **Enrollment** | 1,814 | 1,753 | 1,513 |
| **Graduation rate** | 88.9% | 87.1% | 92.9% |
| **Ethnicity** | | | |
| Caucasian | 59.5% | 67.8% | 64.2% |
| Hispanic | 14.9% | 12.9% | 13.2% |
| Asian or Pacific Islander | 7.6% | 5.8% | 5.5% |
| African American | 5.5% | 2.6% | 4.4% |
| Two or more races | 12.1% | 9.6% | 11.9% |
| **Gender** | | | |
| Male: | 51.8% | 51.7% | 50.6% |
| Female: | 48.2% | 48.3% | 49.4% |
| **Student-teacher ratio** | 1:23 | 1:23 | 1: 22 |
| **Free/reduced lunch** | 28.1% | 26.0% | 21.4% |
| Note: Adapted from the Office of Superintendent of Public Instruction [public domain; no permission needed] | | | |

Selected minor subject participants included first-time students who were enrolled at one of three suburban high schools. The researcher conducted a short face-to-face meeting with all staff members from the three selected high schools. This meeting took place 12-15 days into the start of the school year and provided an overview of the study as well as criteria/instructions for identify student participants. Thirty-one students from each high school were identified as struggling by classroom teachers at this meeting. Selection of participants was determined by using the researcher designed B.A.S.E. screening protocol which asked teachers to record the initial impression of student behavior, attendance, skill, and/or, academic effort that, if continued, would result in difficulty to earn credit. Teachers identified potential students using the B.A.S.E. guidelines (Appendix B). Officially recorded grade point averages and attendance

records were not used to identify participants. Personal experience of the researcher has found the described procedure and process to be highly reliable in the early prediction of struggling students.

Thirty-one students enrolled at School M Treatment Group who had multiple referrals under the above criteria, and had a history of academic struggles, defined as D or F grades present in multiple core classes in previous academic year, were assigned a trained mentor from their own school. Students who had missed over half of the school days were excluded from the study as well as those failing to meet the above criteria. Thirty students enrolled at School X and School Y were identified using the same criteria guidelines. Students from Schools X and Y were not assigned an *invisible mentor*, however will progress through the semester with traditional supports from their school.

Hoping to replicate the natural-forming connections referenced in the research of Beam et al. (2002) and Liang et al. (2008), the mentor was not a current teacher or coach of the mentored student subject. The goal was to serve as a caring, supportive adult to create or enhance relationships with teachers, coaches, counselors, club advisors. Adult mentors, all teachers at School M, were selected from volunteering employees. No teacher was assigned more than one student and their status as teachers gave them access to academic and attendance data for their mentee as needed. Each mentor teacher completed a training providing ideas on how to naturally meet their mentee (Appendix H). Additionally, all mentors took part in a group brainstorming discussion on strategies that might motivate high school students, and were instructed that administrators and school counselors were available for assistance and support as needed as they interacted as a mentor/caring adult for their mentee over the months of October through the end of the first semester. The *invisible mentoring* program took place for a total of 14 weeks.

Mentors were asked to have two or more contacts with their mentee each week to develop an encouraging and coaching-like relationship that aligned with apparent and/or developing challenges that the student encountered. The number and nature of their contact with their mentor were collected by e-mail every three weeks (Appendix L). The mentor was encouraged to check attendance and grades on a regular basis using the school districts data management system and made certain that their mentee was aware of any supports available to all high school students.

**Protection of human subjects and approval**.

Permission to conduct this study was obtained from the district superintendent and the principals at each of the three schools (Appendix D, E, F, & G). Human subjects review board permission and approval from Northwest Nazarene University was received in the spring of 2016 before the start of the study (Creswell, 2015), (Appendix M). All ethical standards identified by Creswell (2015), Horner and Minifie (2011), and Marshall and Rossman (2016) were followed in this study. This involved respecting the rights of participants, honoring research sites, and reporting the research fully and honestly.

The parent and/or legal guardian of each student who received an *invisible mentor* gave informed consent to allow their student to participate in this mentoring program and had the option to remove their student at any time (Appendix A). All the mentors were teachers who are bound by Chapter 181-87 WAC that ensures the privacy of the academic and behavioral data of students at the school. Additionally, all the teachers received specific training on appropriate boundaries with students (Appendix H and I). All the mentors signed an informed consent form (Appendix J) and were given regular options to opt out of the study.

A research assistant, selected based on their experience in data collection, organization, and reputation for integrity, also submitted a signed Confidentiality Agreement (Appendix K). The research assistant was utilized in the collection of data from both the mentors and from the school management system. All submitted data will be kept for three years and password protected in an electric file. Following this time period, the data will be destroyed in compliance with the Code of Federal Regulations (45CFR 46.117).

**Data Collection**

With the goal of adding quantifiable data to the human endeavor of mentoring, baseline data was collected from all participating student subjects at each of the three high schools. The grade point average from the previous academic semester was collected from the district's data management system as well as a separate core grade point average calculated using math, English and science scores; the three core classes that each student must take prior to the transition into high school in the studied school district. These courses were taken in a junior high, one semester prior to the critical transition year that was the focus of this study.

During the first semester of high school, information was gathered, every three weeks, from the mentors concerning the number and nature of the interactions with their mentee (Appendix L). This provided the researcher with the total number of interactions between the *invisible mentor* and the struggling student subject. The mentor was asked to categorize these contacts as a greeting, discussion, academic activity, or other. This same e-mail, sent out by the research assistant (Appendix K), also provided the mentor an opportunity to express concerns about the mentor/mentee relationship and/or ask questions about the study in general for the researcher's attention mid-study.

At the end of the first semester, the first semester grade point averages of all student participants at School M were collected, as well as a calculated "core" GPA for math, English and science classes. The final number of interactions and type of interactions were collected. Finally, the GPA scores from the identified struggling students at School X and Y were collected for all courses and for their core classes. An average GPA was calculated for each group of students at each high school both for total GPA and core GPA (Appendix R).

**Analytical Methods**

Creswell (2015) warns researchers and educators of the ethical dilemma involved in conducting correlational design research. Due to the vast amount of conditions that cannot be accounted for in the school setting at three different high schools, this study does not claim that the *invisible mentoring* intervention caused a change in academic achievement.

This study utilized a 2-sample t-test utilizing SPSS to compare change in GPA between the treatment group and control groups with the aim of identifying any differences that existed in the groups from the different high schools and thereby determine the probability that the difference in GPA is statistically significant (Tanner, 2012).

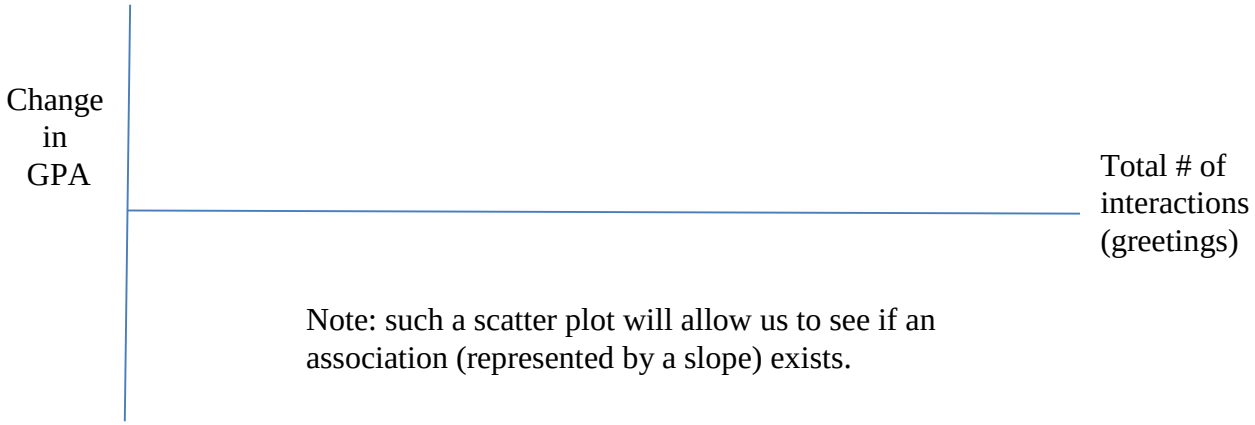
In the 2-sample t-test the $H_o$, or null hypothesis to reject, was $H_{o:}\ \mu_9 = \mu_{10}$ where $\mu_9$ was the population mean GPA of the struggling students in the previous academic semester and $\mu_{10}$ was the population mean GPA of the same struggling students in the transitional first semester of high school. This made the $H_a$: $\mu_{10} > \mu_9$ the desired outcome of the study. The same process was repeated with the core GPA from the consecutive semesters as this removed the variable of elective courses that may be different from school to school and even within the same school.

The numerical data on the frequency and types of interaction allowed the study to perform a linear progression t-test to test for an association between the number of interactions

and the change in GPA for students who received an *invisible mentor* (Tanner, 2012). The data generated a scatter plot (Figure 2) with the number of interactions being the Independent Variable and the Change in GPA being the Dependent Variable.

Figure 2

*Sample scatter plot of the # of interactions vs GPA*




The above scatter plot was created using Excel, and a slope determined for each type of interaction and for the combined number of interactions the *invisible mentor* had with their mentee. In addition, both GPA and core GPA were represented on different graphs. The null hypothesis $H_o$: Slope =0 represented no association between the volume/type of interaction and change in GPA, whereas the $H_o$: Slope $\neq 0$ implied an association.

**Limitations**

Several limitations presented themselves in the design and results of this study. The limitations of a study provide boundaries for the project as well as awareness that no design is flawless (Creswell, 2015; Marshall & Rossman, 2016). Although efforts were made to establish control groups from similarly populated high schools in the same geographic and economic region, the nature of school dictates that each school will initiate their own formal and informal

interventions with struggling students. These interventions employed by individual teachers, school counselors, and staff bring in uncountable factors into the educational results in all three subject groups. Each building has a slightly different bell schedule and variation of an advisory program. Although each school in the study comes from the same district leadership, have building principals who have led multiple staffs, and seem to fit the similar community perception of above-average, yet cannot boast of any significant academic accomplishments, there remains cultural differences among the buildings. School Y has been in existence for less than 20 years, and many of the staff have been there for the entire life of the school. This sense of ownership and originality gives it a unique adult culture from the other two schools that cannot point to any original staff members.

A closer look at the population of struggling students at "School M Treatments Group" would expose unavoidable differences in the relational and coaching skills of the volunteer staff mentors. Although mentors followed through with their commitment to connecting with their mentee multiple times each week to build rapport, offer encouragement, and provide informal accountability, each of the mentor-mentee pairings morphed into a uniquely different, and potentially, effective partnership due to the personality and skills of the individuals. The mentors and mentees were paired together by the researcher by the proximity of one of the identified student subjects being in a classroom near the volunteering teacher mentor. The gender, experience, courses taught, age, etc. of the mentor was not considered and the potential significance of these demographics on the mentoring relationship was beyond the scope of this study. Another limitation that bears mentioning is the possibility that a teacher could inflate the grades of the student subject because they knew the data was being collected. Although names of the mentee were never mentioned to the entire staff and the *invisible mentor* was not

responsible for the academic assessment of their mentee, it is possible that a mentor communicated the identity of their mentee to one of their teachers.

Finally, this study was limited in the relatively small number of participants and the lack of demographic data collected. Twenty-eight students (three students transferred out the school in the middle of the semester) at the treatment high school is a minimal sample size and educators should be wary to generalize the results to settings outside of the characteristics found in the population and community of students described in this study. In addition, it was beyond the scope of this study to compare the demographics of the three mentee groups – gender, race, ethnicity, language, family status. This data was not collected during this study.

Overall, however, this study may add to the empirical knowledge in the field of mentoring for struggling students and expands the base of information in the utilization of trained, professional staff members who are in potential contact with the mentees much more than the traditional mentoring programs based in the community as opposed to the school campus.

**Role of the Researcher**

The researcher's previous work at four high schools, in three school districts, within the Pacific Northwest has contributed informal research and experimentation to this study. Since leaving the classroom in 1999, concluding eleven years of anecdotal evidence gained from teaching 9$^{th}$ graders in a four-year high school, the researcher began looking school-wide at the topics of transitioning students to high school, how to quickly identify struggling students, and the means by which effective support, in ways such as mentoring, may be provided to students in their first year of high school.

The reliability of teachers being able to identify students with just a few weeks of classes who are lacking the academic habits or necessary effort and/or skills to facilitate success in a classroom has been seen personally by the researcher. This has brought about the selection process used in this study to identify those students who will receive mentors in School M and become the control groups at School X and School Y. This process was initiated by the researcher at all three schools to ensure consistency in the selection process.

The researcher, through the spontaneous and non-systematic assignment of eagerly volunteering staff members to serve as mentors to struggling students, has learned several pitfalls that seemed to occur in multiple buildings over the past 15 or more years. One is the extreme challenge of trying to support more than one student during a school year. In each instance, the staff member was unable to consistently follow the academic, attendance, and other pertinent data needed to be of consistent support and aid to the struggling student. A second observation was the time it took for a trusting bond to form when the student knew they were being assigned a staff member to help in their transition. The students, in the interpretation of the researcher, were slow to believe the authenticity of the assistance, especially if the staff member was a current teacher or athletic coach for that same student. Both items have impacted the researcher's design of this study where the staff member was assigned only one student to mentor, was *invisible* to the mentee, and would not be a current teachers or coach to the mentee.

# Chapter IV

# Results

## Introduction

The challenge remains to find an effective mentoring program for identified struggling high school students that promotes immediate academic success before lasting negative consequences (Grossman, Chan, Schwartz, & Rhodes, 2012; Schwartz, Rhodes, Spencer, & Grossman, 2013). Successful teenage mentoring programs have shown positive impact to be related to the quality of the mentor-mentee relationship, and often over a multi-year time period (Deutsch & Spencer, 2009; Rhodes & Lowe, 2008). Research is needed to examine a mentoring program that would provide an intervention for struggling students at a large, suburban middle-class high school that would yield positive academic results prior to low grades negatively impacting high school transcripts.

The purpose of this study was to explore the effectiveness of a mentoring program, as measured by academic grades, using teachers as mentors that intervened quickly and during 14 weeks of the first semester of the transition year into high school. Quantitative data was collected on approximately 30 students from each of three similar high schools; one where an additional caring adult mentor was provided, and two high schools where no such mentoring program existed. The central research questions for this study included the following:

1) What is the impact of an *invisible mentor*, an adult teacher from the same suburban school, on the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

2) Is there a relationship between the frequency of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
3) Is there a relationship between the types of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

As discussed in Chapter III, struggling students were identified 12-15 days into the school year by their classroom teachers. Previous semester's overall GPA was collected as well as a core GPA calculated for English, math, and science. The data was compared to the same GPA from the first semester of high school. Additional data on the amount and nature of the interactions between the *invisible mentor,* a teacher at the school who volunteered to be an additional caring adult to an assigned student, and the mentee was collected.

This chapter outlines the results of the study. Organization begins with academic information on the participants at each of the three high schools as they entered into their first semester of the first year of high school, followed by the results of their grades earned at the end of first semester. The first research question applied a two-sample t-test utilizing SPSS to compare change in GPA between the experimental group and control groups with the aim of minimizing any differences that existed in the groups from the different high schools. Such a process determined the probability that the difference in overall GPA is statistically significant (Tanner, 2012). This test was repeated applying the core GPA that eliminated the impact of elective courses and focused only on the English, math, and science courses that were taken by all participants. The final two research questions were then addressed in a linear progression t-test to determine if an association between the number of interactions and the change in GPA for

students that received an *invisible mentor* existed. The data generated a scatter plot that allowed the researcher to search for a linear pattern that would suggest an association between the change in GPA and the frequency/types of interaction between student and *invisible mentor* (Tanner, 2012).

**Participants**

Teachers at each of three comprehensive, suburban high schools in the Pacific Northwest identified tenth-grade students who seen in their day to day observations were struggling to find academic success in the initial few weeks of the school year. Teachers were given the prompt, by the researcher, in the B.A.S.E. training protocol, "if what you are seeing is accurate, and if it continues, these students will struggle in my course". One of these schools, School M, identified 31 such students, 28 of whom finished the semester at School M. Each of these students were assigned to a teacher who did not have them in class but would volunteer to be their *invisible mentor*. As the mentor, they would work to build a natural connection with their assigned student and then pursue routine interactions with that student during school hours. At the other two high schools, School X and School Y, 31 students were also identified but were not involved in any sort of formal mentoring program.

**Results for Question 1: Impact of invisible mentor on the academic achievement**

To answer the first question, the overall GPA from the second semester of ninth grade and the first semester of tenth grade were collected for all participants at the three high schools. In these schools the tenth grade is the transitional year into high school. Secondly, a core GPA, composed of the three required subjects of English, math, and science, was calculated for the students. Utilizing a two-sample t-test, designed to determine if a significant difference existed between the group means, conclusions were drawn regarding the impact that *invisible mentors*

had on the academic achievement of struggling students transitioning into the first year of high school (Mertler & Reinhart, 2016; Tanner, 2012) (Appendix R).

First, the overall GPA of the participants at each of the three high schools as they entered their first semester of the first year of high school was collected and analyzed. Descriptive statistics were generated to determine the mean GPA of 1.747 (N = 28) from School M and mean GPAs of School X and School Y, 1.812 (N = 31) and 1.791 (N = 31) respectively do not differ significantly from one another.

The significance 2-tailed value of .541 for School X and .672 for School Y being > .05 meant the acceptance of the null hypothesis that the students at School M who received an *invisible mentor* were from a population similar to control groups at schools X and Y (Appendix N). The mean GPAs from the core courses of English, math, and science did not meet the same standard with the .031 and .004 significance values failing to surpass the .05 standard (Tanner, 2012). Since the significant difference of the means of the core GPA did not allow acceptance of the null stating they were from statistically similar groups, the core GPA will not be used in the comparative data between the two semesters (Appendix R).

At the conclusion of the initial semester of the first year of high school, GPA's were collected from the same three groups of students. The mean GPA of the struggling students at School M, after 14 weeks of interactions with an *invisible mentor*, was calculated to be 2.070. Table 3 illustrates a .323 increase was in stark contrast to the .300 and .536 decrease in GPA found in the two control groups of students at Schools X and Y. The t-test comparing the Equality of Means generated significance 2-tailed values of .008 and .000.

These values being < .05 meant the null hypothesis that the 28 students at School M who had an *invisible mentor* were from a population similar to control groups at schools X and Y

were rejected. Thus the change in GPA was significant between the experimental group and the control groups (Tanner, 2012). The two-sample t-tests from the initial and ending GPA scores demonstrated the mean growth of the students with *invisible mentors* represented a statistically significant shift as compared to their similarly composed control groups at the other schools. All students were enrolled in classes within the same school district with similar demographics, curriculum, and core values of leadership throughout the school. The GPA data prior to the first semester of the first year of high school showed no statistically significant difference, whereas the same descriptive statistics point towards a significant achievement shift in grades following the students at School M receiving the intervention of the *invisible mentoring* program (see Table 3).

Table 3

*GPA data for student participants (average)*

| | **9th grade 2nd sem GPA** | **10th grade 1st sem GPA** | **9th grade core GPA (Math, English, Science)** | **10th grade core GPA (Math, English, Science)** |
|---|---|---|---|---|
| School M (N=28) | 1.747 | 2.070 | 1.173 | 1.903 |
| | | **.323 increase** | | **.730 increase** |
| School X (N = 31) | 1.812 | 1.512 | 1.466 | 1.516 |
| | | .300 decrease | | **.050 increase** |
| School Y (N = 31) | 1.791 | 1.255 | 1.587 | 1.048 |
| | | .536 decrease | | .539 decrease |

An alternative look at the data examined the number of students who showed improvement in both GPA measures and the number showing a corresponding decrease (see Table 4). This demonstrated that not only do the averages improve for the students at School M where the mentoring program was instituted for struggling tenth graders, but also the number of

students finding success was greater as compared to the control groups. This implies that the improved GPA's are not being skewed by just a handful of students realizing large gains or losses. This data reinforce not only that the valuable grade point average improved for the students with an *invisible mentor*, but perhaps a preventive factor occurred that kept the students of School M from failing in both GPA measurements as the majority of their counterparts did at Schools X and Y. The decline in achievement, as measured by semester grades, is commonly viewed as typical and attributed to the change in school structure and environment (Benner & Graham, 2009; Ding, 2008; Schwerdt & West, 2013), and the absence of this decline at School M suggests that an *invisible mentor* influenced a reversal of such a trend.

Table 4

*Percentage of students' results*

| | Percentage showing improvement in both overall and core GPA | Percentage showing a decrease in both overall and core GPA |
|---|---|---|
| School M (N = 28) | 50.0% | 14.3% |
| School X (N = 31) | 25.8% | 51.6% |
| School Y (N = 31) | 22.5% | 71.0% |

**Results for Question 2: Frequency of interactions and academic achievement**

Data was collected from the *invisible mentors* of the 28 students at School M in order to look at the number of times they interacted with their struggling student. They did not have the assigned student subject mentee in any course or activity, but at some point in the school day, the mentee did enter a classroom near their mentor. Training sessions included appropriate and

effective strategies in how to meet and begin a natural connection with their mentee (Appendix H).

On average, *invisible mentors* reported an average of 28.9 total interactions with their student over the course of the study that ran from the beginning of October to the end of January. These interactions were categorized as a greeting (17.9 average), a non-academic discussion (7.3 average), or an academic discussion (3.8 average). The number of interactions ranged from zero, from a mentor who failed to even begin implementing the program, up to 48 total interactions over the 14 weeks.

Overall the group of struggling students showed an increase in overall GPA of .324 with the greatest gain being 1.366 increase following 40 interactions with their mentor. The struggling student mentee continued academic struggles with a decline of 1.110 GPA during the 14 weeks when their mentor failed to interact with them even once. Finally, 17 of the 28 students involved in the *invisible mentoring* program saw an increase in GPA as compared to their previous semester.

A linear regression scatter plot allows researchers to look for correlation between two variables and then calculate a percentage of the variability that can explained by the independent variable (Tanner, 2012). The predicting power of the frequency of interactions between the mentor and student, the independent variable, and the change in GPA, the dependent variable, can be represented by the equation $Y = 0.0289X – 0.5098$ and the calculated $R^2$ value of 0.3301 (see Figure 3).

In a similar manner, the same students showed an overall improvement in core GPA and the same linear regression model resulted in an equation of $Y = 0.0404 X - 0.4374$ with a $R^2$ value of 0.2509 that suggest that 25% of the variability in the change of core GPA can be

explained by the number of interactions with the *invisible mentor*. Only seven of the 28 students failed to show an improvement in their GPA for their core courses (see Figure 4). This finding is not as strong as the correlation involving the overall GPA.

Figure 3

*Scatter plot of frequency of interactions vs change in overall GPA*

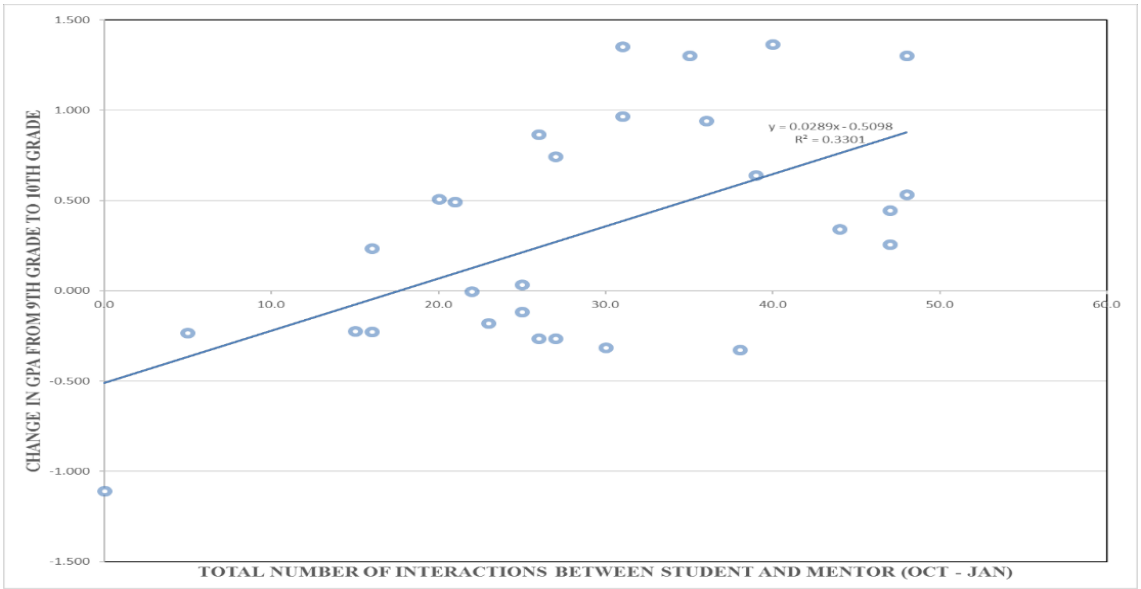
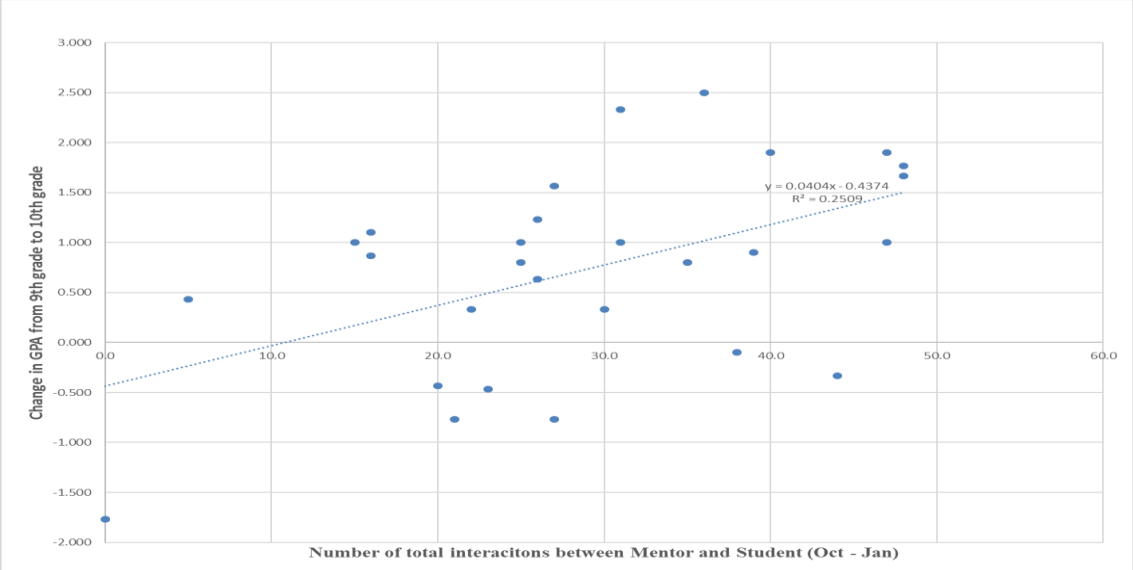



Figure 4

*Scatter plot of frequency of interactions vs change in core GPA*



**Results for Question 3: Types of interactions and academic achievement**

In an effort to identify more detailed information about the effectiveness of the *invisible mentoring* program, linear regression analysis and scatter plots were repeatedly done for the types of interactions the mentors had with their struggling mentee. As mentioned earlier, the most common interaction over the course of the semester was a greeting, an average of 17.9 times, followed by a non-academic discussion (7.3 times) and finally an academic discussion (3.8 times).

Positive regression lines were generated for all three types of interactions as the independent variable to the change in GPA and core GPA. The resulting reliability calculation ($R^2$) demonstrates the stronger predictability of greetings and non-academic discussions as compared to the academic discussions (see Table 5). This could be partly influenced by the reduced number of interactions made of the latter variety. Scatter plots for all interaction data can be found in Appendix N.

Table 5

*Regression lines and proportion of variance ($R^2$) for type of interactions*

| | Change in overall GPA | Change in core GPA |
|---|---|---|
| Greeting | y = 0.0344x - 0.2912<br>$R^2$ = 0.2276 | y = 0.0437x - 0.0506<br>$R^2$ = 0.1421 |
| Non-Academic discussion | y = 0.0538x - 0.0663<br>$R^2$ = 0.2007 | y = 0.0873x + 0.0969<br>$R^2$ = 0.2048 |
| Academic discussion | y = 0.0374x + 0.1834<br>$R^2$ = 0.0408 | y = 0.0537x + 0.5284<br>$R^2$ = 0.0325 |

**Conclusion**

The two-sample t-tests conducted on the mean grade point averages of the struggling students who had an *invisible mentor* for their transitional semester into high school provide evidence to conclude the probability that such a mentoring program had a positive impact on the

first semester grades of the first semester of high school. Due to the limited number of participants, and the absence of extensive demographic data available regarding both the mentors and mentees, educators should be wary to generalize the results to settings outside of the characteristics found in the population and community of students described in this study.

In a semester that traditionally shows a decline for all students (Hanewald, 2013; Isakson & Jarvis, 1999; Royster, Gross, & Hochbein, 2015; Vasquez-Salgado & Chavira, 2014), over 60.7% of the mentees showed an increase in overall GPA as compared to just 29.0% for School X and 22.6% for School Y. In addition, it was noted that the frequency and, to lesser degree, types of interactions may be positive predictors of a change in GPA in all courses and the core courses of English, math, and science.

Chapter IV provided the results of the applied analytical processes as a manner to address the research questions outlined in this study. All the results were from the same suburban school district with three-year comprehensive high schools with similar demographics (Appendix O and P). Chapter V will explore the implications that this study has for secondary educators as well as recommendations for further study that will continue to build on the limited quantitative data within the education field on the academic impact of mentoring programs in schools.

# Chapter V

# Conclusion

## Introduction

The concept of utilizing supportive adults in a mentoring capacity to guide students to academic success is endorsed universally by educators, parents, and guardians (Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Herrera & Karcher, 2013; Slack, Johnson, Dodor, & Woods, 2013). Research in quantitative studies indicates that mentoring can have a positive impact on struggling students, although with the caution that no mentoring may be better than ineffective mentoring (Black, Grenard, Sussman, & Rohrbach, 2010; Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Haddad, Chen, & Greenberger, 2011; McQuillin, Smith, & Strait, 2011; Radcliffe & Bos, 2011; Slicker & Palmer, 1993). The current academic perspective in the United States goes beyond merely the attainment of a high school diploma, but extends to the economic, life-style, and social benefits that come to students that develop a high school transcript that is characterized by an improving grade point average (GPA) in rigorous courses (Autor, 2014; Fan & Wolters, 2012; Gathmann, Jürges, & Reinhold, 2015; National Center for Education Statistics, 2014). An academic environment that resembles such a viewpoint needs to have supports for struggling students as they enter into high school that have the potential to benefit the students' GPA within the first semester so that an academic schedule can be realized that propels the students into a post-secondary pathway that increases their opportunity for education, lifestyle, and other goals (Eller, Lev, & Feurer, 2014; Kiriakidis & Jenkin-Williams, 2014; Pryce, 2012; Simões & Alarcão, 2014).

Chapter V discusses the results of an emerging mentoring program implemented in a suburban, middle class community. The findings of the *invisible mentoring* program, so named

for the students' unawareness of being assigned a volunteering teacher who agreed to meet and interact with their mentee, was conducted with a lens on practical implications for professional practice as well as recommendations for further study. The mentoring program identified struggling students, provided them with an additional caring adult for 14 weeks their first semester in high school, all with the aim of an immediate, significant improvement in grade point average.

**Purpose of the study and research questions.** The goal of this study was to provide struggling students a mentor that was committed to helping the student navigate their first semester in the first year of high school in such a manner that an improvement in first semester grades would occur. The existence of a consistent, professional educator mentor in the school setting can assist a student in succeeding in their courses that leads to graduation (Bryan et al., 2012; Hardré, Sullivan, & Roberts, 2008; Martin, 2003; Pryce, 2012), however students who are struggling in their academic pursuits may not realize that such adults exist for them. The central research questions for this study included the following:

1) What is the impact of an *invisible mentor*, an adult teacher from the same suburban school, on the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
2) Is there a relationship between the frequency of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?
3) Is there a relationship between the types of interactions that an *invisible mentor* has with a mentee and the academic achievement, in terms of overall GPA and core GPA, of the struggling students transitioning into high school?

**Methodology review.** This study utilized quantitative research methods exclusively and data was collected from the treatment group of students during their initial year in a three-year high school. Three sub-groups of students were similarly identified by classroom teachers at three high schools in the same suburban, middle class school district as struggling in their first few weeks in tenth grade courses. The researcher eliminated any students whose previous grades or non-attendance patterns made them extreme risks to earn high school credits at a reasonable rate in a traditional school structure. In addition to semester grades data was collected from the volunteer teachers who were the *invisible mentors* to the 28 students at the school that implemented the new mentoring program. The statistical evidence allowed for two-sample t-tests to be generated on the GPA data collected on all courses and the core classes of English, math, and science taken by all students. Additionally, scatter plots were developed as an association between the quantity of contacts and the change in GPA for each type of contact.

## Summary of Results

This study investigated the impact of an *invisible mentoring* program designed to have an immediate, positive impact on the first semester grades of struggling high school students. This section will address the three significant findings that emerged through the analysis of the data collected from semester grades and the adult mentors. The first finding involves the comparison of grades to two control groups of students from high schools with similar demographics without a formal mentoring process to assist struggling students. The two additional findings come from the correlation of amount and type of interactions that happened between the mentor and student over the first semester of the school year. Highlighted will be the association that presents between the seemingly simple task of positive, encouraging greetings and a willingness to having

a conversation with students who have traditionally found it difficult to earn even a C-average in our school system.

**Finding #1: Significant improvement in Grade Point Average**

Teenage students have traditionally struggled in the first semester, and sometimes longer, of high school (Benner & Graham, 2009; Casillas et al., 2012). The students (n = 28) who benefited from the *invisible mentor* program statistically reversed this national trend. The mean GPA of students with *invisible mentors* increased by 0.323, while the two control groups saw a decline of 0.300 and .536 respectively. Stated another way, three statistically similar groups began their first year of high school with a C- average and, following just one semester that involved having an *invisible mentor*, the experimental group now had a C average, while the other two dropped to a D+ average. In addition, 50.0% of the students at School M saw an increase in their overall GPA and core GPA, as compared to the 25.8% and 22.5% of the statistically comparative control groups at the other two high schools. On the reserve side, only 14.3% saw a decrease in GPA in both categories if involved in the *invisible mentoring* program, whereas 51% and 71% of the students at School X and Y decreased their GPA in both categories.

**Implications for Professional Practices.** The results of this study may contribute to qualitative research demonstrating the potential power of "natural forming mentors", especially if there is a shared activity with a mutually beneficial interest (Beam et al., 2002; Liang et al., 2009). The *invisible mentoring* program demonstrated that academic growth may be positively impacted within a 14 week time period during the transition of the first semester of the first year in high school.

The results of this study serve as a starting point for School M and the residing school district. District discussions could focus on how results can be enhanced to an even larger

degree with the presence of an administrator or school counselor on site to continue monitoring the consistency of mentors connecting with their mentee. Additionally, the opportunity exists to coordinate the mentoring program with existing tutoring, clubs, and extra-curricular activities to seek impact on the welcoming nature of an academic school culture. Also, a total of three students from school M were removed from the results because they withdrew from school prior to the end of the semester. A process could be put into place to support existing mentors and give them a new mentee if a student withdrawals from the school. This appears to be an easily implemented program that takes minimal time away from the teachers' busy workload and demonstrates immediate results that benefit both the student, teacher, and school.

**Recommendations for Further Study.** Finding #1 encourages this Pacific Northwest school district to continue the same study beyond the 14 weeks that constituted the program thus far. The goals of continued monitoring should be:

1) investigation of whether improvements continue along a similar pace or whether improvements level out for students participating in the mentoring program.
2) documentation of grades for the control group students to analyze if/when improvement begin.
3) replication of the program at one of the other schools to determine if the results can be represented again at the same school and recognized at a new school while maintaining one school as a control group.
4) an expansion of the study utilizing a larger population of students at this same school. This could be accomplished by adding a group of students whose entering cumulative GPA is in the 2.000 to 2.333 range with the additional goal of comparing the growth of this group to the lower academic group in the previous study.

The teachers who served as mentors have been encouraged to continue to be intentional about reaching out to their mentee as the school year continues. They have been made aware of the potential of results, and of the potential detrimental impact on students who bond with a mentor and then the mentor leaves (Black, Grenard, Sussman, & Rohrbach, 2010; Dubois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Haddad, Chen, & Greenberger, 2011; McQuillin, Smith, & Strait, 2011; Radcliffe & Bos, 2011; Slicker & Palmer, 1993). Continued quantitative data collection may also add to the qualitative data collected that highlight the long-term positive impact of mentoring when it encompasses the needs and goals of the student (Eller, Lev, & Feurer, 2014; Kiriakidis & Jenkin-Williams, 2014; Pryce, 2012; Simões & Alarcão, 2014). This clearly fits the potential rich environment of a high school.

**Finding #2: Positive correlation between amount of interactions and student achievement**

Despite never having their student mentee in a class that they were instructing, an emerging positive correlation appeared between the independent variable of the frequency of interactions and the change in semester grade point average. With a range of zero to 48 interactions over the 14 weeks, the struggling students showed an increase in GPA of .324 with the greatest gain being 1.366 increase following 40 interactions with their mentor. The student participant continued their academic struggles with a decline of 1.110 grade point average during a semester when their mentor failed to interact with them even once. Finally, 17 of the 28 students involved in the *invisible mentoring* program saw an increase in GPA as compared to their previous semester.

Although a direct causal connection cannot be made due to the multitude of variables that exist in a student's life and a school environment, the data demonstrated a positive regression

line. In addition, a predicting power of 33% and 25.1% for the variability discovered in the change of GPA's of the 28 struggling students in the experimental group (see Table 6).

Table 6

*Regression lines and proportion of variance ($R^2$) for total number of interactions*

| | Change in overall GPA | Change in core GPA |
|---|---|---|
| Total # of interactions | Y = .029X – 0.510<br>$R^2$ = .330 | Y = .040X – 0.437<br>$R^2$ = .251 |

**Implications for Professional Practices.** Teachers are committed to providing the best learning environment possible for their students to achieve academically and to feel safe in their rooms. Many students feel supported and welcomed in their schools, but the quantitative data suggests the power of a teacher encouraging and supporting a student whom they do not currently have in class. The researchers 17 years as a secondary administrator has led to the belief, due mainly from conversations over the years with struggling students, that many struggling students believe that if their teachers are being nice to them it is because they have to; it is their job. The *invisible mentor* breaks through such a mindset and demonstrates the power of simple greetings of kindness and/or a small conversation that might not even be related to course work.

Professional development for teachers ought to include sessions on the results of this study. Educators can brainstorm creative ways to interact with and have a welcoming impact on the students who walk their hallways. This study points to the collective responsibility a school has to encourage and support not only within the classroom, but throughout the campus. A typical secondary school of 1500 students will have 100 adult members. The potential ripple effect of each of them finding two or more opportunities each week to encourage a student or

two consistently over the course of a school year. It would take very minimal coordination to ensure that each struggling student had an encourager on campus.

**Recommendations for Further Study.** As with the earlier finding, finding #2 encourages the continued practice and analyzation of results unearthed by the *invisible mentor* program in this Pacific Northwest school district. Just one semester into the new program, there is several items to still explore such as:

1) analyze the cumulative impact of interventions over a longer period. The overwhelming number of interactions were greetings; would this continue or would the development of a relationship bring about more in-depth conversations?
2) investigate the results when less active mentors begin consistent interactions with the struggling student.
3) replication of the program to students at one of control group schools while maintaining one school as a control group.
4) expansion of the program to include more students and staff members that are not classroom teachers. There are many caring adults on a school campus that are not certificated teachers like the ones used in this study.

It is a powerfully encouraging thought to realize that a teacher at work has the potential to improve the academic achievement of a student who simply is walking by their classroom on a daily basis. The transforming potential of a school culture that works together to encourage students that are learning in the classroom of their colleagues could start a ripple effect born of the realization that the educators efforts are interconnected.

**Finding #3: The impact of greetings, small discussions on student achievement**

A linear regression test illustrates the association between a change in GPA and the frequency and types of interaction by a teacher who does not have that student in class. The strongest correlation is represented by simple greetings and non-academic conversation represented by $R^2 = .228$ and $R^2 = .201$ respectively. These numbers compare to the coefficient of determination of $R^2 = .041$ for academic discussions. Teachers may believe that they must have academic discussion to have an impact on the achievement of students. The data from this study points to the power of showing consistent interest in students as individuals and that their will be an academic ripple effect.

**Implications for Professional Practices.** Someone who didn't "have to" care, did! With very little extra effort on the part of teachers, staff can assist the improvement of academic achievement of the students in their colleague's classrooms. Students who might someday be in their classroom, will be coming to them with greater prior success and foundational learnings. Teachers have long been able to quickly identify students who are struggling in their classrooms; imagine the encouraging teacher training day at the end of the first month of each school year where teachers share names of students with their colleagues and the confidence that the simple practice of "adopting" a mentee in a neighboring class will improve learning and that it could be a reciprocal exchange between teachers.

**Recommendations for Further Study.** As with earlier findings in this study, finding #3 implores educators within this Pacific Northwest school district to continue the length of the study. The program in such a state of infancy has more discoveries ahead in the following areas:

1) expand the study to students with different GPA and age ranges.

2) investigate the growing impact of academic discussions. During this brief study of 14 weeks, greetings and non-academic discussions accounted for 87.1% of the interactions. This alone may explain the relative low impact of academic discussions in the study.
3) incorporate older, more mature, students into the role of mentor/encourager.
4) explore the demographics of the mentors and see if there were correlations between years of experience, age, or other traits and the academic improvement of struggling students.
5) attempt to develop criteria by which mentors can be identified and evaluated as the program grows.

As educational leaders continue to strategize with staff, and develop corresponding professional development, to enact comprehensive school improvement plans that increases the learning of each student, the power of non-academic interactions that can be as simple as a consistent greeting must not be neglected. It is rooted in the belief, and now statistical evidence, that purposeful, consistent interactions are part of the portfolio of successful, improving students.

**Conclusion**

The purpose of this study was to examine the impact of an *invisible mentoring* program on the first semester grades of struggling high school students. This research provided quantitative data that a timely improvement is possible so that permanent grades on a high school transcript can reflect the academic abilities and potential of students. A mentoring program that can be implemented into any school with minimal professional development and work load to teachers is a powerful addition to any school campus. In addition, the unity building aspect of

fellow teachers improving the academic achievement of their colleagues' students has the potential to have a powerful impact on the culture of a school.

The quantitative nature of the study may supplement the volume of research done on mentoring that is typically qualitative in nature. In addition, the focused intervention on struggling students as opposed to the traditional research targeting the more extreme at-risk teen, may broaden the scope of research on mentoring programs. Finally, the use of teachers on campus, yet unknown to the students, allows for the known importance of consistency in mentoring along with the effectiveness of natural forming relationships. The results of the study answered the three research questions as follows:

1) An *invisible mentor*, an adult teacher from the same suburban school, has some impact on the academic achievement, in terms of overall GPA, of the struggling student transitioning into high school.
2) There was some positive relationship between the amount of interactions that an *invisible mentor* has with a mentee and their academic improvement, in terms of overall GPA and core GPA, of the struggling student transitioning into high school.
3) The types of interactions that an *invisible mentor* had with a mentee that had some influences on academic improvement, in terms of overall GPA and core GPA, are greetings and non-academic discussions.

The quantitative results from this study revealed that struggling students who had an *invisible mentor* improved their semester GPA from a C- average of 1.75 to a C average of 2.07. This stands in contrast to the similarly constituted control groups whose grades lowered to a D+ average of 1.38. These results were realized by the power of consistent greetings and conversations in between classes and within the relatively short time period of 14 weeks. The

research study validates belief held by many that mentoring is valuable and positive (Beam et al., 2002; DuBois et al., 2002; Eby, Allen, Evans, Ng, & DuBois, 2008; Haddad et al., 2011; Hamilton et al., 2006; Liang et al., 2008; Rhodes et al., 2000). Perhaps more importantly, it demonstrates that mentoring can have an immediate impact on academic achievement for students who struggle to find consistent success. It is a matter of time and educators have the time to make a difference starting immediately.

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# Appendix A

## Parental Informed Consent for Sophomore Mentoring Program

Dear Sophomore Parents:

[redacted] High School has the opportunity this year to work with [redacted], Eric Hogan, M.Ed., EdS. Mr. Hogan is currently a doctoral student in Educational Leadership at Northwest University. He is conducting a research study examining the effects that student mentoring programs have on academic achievement. This study could involve your child being assigned an academic mentor. For this specific study, the mentor would be one of [redacted] High School's current staff members and would serve as an additional encouraging adult on our campus as we hope to assist your student in reaching their full academic potential in their initial semester at [redacted] High School.

You are being asked to give your consent for your sophomore at [redacted] High School to potentially be selected as one of the mentees. Your child's participation is voluntary. You may withdrawal your consent in this study at any time and without any negative consequences. There will be no penalties (i.e. detention, loss of grade, held after class, or sent to the principal's office) as a result of your child not participating in the study or withdrawing from the study. No data will be collected from your child. This research study is unlikely to cause distress.

If you have any questions about your child participating in this study, please feel free to contact Eric Hogan at ehogan@nnu.edu or [redacted]. You may also contact Dr. Bethani Studebaker, Doctoral Committee Chair at Northwest Nazarene University at bstudebaker@nnu.edu or [redacted].

**Please return this Consent form to [redacted] High School when your student comes to school for Orientation this fall.**

I affirm that I am the parent/guardian of _____ (printed name of student), a sophomore at [redacted] High School and I give my informed consent for them to be in the mentoring research study.

_____ _____

(printed name of parent/guardian) (signature of parent/guardian)

I affirm that I am the parent/guardian of _____ (printed name of student), a sophomore at [redacted] High School and I do not wish for them to be in the mentoring research study.

_____ _____

(printed name of parent/guardian) (signature of parent/guardian)

**Appendix B**

# B.A.S.E.

Students showing concerns in **B**ehavior, **A**ttendance, **S**kills and/or **E**ffort

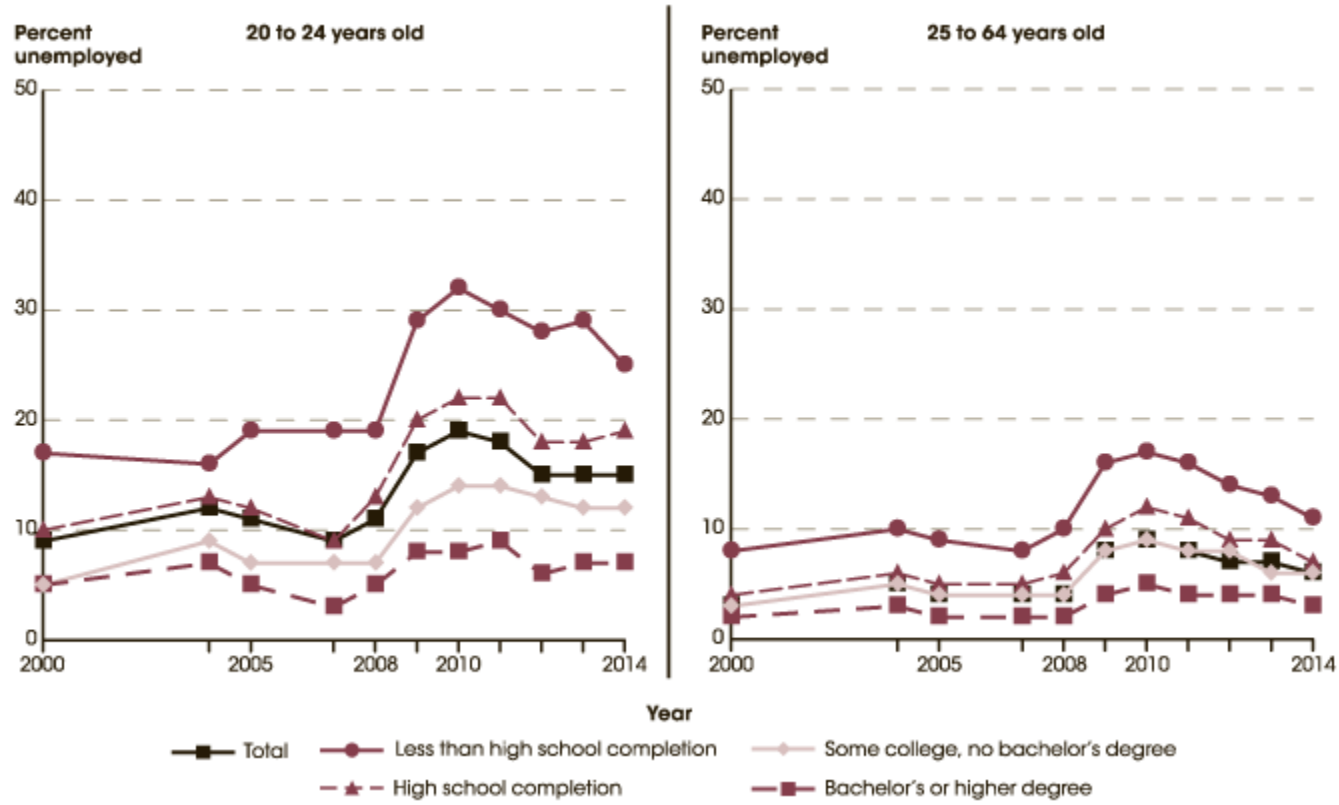
Teacher Name _____ Date _____.

| | | | | |
|---|---|---|---|---|
| **1)** | Behavior | Attendance | Skills | Effort |
| **2)** | Behavior | Attendance | Skills | Effort |
| **3)** | Behavior | Attendance | Skills | Effort |
| **4)** | Behavior | Attendance | Skills | Effort |
| **5)** | Behavior | Attendance | Skills | Effort |
| **6)** | Behavior | Attendance | Skills | Effort |
| **7)** | Behavior | Attendance | Skills | Effort |
| **8)** | Behavior | Attendance | Skills | Effort |
| **9)** | Behavior | Attendance | Skills | Effort |
| **10)** | Behavior | Attendance | Skills | Effort |
| **11)** | Behavior | Attendance | Skills | Effort |
| **12)** | Behavior | Attendance | Skills | Effort |
| **13)** | Behavior | Attendance | Skills | Effort |
| **14)** | Behavior | Attendance | Skills | Effort |
| **15)** | Behavior | Attendance | Skills | Effort |
| **16)** | Behavior | Attendance | Skills | Effort |
| **17)** | Behavior | Attendance | Skills | Effort |
| **18)** | Behavior | Attendance | Skills | Effort |
| **19)** | Behavior | Attendance | Skills | Effort |
| **20)** | Behavior | Attendance | Skills | Effort |
| **21)** | Behavior | Attendance | Skills | Effort |
| **22)** | Behavior | Attendance | Skills | Effort |
| **23)** | Behavior | Attendance | Skills | Effort |
| **24)** | Behavior | Attendance | Skills | Effort |
| **25)** | Behavior | Attendance | Skills | Effort |
| **26)** | Behavior | Attendance | Skills | Effort |
| **27)** | Behavior | Attendance | Skills | Effort |
| **28)** | Behavior | Attendance | Skills | Effort |
| **29)** | Behavior | Attendance | Skills | Effort |
| **30)** | Behavior | Attendance | Skills | Effort |
| **31)** | Behavior | Attendance | Skills | Effort |
| **32)** | Behavior | Attendance | Skills | Effort |
| **33)** | Behavior | Attendance | Skills | Effort |
| **34)** | Behavior | Attendance | Skills | Effort |
| **35)** | Behavior | Attendance | Skills | Effort |
| **36)** | Behavior | Attendance | Skills | Effort |

Form created by Eric Hogan

# Appendix C

**Unemployment rates, by age group and educational attainment: Selected years, 2000 through 2014**




NOTE: The unemployment rate is the percentage of persons in the civilian labor force who are not working and who made specific efforts to find employment sometime during the prior 4 weeks. The civilian labor force consists of all civilians who are employed or seeking employment. Data for 20- to 24-year-olds exclude persons enrolled in school. The data for the "Some college, no bachelor's degree" category includes persons with no bachelor's degree as well as those with an associate's degree. High school completion includes equivalency credentials, such as the General Educational Development (GED) credential.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Office of Employment and Unemployment Statistics, unpublished annual average data from the Current Population Survey (CPS), selected years, 2000 through 2014. See *Digest of Education Statistics 2014*, table 501.80.

http://nces.ed.gov/programs/digest/d14/tables/dt14_501.80.asp

# Appendix D

[redacted]

October 16, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mr. Eric Hogan

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [redacted] School District has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mr. Hogan has permission to conduct his research in the district of and with students and staff of the [redacted] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,

[redacted]
Superintendent

[redacted]

# Appendix E

[redacted] High School

[redacted], Principal
[redacted] Assistant Principal
Assistant Principal
Assistant Principal

October 16, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mr. Eric Hogan

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [redacted] High School has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mr. Hogan has permission to conduct his research in the district of and with students and staff of the [redacted] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,

[redacted]

Principal, [redacted] HS

[redacted]

# Appendix F

[redacted] High School

[redacted] Principal
[redacted] Assistant Principal
Assistant Principal
Assistant Principal

October 16, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mr. Eric Hogan

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [redacted] High School has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mr. Hogan has permission to conduct his research in the district of and with students and staff of the [redacted] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,

[redacted]

Principal, [redacted]

[redacted]

# Appendix G

[redacted] *High School*

[redacted], *Principal*
[redacted] *Assistant Principal*
*Assistant Principal*
*Assistant Principal*

October 16, 2015

Northwest Nazarene University
Attention: HRRC Committee
Helstrom Business Center 1st floor
623 S. University Boulevard
Nampa, ID 83686

RE: Research Proposal Site Access for Mr. Eric Hogan

Dear HRRC Members:

This letter is to inform the HRRC that Administration at [redacted] High School has reviewed the proposed dissertation research plan including subjects, intervention, assessment procedures, proposed data and collection procedures, data analysis, and purpose of the study. Mr. Hogan has permission to conduct his research in the district of and with students and staff of the [redacted] School District. The authorization dates for this research are July 2016 to April 2017.

Respectfully,

[redacted]

Principal, [redacted]

[redacted]

# Appendix H

## Mentor Recruitment and Training Document

**Key background:**

- Some students struggle with transition into high school
- New surroundings (don't know where/who to go to)
- Lack of "natural mentors"
- Slow to realize that there are caring adults at their school

- Significant academic "damage" is done: before they "figure things out":
  - to learning,
  - to their GPA
  - academic confidence
- "Typically" adjustments are made and improvements show by middle of their Junior year.
- Traditional mentoring programs (Big Brother, Big Sister; Boys/Girls Club; etc) short comings:
  - Parents typically initiate the involvement
  - Consistent contact and duration of the mentor (< 6 months actually hurts)
  - Lack of information available to the mentor from schools.
- Mentoring programs can help students:
  - find success more quickly
  - aid in confidence
  - assist students in taking advantage of supports that already exist.(math tutoring, athletics, clubs, school counselors, etc)

**Appendix H (continued)**

**Key elements of *Invisible Mentor* Program for this school year:**

- Approximately 30 10th graders
    - Not the extreme cases
    - Manageable # so as to provide support for staff mentors
- Each student is assigned to 1 staff member (the *invisible mentor*) without the knowledge of the student by 9/25.
    - A student you do not know or have in class/sport/club
    - Only 1 student per teacher
- From the students' perspective, we will find a "natural" way to meet the student and develop a rapport
    - Example of how to meet 1st time, next time, etc.
        - Have a neighboring teacher who has the student introduce you
        - Have a coach of a sport or club advisor introduce you as you volunteer or "drop by" their practice.
- The Mentor responsibility:
    - 1-2 contacts per week
    - Primary role is to encourage and be a caring adult on this campus (not counselor, tutor, etc)
    - Monitor grades, attendance, effort, and behavior, but be sensitive in bringing up the details directly to the student so as to not "creep them out".

**Appendix H (continued)**

- Do what seems appropriate to help the student find improved success as they face "challenges"
    - Remember your training on boundaries and professional ethics
    - Don't meet with them outside of school day or school sanctioned events
    - Facilitate awareness of school resources.
    - Be a part of their teachers attempt to encourage and assist (teamwork!)
- What if things are not "working"
    - Don't force the relationship
    - If you begin to feel uncomfortable in your role, or sense verbal or physical cues from the student that they are, please contact me (ehogan@nnu.edu or [redacted]) immediately.
    - You or the student can terminate your role at any time.

# Appendix I

## Maintaining Employee/Student Boundaries
## [redacted] School District
## Employee Training

2014-15

**Objectives**:

- Understand the relationship between boundary invasion, sexual grooming, and sexual molestation
- Understand Policy & Regulation
- Be able to identify boundary invasions
- Know the appropriate response to boundary invasions

**Scope of the Problem of Sexual Abuse of Students**

- 9.6% of secondary students report being subject to sexual misconduct by school staff
- 2/3 of those students said the misconduct involved physical contact
- 2,570 US teachers lost their certification between 2001 and 2005 due to sexual misconduct
- Only one in ten victims report to someone who can address the abuse
- Relationship of Boundary Invasions to Grooming to Molestation
- Why monitor boundary invasions?
- Molesters are “Grabbers” or “Groomers”
- 99.9% of educator sexual offenders are groomers, and grooming starts with boundary invasion
- Can’t predict offenders or victims by age or gender (no “typical” situation)
- Initial actions are opportunistic, or a result of bad judgment

**Appendix I (continued)**

- Groomers groom adults too-- boundary invasions are presented as evidence of professional concern for student
- Must create a culture that boundary invasions are noted and addressed when necessary

**Policy Elements**

- Educate employees, students, volunteers, parents and the public about appropriate and inappropriate professional boundaries
- Establish a standard of professionalism for employees
- Describe boundary invasions
- Create expectation of employees consulting with supervisors on issues
- Address technology-based communication media

**Regulation Elements**

- Examples of Boundary Invasions:
- Inappropriate physical contact
- Harassment
- Sharing pornography
- Singling out for friendship
- Socializing, especially with alcohol, drugs or tobacco
- Encouraging sharing of personal problems
- Using students for personal errands
- Sexual banter
- Personalized terms of address

**Appendix I (continued)**

- Frequent non-school communication
- Exchanging gifts or correspondence
- Sharing personal problems
- Giving students rides in personal vehicle
- Invading student's privacy
- Appearances of Impropriety
- Being alone, out of view, with a student
- Inviting or allowing individual students to visit home
- Visiting a student's home
- Social networking with students

**Reporting Requirements:** all people are encouraged to report concerns to the principal, employees are required to report within 48 hours

- Disciplinary Action for failure to comply
- Training required
- Dissemination of policy and regulation (on web)

**Expectations of Staff**

- Understand the Policy & Regulation
- Maintain high standards of professionalism in your work with students
- Consult with your supervisor if you have questions regarding your work with students, or another employee's apparent relationship with students
- Don't try to address another employee's conduct by yourself, involve a supervisor

**Appendix I (continued)**

**Related Reporting Requirements:** In addition to the Policy requirement that employees report suspected boundary invasions, employees must report:

- Suspected child abuse or neglect, by anyone (state law for certificated staff and District Policy for all employees)
- Suspected sexual abuse of a student by another employee (state law requirement of all employees)

**Conclusion**

- Sexual misconduct in schools is a significant problem impacting nearly one in ten students
- Nearly all sexual misconduct in a school setting starts with grooming and grooming starts with boundary invasions
- The only way to reduce, rather than respond to, sexual misconduct is to reduce inappropriate boundary invasions
- Therefore, District policy is to require staff to report and administrators to address boundary invasions

**Questions?**

## Appendix J

## INFORMED CONSENT/CONFIDENTIALITY FORM

### A. PURPOSE AND BACKGROUND

Eric W Hogan, a doctoral student in the Department of Graduate Education at Northwest Nazarene University is conducting a research study related to the use of mentors to increase the academic achievement of struggling 1st semester high school students. The selected students will not know that they have been assigned a staff member from their school to be their mentor. The relationships between the presence of a mentor will be reviewed. Possible factors that increase or decrease the effectiveness of the mentoring on 1st semester grades will also be reviewed. We appreciate your involvement in helping us investigate how to better serve and meet the needs of [redacted] High School students. Your primary role is to be an encourager for your mentee and help them access resources and activities available to them through their teachers and established school programs. You are not to serve as counselor or meet with student outside of the school day at non-school events.

You are being asked to participate in this study because you are a volunteer mentor at [redacted] High School, over the age of 18.

### B. PROCEDURES

If you agree to be in the study, the following will occur:

1. You will be asked to sign an Informed Consent Form, volunteering to participate in the study.

2. You will be asked to be an *invisible mentor* for one 10th grade student at [redacted] High School.

3. You will be asked to give periodic feedback during the 1st semester as to the number and types of interactions with your mentee.

These procedures will be competed at the end of the first semester of the 2016-17 school year.

### C. CONFIDENTIALITY

1. **Confidentiality**: Participation in research may involve a loss of privacy; however, your records will be handled as confidentially as possible. No individual identities will be used in any reports or publications that may result from this study. All data will be kept in a locked file cabinet, password protected computer or in password protected files. In compliance with the Federalwide Assurance Code, data from this study will be kept for three years, after which all data from the study will be destroyed (45 CFR 46.117).

2. Only the primary researcher, research assistant, and the research supervisor will be privy to data from this study. As researchers, both parties are bound to keep data as secure and confidential as possible.

**D. BENEFITS**
There will be no direct benefit to you from participating in this study. However, the information you provide may help educators to better understand the impact staff mentoring to struggling students may have on the immediate academic success of these students.

**E. PAYMENTS**
There are no payments for participating in this study.

**F. QUESTIONS**
If you have questions or concerns about participation in this study, you should first talk with the investigator. Eric W Hogan can be contacted via email at ehogan@nnu.edu , via telephone at [redacted]. If for some reason you do not wish to do this you may contact Dr. Bethani Studebaker, Doctoral Committee Chair at Northwest Nazarene University, via email at bstudebaker@nnu.edu.
Should you feel distressed due to participation in this, you should contact your own health care provider.

**G. CONSENT**
You will be given a copy of this consent form to keep.

**PARTICIPATION IN RESEARCH IS VOLUNTARY.** You are free to decline to be in this study, or to withdraw from it at any point. Your decision as to whether or not to participate in this study will have no influence on your present or future status as a staff member at [redacted] High School or the [redacted] School District. If at any point you, or your mentee, do not feel comfortable with this study please contact Eric Hogan via email at ehogan@nnu.edu .

***I give my consent to participate in this study:***

| | |
|---|---|
| **Signature of Study Participant** | **Date** |
| **Signature of Person Obtaining Consent** | **Date** |

**THE NORTHWEST NAZARENE UNIVERSITY HUMAN RESEARCH REVIEW COMMITTEE HAS REVIEWED THIS PROJECT FOR THE PROTECTION OF HUMAN PARTICIPANTS IN RESEARCH.**

# Appendix K

## CONFIDENTIALITY AGREEMENT

**It's a matter of Time: a quantitative study examining the impact of invisible mentors on the initial semester grades of struggling high school students**

I, [redacted] [name of research assistant], agree to assist the primary investigator with this study by collecting data on student participants, coding the names of mentors and mentees, and collecting and tabulating periodic questionnaire data from adult questionnaires. I agree to maintain full confidentiality when performing these tasks.

Specifically, I agree to:

1. keep all research information shared with me confidential by not discussing or sharing the information in any form or format (e.g., disks, tapes, transcripts) with anyone other than the primary investigator;

2. hold in strictest confidence the identification of any individual that may be revealed during the course of performing the research tasks;

3. not make copies of any raw data in any form or format (e.g., disks, tapes, transcripts), unless specifically requested to do so by the primary investigator;

4. keep all raw data that contains identifying information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession. This includes:
   - keeping all digitized raw data in computer password-protected files and other raw data in a locked file;
   - closing any computer programs and documents of the raw data when temporarily away from the computer;
   - permanently deleting any e-mail communication containing the data; and
   - using closed headphones if transcribing recordings;

5. give, all raw data in any form or format (e.g., disks, tapes, transcripts) to the primary investigator when I have completed the research tasks;

6. destroy all research information in any form or format that is not returnable to the primary investigator (e.g., information stored on my computer hard drive) upon completion of the research tasks.

Provide the following contact information for research assistant:

Printed name of research assistant [redacted]

Address: [redacted]

Telephone number: [redacted]

Signature of research assistant [redacted] Date 4-21-16

Printed name of primary investigator Eric Hogan

Signature of primary investigator [signature] Date 4/21/16

## Appendix L

## Three week Mentor Questionnaire

Date _____

Please describe the number and type of interactions that you have had with your mentee in the past 3 weeks:

Greeting: # _____
Non-academic discussion: #_____
Academic discussion: # _____
Other: # _____

**_____ total number of interactions**

**If you have any concerns, please share or contact Eric Hogan ([redacted]):**

**Comments (optional) :**

**(note: information collected by e-mail by research assistant)**

## Appendix M

## HRRC Approval from Northwest Nazarene University

From: Northwest Nazarene University <jjhill@nnu.edu>
Date: April 28, 2016 at 9:55:16 AM PDT
To: Eric Hogan <ehogan@nnu.edu>
Subject: RE: [Northwest Nazarene University] Submission Protocol #7042016 - It's a matter of time: A quantitative study examining the impact of invisible mentors on the initial semester grades of struggling...
Reply-To: jjhill@nnu.edu

Dear Eric,

The HRRC has reviewed your protocol: Protocol #7042016 - It's a matter of time: A quantitative study examining the impact of invisible mentors on the initial semester grades of struggling high school students. You received "Full Approval". Congratulations, you may begin your research. If you have any questions, let me know.

Northwest Nazarene University
Dr. Jennifer Hill
HRRC Member
623 S University Blvd
Nampa, ID 83686

## Appendix N

## Comparing the overall GPA's prior to Mentoring (9th grade)

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| GPA 9 | Mentoring | 28 | 1.74668 | .396681 | .074966 |
| | Control X | 31 | 1.81200 | .416086 | .074731 |

2-sample t-test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| GPA9 | Equal variances assumed | .022 | .881 | -.616 | 57 | .541 | -.065321 | .106113 | -.277810 | .147167 |

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| GPA 9 | Mentoring | 28 | 1.74668 | .396681 | .074966 |
| | Control Y | 31 | 1.79145 | .410380 | .073706 |

2-sample t-test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| GPA9 | Equal variances assumed | .072 | .789 | -.425 | 57 | .672 | -.044773 | .105316 | -.255664 | .166118 |

- The significance of .541 and .672 (highlighted above) being > .05 means that we accept the null hypothesis that the 28 students at School M who will receive an *invisible mentor* are from a population similar to control groups at schools X and Y.

## Appendix O

### Comparing the core GPA's prior to Mentoring (9th grade)

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| coregpa9 | Mentoring | 28 | 1.17343 | .529485 | .100063 |
| | Control X | 31 | 1.46571 | .482973 | .086745 |

2-sample t-test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| coregpa9 | Equal variances assumed | .002 | .968 | -2.218 | 57 | .031 | -.292281 | .131802 | -.556209 | -.028353 |

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| coregpa9 | Mentoring | 28 | 1.17343 | .529485 | .100063 |
| | Control Y | 31 | 1.58713 | .517394 | .092927 |

2-sample t-test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| coregpa9 | Equal variances assumed | .001 | .973 | -3.033 | 57 | .004 | -.413700 | .136395 | -.686826 | -.140575 |

- The significance of .031 and .004 (highlighted above) being < .05 means that we reject the null hypothesis that the 28 students at School M who will receive an *invisible mentor* are from a population similar to control groups at schools X and Y in their Core GPA's

## Appendix P

## Comparing the overall GPA's after 1 semester of Mentoring (10th grade)

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| gpa10 | Mentoring | 28 | 2.07043 | .764946 | .144561 |
| | Control X | 31 | 1.51168 | .784365 | .140876 |

2-sample t-test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| | Equal variances assumed | .033 | .856 | 2.765 | 57 | .008 | .558751 | .202113 | .154026 | .963476 |

Group Statistics

| | SCHOOL | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| gpa10 | Mentoring | 28 | 2.07043 | .764946 | .144561 |
| | Control Y | 31 | 1.25503 | .709980 | .127516 |

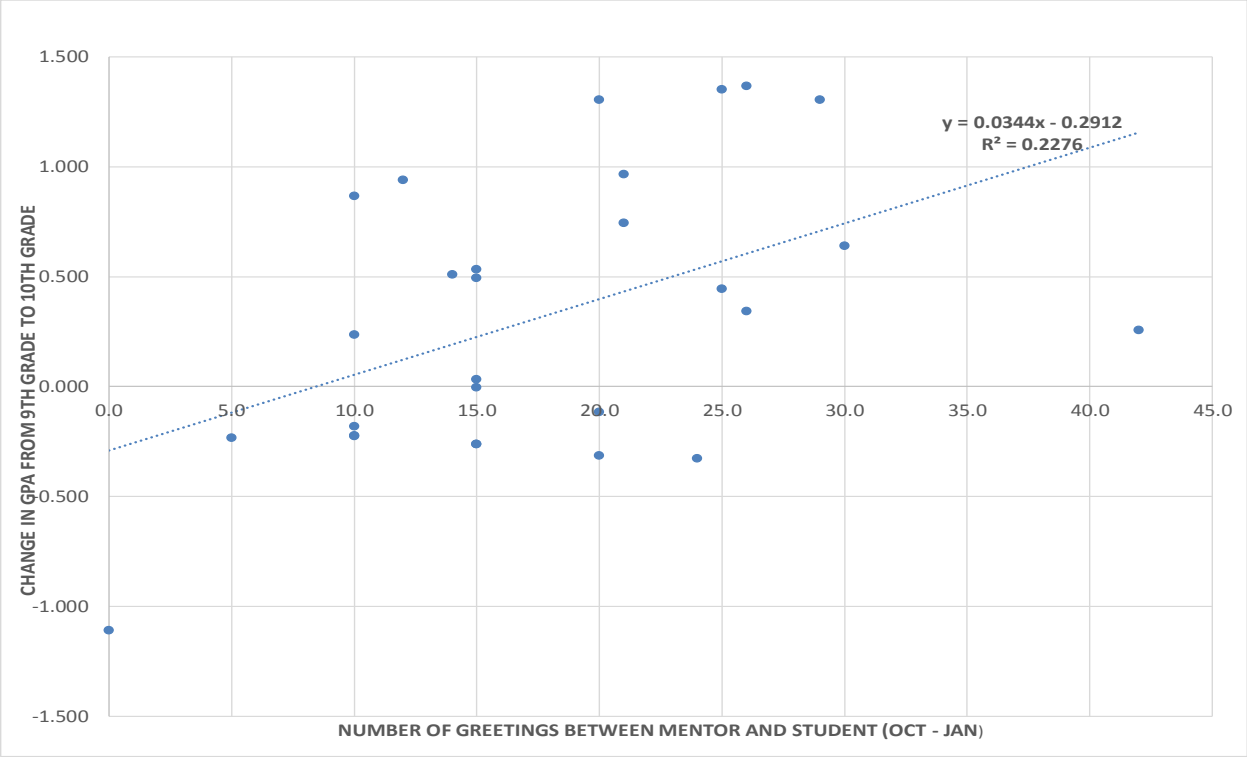
2-sample t-test

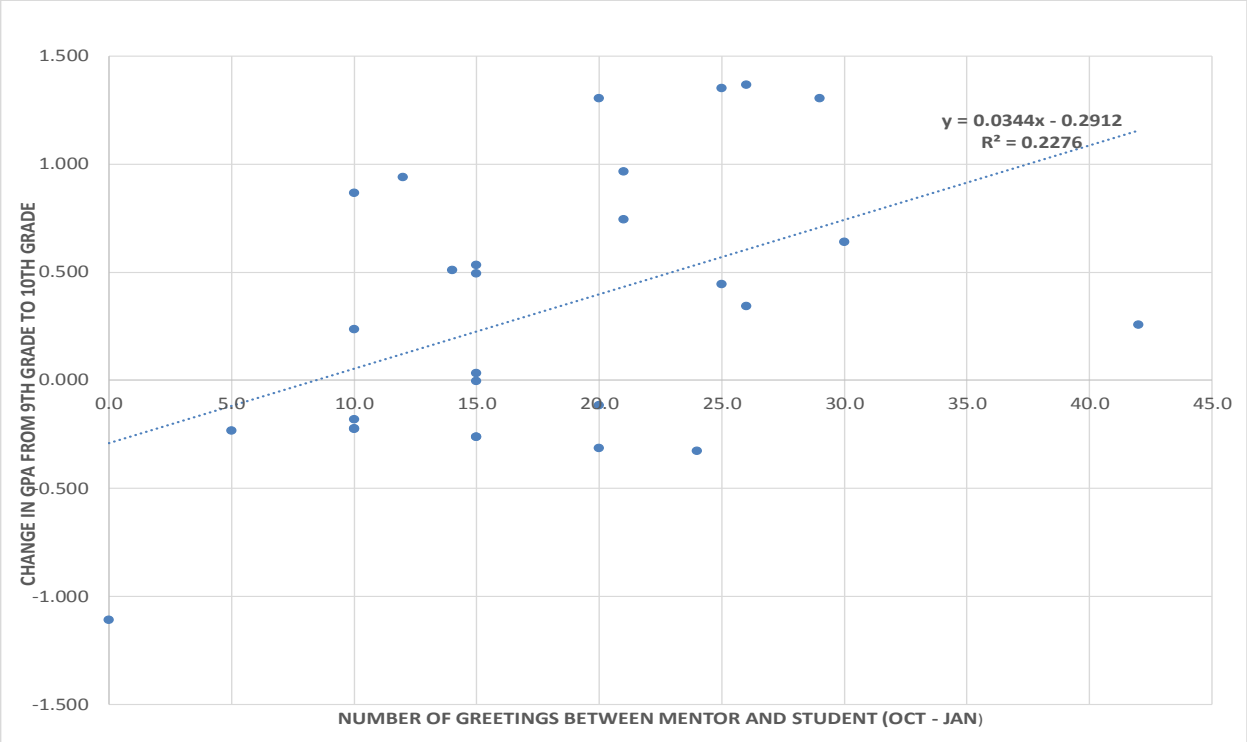
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| gpa10 | Equal variances assumed | .508 | .479 | 4.246 | 57 | .000 | .815396 | .192024 | .430875 | 1.199918 |

- The significance of .008 and .000 (highlighted above) being < .05 means that we reject the null hypothesis that the 28 students at School M who had an *invisible mentor* are from a population similar to control groups at schools X and Y and thus the change in GPA is significant between the experimental group and the control groups.

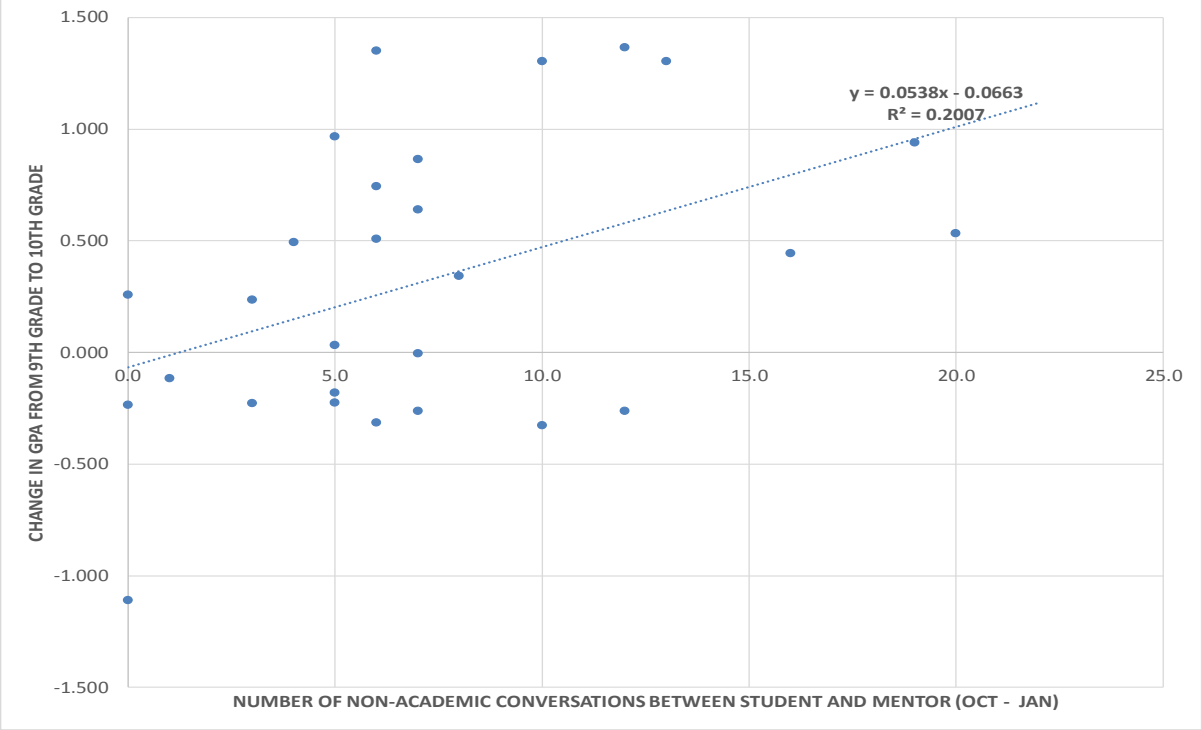
# Appendix Q

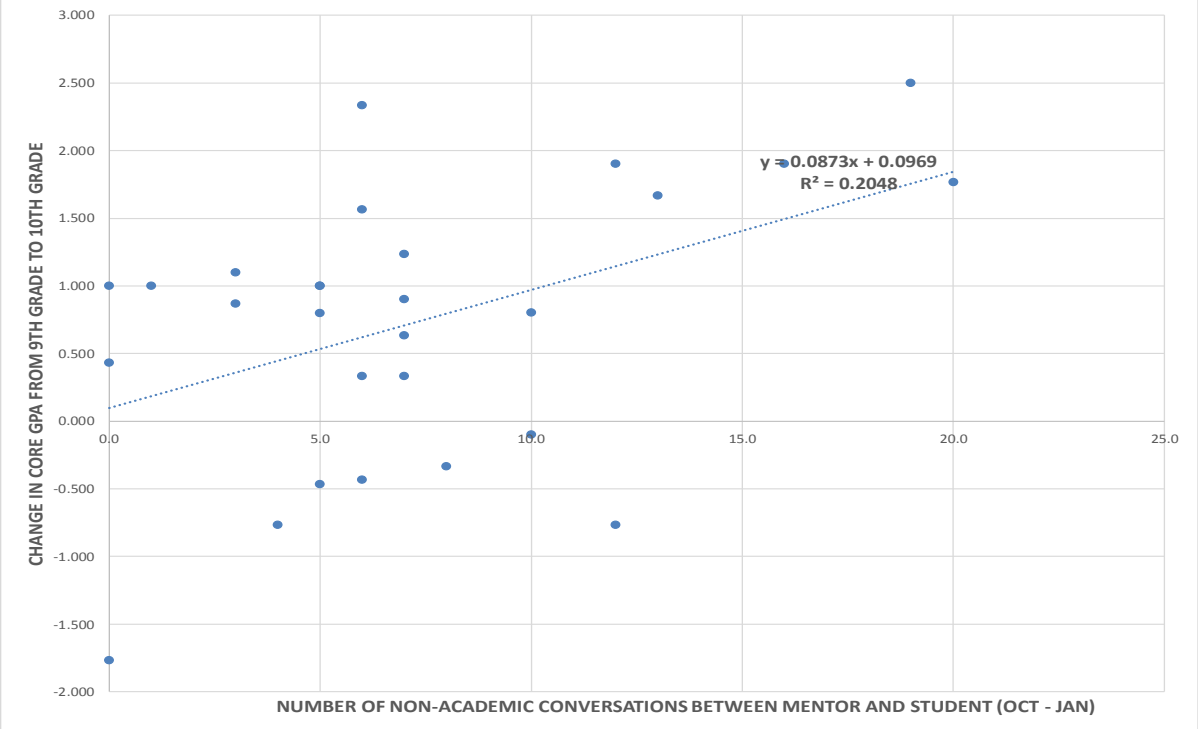
## Scatter Plots for Types of Interactions and Change in GPA



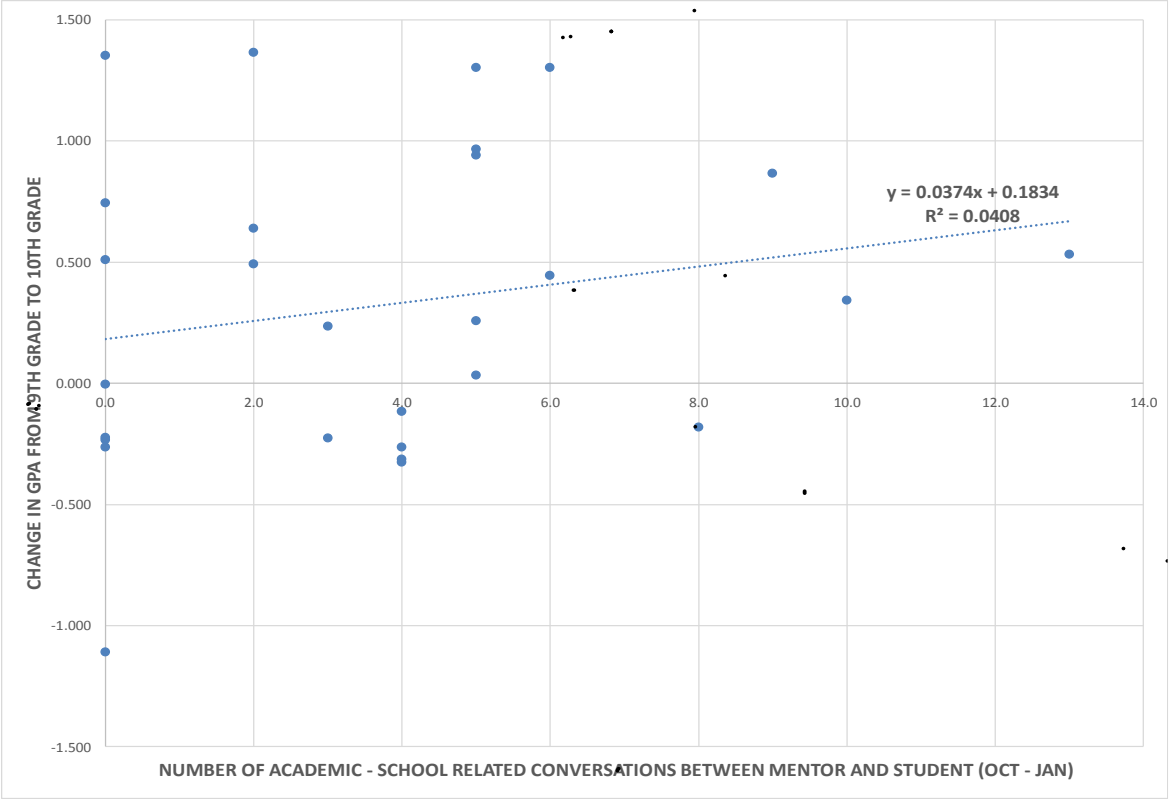



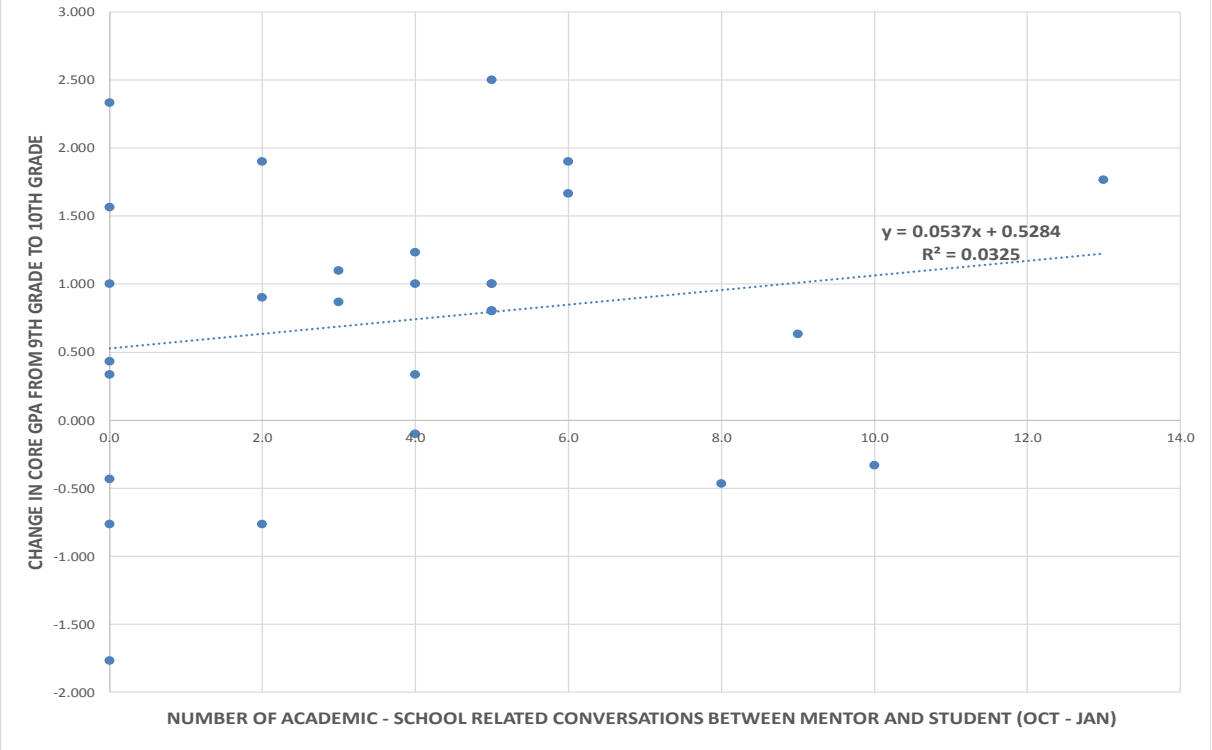
# Appendix Q (Continued)



## Appendix Q (Continued)



# Appendix R

## Raw Grade Point Average and Mentor Interaction Data from Schools

| student | mentor | 9th grade 2nd sem gpa | 9th grade core GPA (Math, English, Science) | 10th grade 1st sem gpa | | 10th grade core GPA (Math, English, Science) | | Total interactions in the first semester of transitional year (Oct thru January) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | difference | | difference | greeting | non-acad | acad/school | total |
| M1 | T1 | 1.900 | 1.000 | 2.433 | 0.533 | 2.766 | 1.766 | 15.0 | 20.0 | 13.0 | **48.0** |
| M2 | T2 | 1.900 | 1.333 | 1.666 | -0.234 | 1.766 | 0.433 | 5.0 | 0.0 | 0.0 | **5.0** |
| M3 | T3 | 1.429 | 1.333 | 1.166 | -0.263 | 0.566 | -0.767 | 15.0 | 12.0 | 0.0 | **27.0** |
| M4 | T4 | 2.200 | 2.133 | 3.166 | 0.966 | 3.133 | 1.000 | 21.0 | 5.0 | 5.0 | **31.0** |
| M5 | T5 | 1.671 | 1.100 | 1.666 | -0.005 | 1.433 | 0.333 | 15.0 | 7.0 | 0.0 | **22.0** |
| M6 | T6 | 2.060 | 0.500 | 3.000 | 0.940 | 3.000 | 2.500 | 12.0 | 19.0 | 5.0 | **36.0** |
| M7 | T7 | 1.429 | 1.430 | 2.733 | 1.304 | 2.233 | 0.803 | 20.0 | 10.0 | 5.0 | **35.0** |
| M8 | T8 | 2.043 | 1.233 | 1.816 | -0.227 | 2.100 | 0.867 | 10.0 | 3.0 | 3.0 | **16.0** |
| M9 | T9 | 1.243 | 0.333 | 1.500 | 0.257 | 1.333 | 1.000 | 42.0 | 0.0 | 5.0 | **47.0** |
| M10 | T10 | 2.000 | 2.000 | 2.866 | 0.866 | 2.633 | 0.633 | 10.0 | 7.0 | 9.0 | **26.0** |
| M11 | T11 | 0.943 | 0.666 | 0.616 | -0.327 | 0.566 | -0.100 | 24.0 | 10.0 | 4.0 | **38.0** |
| M12 | T12 | 1.800 | 1.100 | 3.166 | 1.366 | 3.000 | 1.900 | 26.0 | 12.0 | 2.0 | **40.0** |
| M13 | T13 | 2.043 | 1.666 | 2.683 | 0.640 | 2.566 | 0.900 | 30.0 | 7.0 | 2.0 | **39.0** |
| M14 | T14 | 0.814 | 0.333 | 1.050 | 0.236 | 1.433 | 1.100 | 10.0 | 3.0 | 3.0 | **16.0** |
| M15 | T15 | 1.457 | 2.200 | 1.950 | 0.493 | 1.433 | -0.767 | 15.0 | 4.0 | 2.0 | **21.0** |
| M16 | T16 | 1.857 | 1.100 | 2.600 | 0.743 | 2.666 | 1.566 | 21.0 | 6.0 | 0.0 | **27.0** |
| M17 | T17 | 1.529 | 1.233 | 2.833 | 1.304 | 2.900 | 1.667 | 29.0 | 13.0 | 6.0 | **48.0** |
| M18 | T18 | 1.514 | 1.233 | 1.333 | -0.181 | 0.766 | -0.467 | 10.0 | 5.0 | 8.0 | **23.0** |
| M19 | T19 | 1.814 | 0.666 | 3.166 | 1.352 | 3.000 | 2.334 | 25.0 | 6.0 | 0.0 | **31.0** |
| M20 | T20 | 2.671 | 1.666 | 3.116 | 0.445 | 3.566 | 1.900 | 25.0 | 16.0 | 6.0 | **47.0** |
| M21 | T21 | 2.429 | 1.433 | 2.166 | -0.263 | 2.666 | 1.233 | 15.0 | 7.0 | 4.0 | **26.0** |
| M22 | T22 | 1.557 | 1.100 | 2.066 | 0.509 | 0.666 | -0.434 | 14.0 | 6.0 | 0.0 | **20.0** |
| M23 | T23 | 1.557 | 0.433 | 1.333 | -0.224 | 1.433 | 1.000 | 10.0 | 5.0 | 0.0 | **15.0** |
| M24 | T24 | 1.833 | 0.766 | 1.716 | -0.117 | 1.766 | 1.000 | 20.0 | 1.0 | 4.0 | **25.0** |
| M25 | T25 | 1.657 | 1.000 | 2.000 | 0.343 | 0.666 | -0.334 | 26.0 | 8.0 | 10.0 | **44.0** |
| M26 | T26 | 1.943 | 2.100 | 0.833 | -1.110 | 0.333 | -1.767 | 0.0 | 0.0 | 0.0 | **0.0** |
| M27 | T27 | 1.914 | 1.000 | 1.600 | -0.314 | 1.333 | 0.333 | 20.0 | 6.0 | 4.0 | **30.0** |
| M28 | T28 | 1.700 | 0.766 | 1.733 | 0.033 | 1.566 | 0.800 | 15.0 | 5.0 | 5.0 | **25.0** |
| | | **1.747** | **1.173** | **2.070** | 0.324 | **1.903** | 0.730 | | | | |

## Appendix R (continued)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| X1 | | 1.200 | 0.666 | 0.166 | -1.034 | 0.333 | -0.333 |
| X2 | | 1.229 | 1.100 | 0.766 | -0.463 | 1.533 | 0.433 |
| X3 | | 2.086 | 1.666 | 0.783 | -1.303 | 0.333 | -1.333 |
| X4 | | 1.957 | 0.666 | 0.450 | -1.507 | 0.000 | -0.666 |
| X5 | | 1.557 | 1.766 | 0.740 | -0.817 | 0.333 | -1.433 |
| X6 | | 1.800 | 1.633 | 1.166 | -0.634 | 1.000 | -0.633 |
| X7 | | 1.429 | 1.000 | 1.566 | 0.137 | 1.666 | 0.666 |
| X8 | | 1.860 | 1.150 | 1.333 | -0.527 | 1.233 | 0.083 |
| X9 | | 1.757 | 1.666 | 3.500 | 1.743 | 3.666 | 2.000 |
| X10 | | 1.600 | 0.766 | 2.166 | 0.566 | 2.333 | 1.567 |
| X11 | | 1.900 | 1.433 | 2.500 | 0.600 | 2.466 | 1.033 |
| X12 | | 1.814 | 1.233 | 2.333 | 0.519 | 2.000 | 0.767 |
| X13 | | 1.629 | 1.233 | 0.716 | -0.913 | 1.100 | -0.133 |
| X14 | | 1.900 | 1.200 | 1.216 | -0.684 | 1.100 | -0.100 |
| X15 | | 1.957 | 1.000 | 2.733 | 0.776 | 2.233 | 1.233 |
| X16 | | 1.571 | 2.000 | 2.100 | 0.529 | 2.433 | 0.433 |
| X17 | | 1.771 | 1.900 | 1.000 | -0.771 | 1.000 | -0.900 |
| X18 | | 1.586 | 2.133 | 0.600 | -0.986 | 0.433 | -1.700 |
| X19 | | 1.714 | 1.900 | 1.566 | -0.148 | 0.900 | -1.000 |
| X20 | | 1.100 | 0.666 | 0.783 | -0.931 | 1.566 | -0.334 |
| X21 | | 1.571 | 1.000 | 1.333 | -0.238 | 1.333 | 0.333 |
| X22 | | 1.814 | 1.900 | 1.066 | -0.748 | 1.133 | -0.767 |
| X23 | | 1.671 | 2.330 | 1.500 | -0.171 | 1.566 | -0.764 |
| X24 | | 1.829 | 1.566 | 1.283 | -0.546 | 0.766 | -0.800 |
| X25 | | 1.657 | 1.233 | 1.950 | 0.293 | 2.000 | 0.767 |
| X26 | | 2.614 | 1.766 | 2.666 | 0.052 | 3.100 | 1.334 |
| X27 | | 2.900 | 2.400 | 2.666 | -0.234 | 1.666 | -0.734 |
| X28 | | 2.657 | 1.566 | 1.716 | -0.941 | 2.100 | 0.534 |
| X29 | | 1.471 | 1.333 | 1.283 | -0.188 | 1.233 | -0.100 |
| X30 | | 1.957 | 1.666 | 1.933 | -0.024 | 1.866 | 0.200 |
| X31 | | 2.614 | 1.900 | 1.283 | -1.331 | 2.566 | 0.666 |
| | | | | | | | |
| | | **1.812** | **1.466** | **1.512** | -9.924 | **1.516** | 0.319 |

## Appendix R (continued)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Y1 | | 1.757 | 1.000 | 2.550 | 0.793 | 2.666 | 1.666 |
| Y2 | | 2.400 | 2.633 | 2.000 | -0.400 | 1.333 | -1.300 |
| Y3 | | 2.157 | 1.566 | 0.933 | -1.224 | 0.433 | -1.133 |
| Y4 | | 1.129 | 1.100 | 0.000 | -1.129 | 0.000 | -1.100 |
| Y5 | | 1.771 | 2.000 | 1.580 | -0.191 | 1.200 | -0.800 |
| Y6 | | 2.329 | 1.866 | 0.383 | -1.946 | 0.333 | -1.533 |
| Y7 | | 1.371 | 1.100 | 1.283 | -0.088 | 1.000 | -0.100 |
| Y8 | | 1.786 | 1.633 | 2.000 | 0.214 | 1.666 | 0.033 |
| Y9 | | 1.814 | 2.666 | 0.500 | -1.314 | 0.000 | -2.666 |
| Y10 | | 2.657 | 2.000 | 2.716 | 0.059 | 2.666 | 0.666 |
| Y11 | | 1.771 | 1.566 | 2.450 | 0.679 | 1.900 | 0.334 |
| Y12 | | 2.200 | 2.233 | 1.733 | -0.467 | 1.900 | -0.333 |
| Y13 | | 1.286 | 1.000 | 1.350 | 0.064 | 1.566 | 0.566 |
| Y14 | | 2.329 | 2.100 | 1.616 | -0.713 | 0.666 | -1.434 |
| Y15 | | 1.667 | 1.000 | 1.616 | -0.051 | 1.333 | 0.333 |
| Y16 | | 1.771 | 1.800 | 1.450 | -0.321 | 0.900 | -0.900 |
| Y17 | | 1.211 | 1.150 | 0.216 | -0.995 | 0.433 | -0.717 |
| Y18 | | 2.200 | 2.133 | 1.500 | -0.700 | 1.000 | -1.133 |
| Y19 | | 1.143 | 1.000 | 0.716 | -1.134 | 0.000 | -1.000 |
| Y20 | | 2.086 | 2.533 | 1.450 | -0.636 | 1.000 | -1.533 |
| Y21 | | 1.700 | 1.433 | 0.333 | -1.367 | 0.333 | -1.100 |
| Y22 | | 1.857 | 1.766 | 1.283 | -0.574 | 1.566 | -0.200 |
| Y23 | | 1.386 | 1.000 | 1.600 | 0.214 | 1.433 | 0.433 |
| Y24 | | 2.057 | 1.333 | 0.833 | -1.224 | 0.333 | -1.000 |
| Y25 | | 1.329 | 0.776 | 0.883 | -0.446 | 1.433 | 0.657 |
| Y26 | | 1.771 | 1.566 | 1.433 | -0.338 | 1.533 | -0.033 |
| Y27 | | 1.771 | 1.150 | 0.550 | -1.221 | 0.766 | -0.384 |
| Y28 | | 1.771 | 1.333 | 1.900 | 0.129 | 1.333 | 0.000 |
| Y29 | | 1.286 | 1.533 | 0.500 | -0.786 | 0.666 | -0.867 |
| Y30 | | 2.343 | 1.566 | 0.333 | -2.010 | 0.000 | -1.566 |
| Y31 | | 1.429 | 1.666 | 1.216 | -0.213 | 1.100 | -0.566 |
| | | | | | | | |
| | | **1.791** | **1.587** | **1.255** | -17.336 | **1.048** | -16.710 |