POSTSECONDARY RETENTION AND PERSISTENCE: AN INQUIRY INTO TINTO'S CONDITIONS FOR SUCCESS

A Dissertation
by
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Abstract

POSTSECONDARY RETENTION AND PERSISTENCE:
AN INQUIRY INTO TINTO'S CONDITIONS FOR SUCCESS

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This study evaluated the impact of the Go. Persist. Succeed. 4 Success (GPS 4 Success) intervention at a rural community college in western North Carolina. The intervention, employed during the 2016-17 school year, was designed to provide services under the four conditions suggested by Tinto (2012a) to promote student persistence in higher education: 1) expectations; 2) support; 3) assessment and feedback; and 4) involvement (engagement). Services were provided to a group of 2016 high school graduates from a single district who, historically, have neither enrolled nor persisted in college at the same rates as their peers.

The analyses utilized a two-part methodology. The first part evaluated whether the services provided, in addition to a number of secondary variables, were significant predictors of persistence. The second

employed exploratory text analytics, using both the Linguistic Inquiry Word Count (LIWC) and SAS text miner programs.

When comparing intervention to control group students, neither the comprehensive intervention nor any of the individual service conditions were found to be significant predictors of persistence. Two secondary variables, however, were significant predictors among intervention students: 1) the absence of a drop in student's level of enrollment after his/her first semester (e.g., did not drop from full-time to below full-time); and 2) the declaration that one was pursuing an associate's degree. Additionally, when comparing subgroups of intervention students to each other, two models were found to predict persistence with significance.

The second part of the evaluation, a set of exploratory analyses of text responses to open-ended prompts based on Tinto's framework, yielded statistically significant differences in the thinking styles of those intervention students who returned, as compared to those who did not in two LIWC categories: 1) analytic thinking on the challenges/support question; and 2) analytic thinking on the involvement question. Results of a SAS text miner exploration also suggested that there were differences in the ways students wrote about challenges/support and involvement. Recommendations designed to help GPS 4 Success and the institution's leadership promote postsecondary student persistence, along with recommendations for future research, are included.

Acknowledgments

Most importantly, I thank God for seeing me through this arduous but meaningful journey. I vividly remember the hours I spent years ago, deciding whether I should even apply to a doctoral program. I can say now, with confidence, that You already had all of the details worked out. I know that You watched over me throughout this process. My prayer is that my growth both as a person and as an educator will ultimately bring You glory, while helping those who need it most to achieve their dreams.

Thank you also to my committee members—Audrey, Chrissy, and Joseph. Without your guidance, I would not have successfully navigated the dissertation process. Thanks to the McNair Educational Foundation and the National Council for Community and Education Partnerships—Monica, Neil, and Thomas C., in particular. Without your help and the funding of the McNair Educational Foundation, GPS 4 Success would never have come to life. And thank you to Mark, Thomas M., Anthony, and Matthew for your help and encouragement along the way.

I thank my beautiful wife, Elizabeth, for her unwavering commitment to our family as I saw this project to completion. She ensured that we stuck together and continued to grow as a unit over this sustained

period. You consistently provided the stability, encouragement, and no-nonsense conversations that I needed to mentally get over ‘the hump.’ I have persisted largely because of you

To my parents, Tom and Liz, for providing a strong foundation and an appreciation for education that continue to serve me well today. Mom, your quote, “the readers of today are the leaders of tomorrow,” is one that has helped me get through. And to my in-laws, Phil and Bonita, you have supported me far more than you know throughout this process. The four of you have been a great resource to bounce ideas off of, and you have helped me through your sincere (most of the time) interest in my studies. Your love and encouragement in this important endeavor have meant a lot.

To my kids, Chloe and Rowan—through the most taxing of times during this process, I’ve thought of you and your bright futures. I love you both more than you can possibly imagine, and I’m so thankful God has put you in my life. Often, all I needed was to spend a few minutes giggling with the two of you in order to find again the perspective, clarity, and energy necessary to continue to *persist*. May you both recognize that you played a positive and important role in this process and that your own education will serve as a key to your futures!

Finally, thank you both to my professors in the Reich College of Education and to my colleagues in the Appalachian State Department of Mathematical Sciences. I am more grateful than you know.

Dedication

To my grandparents, William and Margaret Weigl. As a kid, Grandpa dragged me out of bed early one morning and shared with me his opinions on the value and importance of an education. I believe that conversation—one I'll never forget—planted the seed that grew into my desire to become an educator.

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Chapter 1: Postsecondary Retention and Persistence

Postsecondary retention and persistence are considered cornerstones of success in American higher education. For individual students, institutions, and the knowledge- and technology-oriented society in which we live, so much hinges on these constructs that today's educational and elected leaders have no choice but to remain intentional about trying to improve them. Yet, even with immense efforts, volumes of published research, and increased budgetary and accountability measures in place, today's retention and persistence statistics often fail to meet the expectations of the American public. Nationwide, over 25% of freshmen at 4-year institutions and approximately half of those at open-enrollment schools such as community colleges do not return for a second year (Berger, Ramírez, & Lyons, 2012; Devarics & Roach, 2000)—a clear reminder that there is still much to be learned about how to increase postsecondary students' educational attainment. While, for a myriad of reasons, such as poor institutional fit and a lack of preparedness for college-level work, some level of student departure is inevitable (Braxton et al., 2014), there is undoubtedly a great deal of *unnecessary* departure that takes place at postsecondary institutions of all types (Braxton et al., 2014, Tinto, 2012a). This unnecessary departure, which will only diminish through well-designed, meaningful analyses of postsecondary retention and persistence (Tinto, 2012a), was the focus of this educational inquiry.

In order to analyze retention and persistence, the meaning of the two terms must be first be understood. This can be problematic, however, as their definitions tend to be conflated when, in fact, they are not the same (Tinto, 2012a). For the purposes of this study, *retention* refers to an institution's ability to retain a student—to keep him/her as a scholar at one particular institution—from one school year to another, and ideally through completion. *Persistence*, on the other hand, refers to the act by a student of continuing in higher education (at any institution) from one school year to another, ideally until s/he has earned whatever qualification s/he is pursuing. This study was a persistence-focused study—one concentrated on students and their progression from first to second year of college. However, as this document will show, the results of this study have the capability of informing some of the important retention-based decisions that leaders in higher education must make.

Conditions for Success

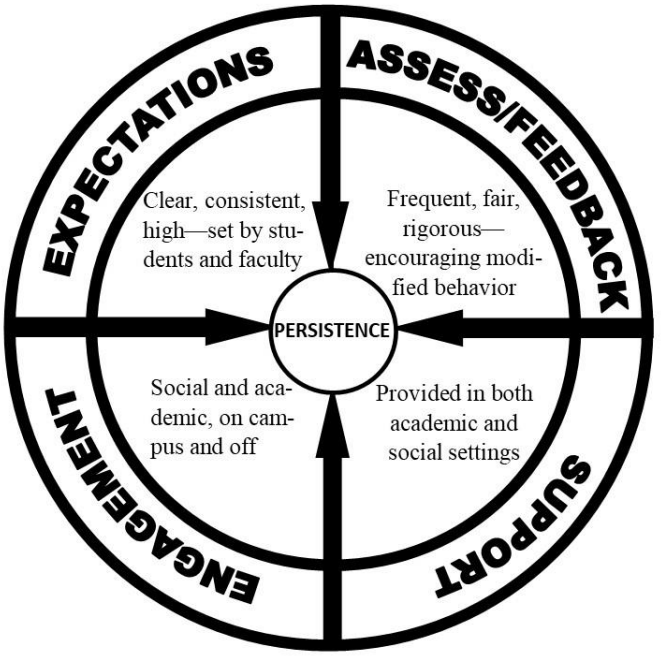
Tinto's (2012a) *Completing College: Rethinking Institutional Action* offers a unique and specific set of supplemental considerations regarding his *interactionalist theory of student departure* (Tinto, 1975, 1987, 1993), which places as much value on the academic and social environments of an institution as it does on the students themselves. Tinto's (2012a) recommendations provide a framework which should be considered one possible way to tackle the retention and persistence

problem within higher education. Specifically, they posit that institutional action intended to improve postsecondary retention and persistence should be based on the following four conditions (Tinto, 2012a):

- **expectations** must be clear, consistent, and high—set by both students and faculty;
- **support** should be provided in both academic and social settings, and also through financial assistance, whenever possible;
- **assessment and feedback** must be frequent, fair, rigorous, and designed to encourage students and faculty to modify behavior in a way that promotes success; and
- **involvement (engagement)** should be encouraged both socially and academically, on campus and off.

Depicted in Figure 1, a figure representing my own interpretation of how the four conditions interact with persistence, these conditions have been shown to have the greatest impact when all four of them are clearly present on campus (Tinto, 2012a). This is particularly true when they exist in the classroom. Though some conditions may be more important to certain students than others (e.g., discussing college expectations may matter most to a first-generation student), "the absence of one undermines the efficacy of the others" (Tinto, 2012a, p. 8).

Figure 1. *Tinto's (2012a) Conditions Which Promote Persistence*



Since a greater percentage of students leave college during or directly after their freshman year than any other (Braxton et al., 2014; Delen, 2011; Tinto, 2012a), the conditions are never more important than in the first year of college. Examples of first-to-second year programs which utilize some of these conditions and have been quantitatively verified as promoting postsecondary persistence include the state of Washington's Integrated Basic Education and Skills Training (I-BEST) program (Rutschow & Schneider, 2011) and City University of New York's (CUNY) Accelerated Study in Associates Program (ASAP) (Linderman & Kolenovic, 2013). I-BEST provides academic support to community college students through embedded technical and vocational

coursework, tailored to what students will need in their future fields (Tinto, 2012a). Its support mechanisms were designed to reduce the need for stand-alone developmental classes. ASAP mandates invasive support services, both academic and personal, and it focuses on a variety of involvement (engagement) activities in order to help students become comfortable with their campus environment and better understand the expectations that they must meet (Linderman & Kolenovic, 2013). These program designs, which clearly utilize Tinto's (2012a) conditions, helped motivate the intervention described and analyzed in this document.

McNair Educational Foundation

The McNair Educational Foundation is a philanthropic organization dedicated to helping secondary and postsecondary students achieve in their educational pursuits. The Foundation works with students in low-income schools in Rutherford County, located in the rural foothills of the Appalachian Mountains in the southeastern United States (Lee, 2014). Among other endeavors, it initiated the Reaching for One's Potential for Excellence (ROPE) award. Graduates from the three Rutherford County public high schools who earn the award may receive $5,600 toward their education at a 4-year institution or $2,800 at a 2-year school. Some of the criteria upon which the ROPE award is granted include taking challenging coursework, setting and achieving goals,

demonstrating citizenship as both a student and a community member, and showing a desire and ability to overcome obstacles (Lee, 2014).

To date, a total of 1,504 students have earned the ROPE award—an average of over 50 per year since 1989. However, the number of Rutherford County graduates who do not earn the award (non-ROPE students) far exceeds the number who do. It is this group of non-ROPE high school graduates who have shown the greatest need for targeted postsecondary services to help them persist.

Need for non-ROPE Postsecondary Support

The McNair Educational Foundation has worked closely with Isothermal Community College (ICC), which serves Rutherford County and its residents, for decades (Lee, 2014). The foundation has collected and analyzed longitudinal data on ICC students, and it has made two important determinations: 1) non-ROPE graduates have enrolled in postsecondary education at rates markedly lower than those who have earned the ROPE award, both at ICC and other 2- and 4-year institutions (Tillery, 2015); and 2) non-ROPE graduates who do enroll have persisted and graduated at rates lower than the national averages for low-income, rural high schools similar to the three located in Rutherford County (Tillery, 2015). In other words, non-ROPE students have performed poorly in their college persistence endeavors, compared not only to their

peers who earn the ROPE award, but also to rural students from similar low-income districts nationally.

GPS 4 Success Persistence-Focused Intervention Study

In response to these findings, the McNair Educational Foundation has extended its work by creating and funding the *Go. Persist. Succeed. 4 Success* (GPS 4 Success) intervention. GPS 4 Success was designed to provide services under each of Tinto's (2012a) four conditions—expectations, support, assessment and feedback, and involvement (engagement). These services are offered specifically to non-ROPE graduates, in hopes of bridging the aforementioned postsecondary success gap between non-ROPE and ROPE students.

GPS 4 Success was initiated during the summer prior to the start of the 2016-17 school year. A total of 174 of the 2016 graduates from the three Rutherford County high schools agreed to participate in the study. They were randomly assigned to either an intervention group or a control group, with the intent of determining the differential impact of receiving the intervention.

The GPS 4 Success study is timely for a number of reasons. First, community college populations are expanding both in enrollment numbers and diversity (Crisp & Mina, 2012). Second, the roles that community colleges play in society are increasingly varied and important (Crisp & Mina, 2012). And third, there remains much to be learned about how to

improve postsecondary retention and persistence, particularly at community colleges (Bailey & Alfonso, 2005; Pascarella, 1999; Tinto, 2012a; Townsend, Donaldson, & Wilson, 2009; Wild & Ebbers, 2002).

Purpose of study.

This inquiry arose out of my desire to ensure that postsecondary students, specifically community college students, have targeted services which help them persist in their educational endeavors. The study was designed to evaluate the impact of the persistence-focused, student-centered GPS 4 Success intervention through small-scale empirical testing of Tinto's theoretical framework, described earlier in this chapter, at an individual institution (ICC). The need for such small-scale, institution-specific studies has been recognized by Braxton et al. (2014) and Tinto (2012a). The analyses were an effort to examine, and ultimately offer insights, to help improve the low rates of retention and persistence for non-ROPE graduates who pursue a postsecondary education. They also represent an attempt to add to the body of knowledge on postsecondary retention and persistence.

Intervention services.

The GPS 4 Success intervention was initially designed to provide four categories of services which align directly with the four conditions outlined in Tinto's (2012a) framework. As mentioned previously, those four conditions are: 1) expectations; 2) support; 3) assessment and

feedback; and 4) involvement (engagement). However, the final design of the intervention implemented only the first three categories of services. The involvement condition was dropped because the anticipated time and resources required to implement it fully was considered too great for the first year of implementation.

Examples of the specific services provided in the final design included, but were not limited to: a pre-college summer workshop (expectations); a GPS 4 Success contract, co-authored by the services coordinator and individual students (expectations); individual counseling sessions linked to course registration, connecting with campus resources, help resolving financial aid and/or student FAFSA issues (support); individual text messaging and/or phone calls (support); monthly contact via mass e-mail, mass text message, and/or social media, offering general intervention group reminders (support); individual face-to-face meetings to assess each intervention student's standing with respect to academic, financial, social, and other aspects of persisting toward completion of a degree or certificate (assessment and feedback); and 2- and 4-year planning help (assessment and feedback). Further explanation, and an outline of the intervention can be found in the GPS 4 Success Operations Manual in Appendix A.

It is worth noting that because the intervention coordinator viewed part of his job as using services to explain to students the value of a

postsecondary education and to help students navigate the enrollment process, services were not withheld from an intervention student who had not yet enrolled. Thus, some students received services without enrolling in college in 2016-17 ($N = 21$).

Study participants and groups.

At the study's inception, there were 174 participants—each a non-ROPE graduate of one of the three public high schools in rural Rutherford County in the southeastern United States. Of the 174 initial participants, 87 were randomly assigned to an intervention group, and the other 87 were assigned to a control group. Each participant expressed the intention to enroll in college for the first time during the 2016-17 academic year. Chapter 4 provides more detail on the study participants.

Primary Research Questions and Methodology

As mentioned previously, this was a persistence-focused study that had the capacity to inform the retention-based decisions that leaders in higher education must make. For the purpose of this study, a student who persisted was one who enrolled either fall 2016 or spring 2017 and either returned fall 2017, graduated with a degree/certificate before fall 2017, or transferred to another 2- or 4-year institution fall 2017. Since persistence is a student-focused term, this definition of a student who persisted is a good fit for this study's focus on persistence (rather than on retention). For example, the allowance for a student who started in the spring semester

and came back the following fall to be counted as having persisted or of a student who successfully transferred to be coded the same way better fits the aforementioned purpose of the study and, in my opinion, made the analyses more likely to account for whether the intervention had an impact on persistence. Noteworthy is that this definition was not intended to match the federally-defined fall-to-fall retention formula, which counts as retained only those students who were first-time-full-time (FTFT) freshmen in one fall cohort and return to the same school the next fall (National Center for Education Statistics, 2017).

The following research questions guided this study:

Research Question 1: Do postsecondary persistence patterns differ significantly among non-ROPE ICC students who received the GPS 4 Success intervention and those who did not?

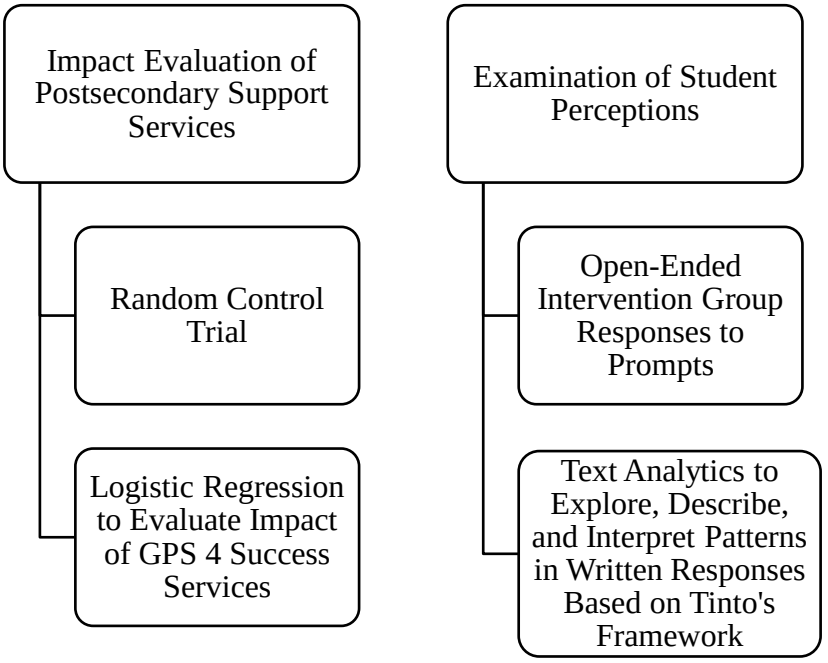
Research Question 2: Within the intervention group, do postsecondary persistence patterns differ significantly among non-ROPE ICC students, based on various groupings (e.g., number and type of services received, degree association, semester-by-semester enrollment status, cumulative high school GPA, gender, race)?

Research Question 3: How do descriptive patterns in written student responses based on Tinto's framework differ between intervention students who persisted and those who did not?

Though this study was persistence-focused, the analyses of quantitative services-based data conducted through Research Questions 1 and 2 certainly have the ability to better inform leaders with respect to how to improve retention. This is true because if a student persists at his/her institution, then that student has been retained by his/her institution. Additionally, the analyses of Research Question 3, which explored, described, and interpreted qualitative data to compare how students thought about topics which are tied directly to Tinto's (2012a) framework, could also inform retention-based decisions, should an institution commit to analyzing text. This is true because, as this document will show, those exploratory analyses have offered potential insights in written responses which might predict a student's return.

The experimental research study was designed as a random control trial (RCT). Students were randomly assigned to either an intervention or a control group. In order to offer a meaningful description of the overall impact of the intervention, one which analyzed both quantitative and qualitative data, the analyses utilized the two-pronged approach outlined in Figure 2.

Figure 2. *Two-Part Data Analyses*



Research Questions 1 and 2 were examined through an impact evaluation using logistic regression. These analyses of postsecondary support services measured the impact of the intervention on persistence by analyzing the year-two enrollment patterns of students through two sets of extant data. First, the freshmen-to-sophomore persistence rates of the intervention group were compared to those of the control group to determine if the intervention caused more students to persist. Second, the freshmen-to-sophomore persistence rates were compared among intervention students exclusively, based on a variety of groupings (e.g., number and type of services received, degree association, semester-by-semester enrollment status, cumulative high school GPA, gender, race), to

determine whether the intervention caused students within various groups to persist at differing rates.

Research Question 3 was exploratory and was answered through supplemental text analyses of student perceptions. For this piece, responses to a survey and set of common prompts (see Appendix B) tied to Tinto's framework were explored through two computer-based text analytics programs. These exploratory analyses compared and contrasted the qualitative responses of two sets of intervention students—those who persisted and those who did not. Through it, I desired to describe and interpret patterns in student responses, in search of variables which might indicate persistence.

Magnitude of the Issue: Postsecondary Retention and Persistence

With respect to educational inquiry as a whole, it is hard to imagine a more important field of study at this time than postsecondary retention and persistence. According to Hagedorn (2012), "from the perspective of higher education, the power to retain students remains the most crucial outcome if students are to be successful in life" (p. 81). Clearly, then, retention and persistence matter in the lives of students and their families. However, these constructs are also critical to institutions and leaders in higher education for a variety of reasons (Fike & Fike, 2008) including, but not limited to, institutional reputation (Delen, 2011; Lynch, Engle, & Cruz, 2011; Summerskill, 1962), financial security

(Raisman, 2013), enrollment planning, and ultimately, their ability to fulfill the mission of creating the best possible future for society. In sum, retention and persistence are key to individuals, institutions, organizations, and America's future, as a whole.

Yet, while it is universally accepted that retention and persistence are important, the most recently-reported 6-year graduation rate of 59.4% for 4-year schools and 3-year graduation rate of 29.1% for 2-year schools leave much room for improvement (United States Department of Education, 2017a). According to Hossler (2005), one reason this may be true is that institutions have not committed enough resources to analyzing whether retention and persistence intervention programs are actually effective. This particular fact presents an important gap that the GPS 4 Success study has explored at the 2-year postsecondary level. The analyses and discussion within this document are timely because as 4-year institutions become more expensive (Thomas & Bell, 2008) and community colleges continue to experience record growth (Barr & McClellan, 2011), the question of how to improve retention and persistence at the community college, a place where the constructs have proven more difficult to improve than at 4-year schools (Crisp & Mina, 2012; Mohammadi, 1996), becomes more critical.

Unique Persistence Challenges that Community Colleges Face

Overall, the community college sector faces unique obstacles with respect to retention and persistence. The greatest current challenge for this sector is that of retaining a uniquely diverse subset of students and motivating them to persist, while still training and educating them in rigorous, innovative, and accessible ways (Crisp & Mina, 2012). Their open admission policies, lack of on-campus residents, high rate of adjunct faculty, and shorter waiting lists, for example, have been linked to lower rates of retention and persistence (Wetzel, O'Toole, & Peterson, 1999). This is exemplified in the fact that nearly 50% of community college freshmen do not return for a second year (Berger et al., 2012; Devarics & Roach, 2000)—a figure which is worse for minority, first-generation, low-income, and other traditionally underrepresented students (Crisp & Mina, 2012). Additionally, the nationwide three-year community college graduation rate has hovered between 20% and 30% for decades (United States Department of Education, 2003; United States Department of Education, 2017a; Tinto, 2012a), and the average time to completion for those 2-year students who actually do complete an associate's degree is just over five years (Tinto, 2012a). Despite these statistics, it is important to consider that for millions of postsecondary students, particularly those from low-income districts, community colleges can offer a path toward social mobility, financial security, and a more promising future (Baum,

Ma, & Payea, 2013; Carnevale, Rose, & Cheah, 2011; Pascarella, 1999). With this for context, the retention and persistence challenges that community colleges face, as well as the implications of measured improvement in spite of those challenges, will be expanded upon in Chapter 2.

Definition of Terms

According to Tinto (2012b), there remains a lack of consensus regarding key terminology in retention and persistence research, largely because no two individual paths through postsecondary education are exactly alike. Therefore, one of the greatest challenges faced by retention and persistence scholars is that of ensuring clarity on the complex terms involved in their analyses. For this reason, it is important that key terms be defined. This section is intended to provide clarity on the following terms, each of which played an important role in this study.

Assessment and feedback—any evaluation, constructive critique, and/or advice that is frequent, fair, rigorous, and encourages students and faculty to modify behavior in a way that promotes postsecondary success (Tinto, 2012a).

Community college—any of the public, 2-year, open-enrollment postsecondary schools which account for nearly 1,300 American postsecondary institutions and educate approximately 40% of American college undergraduate students (Pascarella, 1999). This sector of

American higher education is known for its low cost of attendance and its commitment to traditionally underrepresented groups (Shelley, 2013).

Delayed enrollment—a student who delayed postsecondary enrollment until after the 2016-17 school year (e.g., initially enrolled fall 2017).

Enrolled student—a student who enrolled at a postsecondary institution for the first time either at the start of the fall 2016 or spring 2017 semester.

Expectations—assumptions and suppositions set forth in a clear, consistent, meaningful, and achievable way by both students and faculty (Tinto, 2012a).

Fall-to-fall retention—a FTFT student who enrolls at an institution in a fall term and re-enrolls one year later in the fall term (National Center for Education Statistics, 2017).

First-generation student—a student who is the first of his/her family to attend college (Chen, 2005).

Involvement—engagement of postsecondary students, both socially and academically, on campus and off (Tinto, 2012a).

Low-income high school—a high school where more than 50% of the student body receives free or reduced lunch.

Non-residential school—a college which does not house students on campus (Braxton et al., 2014; Tinto, 2012a). Examples include 4-year commuter schools, many 2-year schools, and nearly all community colleges.

Non-ROPE student—a first-time college student who graduated from a Rutherford County high school and did not receive the ROPE award (defined below) upon high school graduation.

Persistence—the act by a postsecondary student of remaining in school from one school year to another, ideally until the completion of a degree/certificate or transfer to a 4-year institution. For this study, a student who persisted was a student who enrolled either fall 2016 or spring 2017 and either returned fall 2017, graduated with a degree/certificate before fall 2017, or transferred to another 2- or 4-year institution fall 2017.

Retention—the institutional ability to retain a postsecondary student from one school year to another, and ideally from the start of a college career through completion.

ROPE award—a selective award, funded by the McNair Educational Foundation and given to graduating Rutherford County high school seniors. The award is based on a variety of criteria, including academic rigor, the setting and reaching of specific, targeted goals, good citizenship, and a demonstrated ability to overcome obstacles. Recipients are eligible for $5,600 toward their first year at a 4-year school or $2,800 at a 2-year school (Lee, 2014).

Support—academic, social, and/or financial assistance provided to postsecondary students with the aim of promoting persistence (Tinto, 2012a).

Underrepresented student—a student from a group which is traditionally represented at lower rates than others within postsecondary education.

This document is organized into five chapters. Chapter 1 has introduced the topic and study, including its purpose. It has also introduced the study's research questions, methodology, and relevance, with evidence regarding the state of postsecondary retention and persistence in its broader societal context. Chapter 2 provides a review of the literature surrounding postsecondary retention and persistence. Specific attention is given to the two constructs at the community college level. Chapter 3 describes the methodology and techniques used for analyses, along with a rationale for each. Chapter 4 presents the study's descriptive and quantitative results. Finally, Chapter 5 offers a discussion of those results, in addition to recommendations, the study's limitations, and future research suggestions.

Chapter 2: Review of Literature

This literature review explains the need for the GPS 4 Success study. It presents the long-standing and increasingly important roles that postsecondary retention and persistence play in higher education and beyond. The review evolved out of a strategic set of searches, based initially on postsecondary retention and persistence as a whole, then funneled to the community college level. Data were gathered over an extended period of time and from a variety of sources, including books, educational journals, government documents, newspaper articles, dissertations, and personal experience.

Evidence that Retention and Persistence Research Matter

Matters concerning retention and persistence within higher education have institutional, political, legal, student, and social justice implications (Delen, 2011) which have elevated the constructs to ones "permanently established as an educational priority throughout American higher education" (Berger & Lyons, 2005, p. 23). Evidence exists in the following facts:

- there now exists an academic journal, *The Journal of College Student Retention: Research, Theory & Practice*, dedicated solely to growing the body of knowledge in the field;
- more than ever, new key federal, state, and institutional policies are focused on postsecondary retention and persistence; and

- more institutions are now developing retention task forces committed to exploring how to overcome retention challenges.

It is my opinion that the review of literature presented in this chapter suggests that future research on retention and persistence, such as that conducted through the GPS 4 Success study, will play an increasingly important role in higher education, and that this opportunity is particularly meaningful among community college populations.

American Community College System Distinctions

Community colleges serve student bodies with different, often more diverse missions and goals than 4-year schools (Cohen & Brawer, 2008; Crisp & Mina, 2012). As a result, their leaders face unique challenges with respect to retention and persistence, while having the opportunity to positively impact the social, economic, and educational wellbeing of the most enormous and diverse set of American college students of any sector of higher education (Braxton et al., 2014; Tinto, 2012a; Wild & Ebbers, 2002). Working with such a diverse group of students means that community colleges are bound to differ from 4-year schools in many ways (Braxton et al., 2014; Kasper, 2003).

Different populations served.

Community colleges are vastly different than 4-year institutions with respect to their student populations, serving many students who attend school for reasons other than to earn a 2-year degree or transfer to a

4-year school (Kane & Rouse, 1999). For example, community colleges are called to serve and retain the most diverse, often underprepared, and traditionally underrepresented students in American higher education in rigorous, yet accessible ways (Crisp & Mina, 2012). This calling means that these schools represent "the largest and most important portal to postsecondary education" (Crisp & Mina, 2012, p. 147). They are unparalleled, therefore, in their opportunity to help close the performance gap between America's different social classes.

Legitimate mode to social mobility.

Historically, community college student bodies are comprised of higher percentages of students who are minority, first-generation, single parent, academically low-achieving, and from low-income schools than 4-year student bodies (American Association of Community Colleges, 2016; Bragg, 2001; Cohen & Brawer, 2008; Horn & Nevill, 2006; Kane & Rouse, 1999). According to Lareau (2011), these groups tend to have less cultural capital than their 4-year peers, meaning they have fewer non-monetary resources (e.g., an idea of how to seek out support when facing a new challenge, a basic sense of how to successfully navigate college, general shared knowledge which students from college-educated families are more likely to possess) (Sensoy & DiAngelo, 2012; Tinto, 2012a).

Given that students who complete the first half of their postsecondary careers at a community college are just as competitive in

the marketplace upon graduation as others (Pascarella, 1999), community colleges must be recognized as a legitimate mode to social mobility for their student bodies. Carefully-designed experimental studies of community college retention and persistence programs, like the GPS 4 Success study, could therefore positively impact the futures of an already enormous, yet growing percentage of American college students.

Greater economic and financial barriers faced by students.

A key issue hindering opportunities for social mobility for many community college students is the fact that they have been found to face different and often greater economic and financial barriers than their 4-year peers (Linderman & Kolenovic, 2013; Tinto, 2012a). Community college students are more likely to have to work full-time and are less likely to be able to go to school full-time (Braxton et al., 2014; Tinto, 2012a). Fortunately, a number of community colleges have developed creative programs designed to help.

The ASAP program, mentioned earlier in this document, offers tuition gap waivers for students who receive financial aid, often paying for any classes which are not covered by aid (Linderman & Kolenovic, 2013). The program also pays for textbooks and travel to and from school via the New York City subway. On average, its intervention group has a 3-year graduation rate that is 30% higher than comparison-group students. Prince George's Community College (PGCC) offers a deferred tuition program,

allowing students to pay a trivial amount in order to break up tuition payments and use money elsewhere throughout the semester. Implementation has improved retention rates and lowered the institution's default rate from 7% to 3% (Tinto, 2012a). In another example, two community colleges in Louisiana have experimented with offering scholarships which are paid in three increments per semester to students who remain enrolled at least half-time and uphold a minimum 2.0 GPA. Recipients were more likely to register full-time, persist, and earn a higher four-semester cumulative GPA (Richburg-Hayes et al., 2009). Finally, in general, well-designed programs which increase students' financial literacy and financial aid awareness have also been found to promote persistence at the community college level (Tinto, 2012a). Increased awareness and utilization of programs like those mentioned in this section have the potential to help large groups of community college students overcome some of the long-standing economic challenges which have perpetually hindered increased retention and persistence and, ultimately, social mobility.

More responsive to local workforce needs.

In addition to serving students who face different challenges than their 4-year peers, community colleges must often be more responsive to their community's workforce needs than other schools. As a result, they offer a greater variety of developmental education (Kane & Rouse, 1999)

and dual-enrollment programs (Kasper, 2003). They also offer special training and hands-on workforce development (Crisp & Mina, 2012). These programs promote direct alliances with the business sector, offering appropriate social and cultural capital through educational experiences and redirecting the careers of millions of experienced workers (Cohen & Brawer, 2008; Pascarella, 1999). Examples include partnerships like Alabama's work with Microsoft Corporation to offer accredited information technology certificates, Virginia's work with Cisco to form high-tech training centers on nearly 30 campuses, and Arizona's joint venture with non-profit International Genomics to train students in genetics research (Townsend, 2002). Such partnerships have particular potential to impact rural communities, through deliberately-designed training programs which attract new firms and link graduates with business partners (Kasper, 2003). In sum, community colleges represent important incubators for the micro-economies in which they exist.

Defining Community College Retention and Persistence

Traditional theories of college retention and persistence have evolved largely out of research at 4-year institutions (Bailey & Alfonso, 2005; Braxton et al., 2014; Crisp & Mina, 2012; Tinto, 2012a; Wild & Ebbers, 2002). The generally-accepted definitions of the two terms, therefore, are often too restricted and underdeveloped to fully explain student retention and persistence at community colleges, which differ

drastically from 4-year residential schools (Braxton et al., 2014; Wild & Ebbers, 2002). As a result, universally-accepted definitions for the terms at the community college level do not exist.

When funneled to the community college, Walleri (1981) suggested that the definitions might focus on whether a student completes an intended goal, rather than an entire program of study. Similarly, Bean (1990) recommended that if a departing student persists long enough to achieve his/her goals, then both student and institution should be considered successful. Seidman's (2005) definition of retention as "student attainment of academic and personal goals, regardless of how many terms a student [was] at the college" (p. 21) satisfies these recommendations. It states that retention should not be defined based on a number of terms, but rather should be a function of goal realization.

The definitions of *enrolled* and *persisted* which were utilized for this study (see Chapter 1) were influenced by those definitions discussed in the previous paragraph. In my opinion, those definitions better fit the differing goals of community college students, and they also account for the fact that for many community college students, persisting long enough to earn a credential other than a certificate or degree is the end goal (Tinto, 2012a).

Gaps in Community College Retention and Persistence Research

Community colleges educate approximately 40% of American undergraduates (American Association of Community Colleges, 2016; Horn & Nevill, 2006; Pascarella, 1999), and their populations continue to rise largely because of their attractively-low cost as compared to 4-year institutions (Kennamer, Katsinas, & Schumacker, 2010). Yet, only a small percentage of retention and persistence studies are focused on community colleges, as compared to 4-year schools. This is an increasingly important gap worth exploring.

For example, in a review of over 2,000 research articles published in five major higher education journals from 1990 to 2002, just 8% were found to even mention 2-year and community colleges (Townsend et al., 2009). Crisp and Mina (2012) also contended that not enough attention has been given to understanding the unique considerations in retaining community college students. As a result, the research in this area is neither honed nor conclusive (Jeffreys, 2012; Pryjmachuk, Easton, & Littlewood, 2008). Even those few predictive models that have been developed at the community college level have not been validated through other data sets (Bailey & Alfonso, 2005), presenting the issue of limited generalizability. These assertions reveal that there is need for growth in the body of theory-driven community college retention and persistence research (Bailey &

Alfonso, 2005; Crisp & Mina, 2012; Wild & Ebbers, 2002)—a gap the GPS 4 Success study explored.

Just as important as the problem of limited research on retention and persistence at the 2-year level is the issue that traditional theories of retention and persistence were developed almost exclusively through research at the 4-year level (Braxton et al., 2014; Crisp & Mina, 2012; Diel-Amen, 2011; Mohammadi, 1996; Tinto, 2012a; Wild & Ebbers, 2002). Given that financial, demographic, environmental, and other factors are often very different for community college students than they are for 4-year students (Mohammadi, 1996), this is an issue which warrants alternate consideration when researching, planning, and implementing retention strategy at this level.

In a review of the existing research on community college retention and persistence, Bailey and Alfonso (2005) found a number of problems with the information available. They suggested the following:

- national data sets are not explicit as to type of practice/policy used to increase retention, persistence, and success;
- methodology problems abound (e.g., lack of random assignment);
- conclusions often cannot be generalized or trusted;
- there is inadequate discussion and broadcasting of retention and persistence research among community colleges; and
- few tangible insights have resulted from studies.

Alfred, Ewell, Hudgins, and McClenney (1999) also suggested similar key issues hindering community college retention and persistence research. They found that the statistical models which have tried to explain community college retention and persistence are generally neither robust nor validated. Additionally, they suggested that the community college research is not properly grounded in theoretical models—another critique with implications for future inquiry.

Together, these critiques indicate a general need to develop a culture of evidence (Bailey & Alfonso, 2005), in which institutions improve their ability to conduct and utilize research, as even the most commonly-used measures cause confusion and allow for institutional manipulation. This series of gaps indicates a clear and concrete opportunity to improve the body of knowledge through inquiry like that conducted in the GPS 4 Success study.

Implications of Improved Community College Persistence

Higher education embodies a unique and powerful means to confront social injustices (Sawhill, 2012) because those who complete college earn more, participate more in society, have increased opportunities, and in general, have the chance to live a higher quality of life than those who do not (Baum et al., 2013; Carnevale et al., 2011). Of all sectors of higher education, the one with the greatest potential to make a difference may be the community college system. It educates the highest

proportions of minorities, first-generation students, full-time employees, and students who attend part-time (Boylan, Calderwood, & Bonham, 2017). As 4-year institutions become more difficult to afford (Thomas & Bell, 2008), community college enrollments have experienced record growth (Barr & McClellan, 2011). Therefore, programs like GPS 4 Success, which offer targeted services aimed at improving retention and persistence at the community college level, are timely and critical.

Characteristics of Community College Interventions that Work

Successful community college interventions do exist, and their policies should be analyzed. CUNY's Accelerated Study in Associates Program (ASAP), for example, represents an all-encompassing reform effort which offers its students free tuition, books, and transportation, in an effort to enable students to attend full-time (Linderman & Kolenovic, 2013). The program offers a limited number of degree options, mandatory academic and career counseling, smaller-than-normal class sizes, the requirement to engage in a learning community/cohort, and the chance to take summer and winter sessions (Linderman & Kolenovic, 2013). ASAP also serves its students throughout their career at CUNY. The program's goal to graduate half of its students within three years was exceeded with its first cohort, not only with top-tiered students, but with developmental-level learners, as well (Linderman & Kolenovic, 2013). In fact, those who

received ASAP services graduated at a rate 33% higher than the control group.

The state of Washington's Integrated Basic Education Skills Training (I-BEST) program is another example of a community college program which has made a difference in overcoming some of the unique retention and persistence obstacles faced by that sector. It is a data driven program, designed to offer adult education and English language acquisition (Rutschow & Schneider, 2011). At technical and community colleges throughout the state, the program employs two instructors. One teaches reading, writing, digital literacy, math, and employability skills, while the other teaches how to apply those skills in a job setting (Rutschow & Schneider, 2011). I-BEST students have been found nine times more likely to earn a certificate or degree than their peers in traditional basic skills classes (Washington State Board of Community and Technical Colleges, 2017).

Some key similarities between these two successful programs are their offerings of long-term support, their transparent structure to degree completion, their achievable goals, high-quality advising, mandatory incorporated support services, and engagement with the broader institution. Many of these themes have been suggested as keys to success (Bailey, Smith Jaggars, & Jenkins, 2015; Braxton et al., 2014; Tinto, 2012a). Known as guided pathway models, the structure of these two

programs is noticeably and purposely different than most others. They offer a blueprint for GPS 4 Success. However, because they serve urban and suburban community college populations almost exclusively, they also leave space for a study like GPS 4 Success, which was conducted in a rural setting, to add to the general body of knowledge. The foundations of that body of knowledge, along with the most noteworthy praises and criticisms of it, are the focus of the next few sections.

Tinto's and Astin's Theories of Retention and Persistence

According to Metz (2004), the two most often-cited retention theories are Tinto's (1975, 1987, 1993) interactionalist theory of student departure and Astin's (1975, 1985) theory of student involvement.

Tinto's interactionalist theory of student departure.

Tinto's (1975, 1987, 1993) interactionalist theory of student departure is the only theory of retention and persistence to have achieved paradigmatic stature (Braxton et al., 2014). It considers integration into both the academic and social aspects of college life as its key factors, and it places equal responsibility on both student and institution. Tinto's original theory utilized as its framework the ideas of William Spady (Berkman, Glass, Brissette, & Seeman, 2000), who viewed institutions of higher education as individual social systems. Spady (1970), and soon after, Terenzini and Pascarella (1977), suggested that if a student's values

do not align with those of his/her institution and/or campus groups, then s/he is more likely to depart.

Tinto's (1975) first attempt to explain departure from college theorized that there are a variety of different types of dropout behavior, and that those types depend on the ways an individual interacts with his/her school. Tinto's (1975) early work was developed in an era when student retention was studied through dynamic research for the very first time (Berger & Lyons, 2005).

As Tinto (1975, 1987, 1993) refined his interactionalist theory to focus on a student's level of integration at college, he suggested the importance of a strong match between the institution's environment and the student's commitment. Tinto explained that the more fully a student integrated into both the academic and social communities, the more likely the student was to complete his/her postsecondary endeavors (Morrison & Silverman, 2012). Tinto (1975, 1987, 1993) utilized five variables to explain retention and persistence:

- student attributes prior to postsecondary entry;
- a student's institutional commitments and future goals;
- external commitments;
- experience while attending an institution; and
- academic and social integration at the institution.

Based on the work of Arnold van Gennep (1960), a social anthropologist who studied tribal initiation, Tinto (1987) also theorized that postsecondary students experience a form of social puberty, in which they must transition from high school to college. Tinto (1987) posited that, much like new tribal members, students who fully integrate into college go through the following three stages:

- separate from their old community, particularly those who do not value education;
- begin to transition between old and new; and
- integrate into the new community at their institution.

Important contributions of Tinto's theoretical work.

Tinto (1975, 1987, 1993) is credited with a number of novel contributions to the body of research on postsecondary retention and persistence. For example, Tinto's theory created a clear division between academic and social integration (Morrison & Silverman, 2012). Academic integration was defined as taking place during conventional educational experiences (e.g., time in the classroom, time conducting research with a faculty member), whereas social integration was defined as taking place in informal settings (Tinto, 1975, 1987, 1993). The separation of these two types of integration gave researchers a way to differentiate between integration-type in their work (Metz, 2004).

Additionally, Tinto first contributed to the field the idea that a student's match and degree of prior and current academic success influenced his/her level of commitment not only to the institution s/he attended, but also to that student's own academic and career goals (Tinto, 1975). An important implication is that departure should not necessarily reflect negatively on a student because students decide to drop out for a variety of reasons beyond simply flunking out of school (Tinto, 1993).

Tinto's (1993) suggestion that retention rates reflect a measure of an institution's social and academic health was another innovative and thought-provoking consideration for higher education leadership (Morrison & Silverman, 2012). For example, the idea that low retention rates indicate that faculty-student interaction and/or the integration of students into the campus environment need to become a focus for an institution's future improvement was contributed by Tinto (1993). Additionally, Tinto suggested that schools must determine to implement policies which improve the probability that students re-enroll (Tinto, 1993). Ultimately, Tinto revolutionized not only the ways that postsecondary retention and persistence were viewed, but also how they were investigated (Metz, 2004; Morrison & Silverman, 2012). Tinto's (1975, 1985, 1993) ideas have accounted for change both in the design of retention research and in the analyses of its results.

Finally, Tinto's (1975, 1987, 1993) framework challenged researchers to measure integration both formally and informally, and both qualitatively and quantitatively (Braxton et al., 2014; Metz, 2004). His work has benefitted from added variables and constructs through the lenses of other theoretical perspectives (Berger & Lyons, 2005), leading to an increase in explanatory power, most often at 4-year residential schools (Braxton et al., 2014; Metz, 2004; Pascarella & Terenzini, 1991; Seidman, 2012).

Astin's theory of student involvement.

Astin's (1975, 1985) theory of student involvement was one of the first to take root on many American campuses for its simplicity and usability (Morrison & Silverman, 2012). While Tinto (1975, 1987, 1933) focused largely on the integration of a student to his/her college campus, Astin (1975, 1985) concentrated on how and why talent developed among students throughout their postsecondary endeavors (Metz, 2004).

According to Astin (1975, 1985), students need to feel connected and involved on campus. Connections come in the form of relationships with peers and/or faculty, as well as through extracurricular involvement and even living in a residence hall. Astin (1999) defined student involvement as, "the quantity and quality of the physical and psychological energy that students invest in the college experience" (p.

528). Ultimately, Astin (1975, 1985) suggested that students who are more invested in college life are more likely to return.

Astin (1977, 1985) believed that the two strongest predictive factors of postsecondary student retention are personal-experiential, including pre-college characteristics, and environmental. The personal student variables that interested him were academic and family background, educational aspirations and expectations, study habits, age, and even marital status. Environmental variables included institutional characteristics, residential characteristics, academic/study environment, place of employment, and more (Astin, 1985).

Astin (1985) built his theory on the following five assumptions:

- involvement takes physical and psychological energy;
- involvement level can be measured on a continuum;
- involvement can be gauged both quantitatively and qualitatively;
- the value and volume of learning that takes place positively correlates with the quantity and quality of the involvement; and
- effective policies will account for how they impact involvement.

Astin's (1985) work was groundbreaking because it laid out for higher education leaders, researchers, faculty, and even students what it means to be involved (Metz, 2004). While Astin (1999) did suggest that involvement is the responsibility of both the institution and the individual student, his work implied that students ultimately play the lead role in

retention and persistence. Astin (1975, 1985) postulated that students must be active participants, rather than passive observers, and that students who persist are usually more involved. He linked involvement directly to motivation (Astin, 1999; Morrison & Silverman, 2012), suggesting that level of involvement impacts one's learning, development, and the likelihood of persistence (Astin, 1999).

Astin (1999) explained that involvement may take on many forms, including extracurricular activities, work with faculty members, small group or cohort work with peers, and a job on campus. A major contribution was his finding that work-study financial aid was an involvement-based variable that heavily influenced persistence in a positive direction (Metz, 2004).

Astin's student involvement theory was innovative because it focused neither on course topics nor methods of instruction, but on level of involvement. Astin (1999) suggested that as institutions shape their futures, they ought to make decisions through the lens of how it will impact the overall involvement of the student body. Specifically, leaders must ask whether their institution's practices will increase student involvement or not (Astin, 1999).

Criticisms of Retention and Persistence Research

The research gaps and critiques detailed earlier in this chapter are unique to research on retention and persistence at the community college

level. The next few sections, however, reveal the most relevant criticisms specific to Tinto's theory, as well as the comprehensive body of research.

Critiques of Tinto's theory of student departure.

Tinto's theory has undoubtedly benefited the body of knowledge on postsecondary retention and persistence, both directly through Tinto and indirectly through empirical testing by other researchers in various settings (Braxton et al., 2014; Metz, 2004). In fact, much of the work on retention and persistence over the past thirty years has consisted of testing and/or revision of Tinto's ideas (Metz, 2004). It should be expected, therefore, that Tinto's work has received its share of criticism, as well.

Expansion necessary to fit commuter and community colleges.

The major principles and assumptions of Tinto's theory are based on research at 4-year residential schools (Bailey & Alfonso, 2005; Wild & Ebbers, 2002). As a result, the most notable critique of his work is that it is poorly-suited for non-residential schools and non-traditional students.

In a test of this critique, Braxton et al. (2014) conducted empirical research. They determined that Tinto's theory of student departure lacks explanatory power at both 2-year schools, particularly community colleges, and at 4-year commuter schools. Because students at these schools face common persistence-related challenges found to be different than those faced by 4-year residential students (Braxton et al., 2014), the

researchers developed a separate theory of student persistence for commuter and community colleges.

The theory (Braxton et al., 2014) accounts for the fact that the social communities and external environments which exist at these schools are far different than at residential institutions. Specifically, the need for social affiliation was found not to be as strongly correlated to student persistence at community colleges and commuter schools as suggested by Tinto. With respect to student entry characteristics, the theory utilizes traits such as high school achievement, sense of self-efficacy, level of empathy, need for control, social involvement, parent education level, and motivation to graduate from college (Braxton et al., 2014). It uses these variables because they were found to play the most important roles in commuter student persistence. These key differences, along with the fact that community college and commuter students often deal with external forces (e.g., full-time work, family obligations) at higher rates, make it more difficult for them to integrate and mature into contributing members of their institutions than Tinto's theory recognized (Braxton et al., 1997; Braxton et al., 2014).

Others have also critiqued Tinto's theory for a lack of fit outside of traditional students. Bean (1980), and later Bean and Metzner (1985) explained that non-traditional students do not integrate into their college environments to the same degree, nor in the same way, as their traditional

classmates. They developed a non-traditional student retention theory, adapted from Tinto. It uses age, enrollment status, educational goals, gender, ethnicity, and high school performance as key variables (Metz, 2004). Bean and Metzner (1985) argued that environmental factors like finances, employment demand, family commitments, and external encouragement, rather than social variables, had the most direct impact on these students' persistence.

Pascarella (1999) also attempted to understand learning and cognitive development at 2-year schools. He posited that a dominant peer group and specific career goals have a strong positive influence on retention, and that students with those attributes are more likely to complete a course of study. These suggestions have important implications for community colleges, which are almost exclusively non-residential (Braxton et al., 2014).

It has been proposed that one reason Tinto did not put more effort into analyzing commuter and 2-year schools early on is because around the time that Tinto began to develop his theory, these schools were experiencing intense criticism, and they were even considered second-rate institutions (Metz, 2004). Given the fact that community colleges are now recognized as a legitimate mode to a better life for those students who complete a certificate or degree (Levinson, 2005; Pascarella, 1999), the GPS 4 Success study was designed to empirically test Tinto's (2012a)

newest framework—one which I believe can be molded to fit any institution-type.

Revision of 4-year residential model needed.

Though Tinto's theory has received praise for its fit at 4-year residential schools (Braxton et al., 2014; Metz, 2004; Pascarella & Terenzini, 1991; Seidman, 2012), it has been suggested that there remains room for improvement of the theory at that level, too. Most notably, Braxton et al. (2014) argued that persistence is affected by variables outside of academic and social integration. Specifically, they found that a student's perceptions of the level of institutional integrity, the commitment of his/her school to the student's overall welfare, the degree of academic and personal development of self, and whether s/he is able to attend full-time are the variables which most affect persistence (Braxton et al., 2014). Ultimately, they determined that persistence is more likely when an institution leverages this knowledge into policies and interventions which fulfill a student's needs and desires in these areas—an assertion explored in greater depth later in this chapter.

One longitudinal study of dropouts in the United States found another important opportunity to revise Tinto's theory. Ishitani and DesJardins (2002) determined that the theory does not fully account for changing circumstances. Their results suggested that those variables which affect retention and persistence change constantly, and that Tinto's (1975,

1987, 1993) theory does not adjust for changes in the effects of variables over the course of a college career. For example, the offer of financial aid in a student's third year of college was found to have a greater impact on student persistence than it was during one's first year (Ishitani & DesJardins, 2002). Thus, Tinto's theory inadequately assumes that the impact of a variable remains constant over time.

Potential misuse of lenses.

Finally, the lenses through which Tinto developed his theory have been challenged, as well. Specifically, Bean (1983) developed his own student attrition theory. Rather than utilizing Tinto's lens of institutions as individual social systems, it uses the lens of a work organization and compares departure to turnover in a work setting (Bean, 1983). Bean's theory considers background variables, such as a student's home environment and his/her intentions, as the key factors in retention and persistence. Bean argued that students' beliefs, rather than their level of integration, mold their attitudes and are the best predictors of persistence. Specifically, Bean's theory analyzed the relationship between reward structure and student persistence, and it became the basis for a number of other studies. However, in the analyses of these studies, it failed to account for much of the variance in dropout, and has therefore received a great deal of criticism, itself (Berger & Lyons, 2005).

Additionally, Tierney (1992) challenged Tinto's use of Gennep's (1960) tribal initiation as a lens. He claimed that Tinto misunderstood Gennep's ideas on social puberty, and that programs and interventions designed to improve retention and persistence through this lens could have unintended consequences with a unique capacity to harm minorities. Tierney (1992) suggested that Tinto's (1975, 1987, 1993) theory does not account for the fact that minorities and other non-traditional students do not often identify with mainstream culture or the values of most American 4-year institutions, which keeps them from being initiated in the ways Tinto's theory suggests (Tierney, 1992).

Critiques of the body of retention and persistence research.

The comprehensive knowledge on postsecondary retention and persistence contains a great deal more than the theory of student departure. The next sections reveal some of the relevant critiques of the entire body.

Key definitions and terminology need revision.

One criticism of the broad body of knowledge is that much of the theory uses the same, often ambiguous, definitions and measures to describe and test retention and persistence at all levels (Hagedorn, 2012; Wild & Ebbers, 2002). As a result, many of the variables and constructs are not defined explicitly enough to design straightforward research projects with testable hypotheses (Burnsden, Davies, Shevlin, & Bracken, 2000).

For example, the term dropout is considered by many to be a broad term used in many studies to misclassify a subset of students who do not truly intend to dropout for good (Bonham & Luckie, 1993). In this case, the body of knowledge stands to benefit if researchers differentiated between students who dropout permanently, those who stopout and are uncertain if they will return, and those who optout with the intention of eventually returning. If institutions agreed to break the term dropout into these three separate terms, then they would be likely to report more meaningful retention data (Bonham & Luckie, 1993). This point demonstrates that educational researchers must continue to revamp retention- and persistence-based definitions to fit the changing characteristics and needs of postsecondary student bodies and the variety of institutions that they attend (Braxton et al., 2014; Metz, 2004).

Difficult to measure and analyze.

A consequence of the aforementioned ambiguous terminology is that retention and persistence data is often challenging to measure and analyze (Braxton et al., 2014; Diel-Amen, 2011). According to Hagedorn (2012), "there remains little agreement on the appropriate measure of a standard formula for the measure of college student retention, regardless of institutional type" (p. 81). This lack of agreement in formulae often keeps researchers from confidently asserting which variables best predict retention and persistence (Hagedorn, 2012), and it has led to mixed

empirical results, particularly at commuter schools and community colleges (Braxton et al., 2014; Diel-Amen, 2011). Given that postsecondary institutions are required by law to report retention and completion data to government agencies, this is problematic (Hearn, Jones, & Kurban, 2013).

The retention formulas which are most often used are based only on whether first-time students who begin with a fall cohort and seek a degree or certificate re-enroll at the same institution the following fall (Hagedorn, 2012). Known as fall-to-fall retention, this is considered a poor fit at the 2-year level, where students interact differently with their environments than their 4-year peers (Braxton et al., 2014; Tinto, 2012a) and are often in school to complete some series of courses, rather than a degree, which will enable them to begin work (Kane & Rouse, 1999; Seidman, 2012; Wild & Ebbers, 2002). It seems reasonable, therefore, that community colleges should measure and report retention differently than 4-year schools.

Some community colleges support the use of the successful course completion ratio (SCCR), a simple ratio of number of courses passed divided by total number of enrolled courses. Others use ratios which can be computed over different time periods and using different variables (Hagedorn, 2012). Ultimately, the lack of a universal formula leaves room

for liberal interpretation and thus, inaccuracies, and variation in how rates are calculated.

With respect to completion, problems also exist in how it is operationalized. The United States federal government's formula, as defined through the Student Right-to-Know and Campus Security Act (Pub. L 101-542), is the percent of full-time, first-time, degree-seeking students who graduate within 150% of the time-frame for normal completion (six years for 4-year students and three years for 2-year students) (Hagedorn, 2012). At the community college level, this '150% rule' is problematic because higher percentages of part-time and traditionally underrepresented students—groups found to take longer to graduate—are served at that level (Tinto, 2012a). As a result, the definition makes community college retention and completion rates appear more dismal than they realistically are because it does not allow community colleges to account for long-term persistence and completion (Tinto, 2012a). Instead, a six-year allowance for community colleges would likely provide more accurate and meaningful retention and completion rates (Tinto, 2012a).

Additionally, the federal formula provided in the previous paragraph excludes transfer students, part-time enrollees, students not specifically working toward a degree, students who begin coursework sometime other than the fall, and undeclared students (Hagedorn, 2012).

Because the percentage of community college students falling within these categories is high (Tinto, 2012a), the federal definition is less suitable and more difficult to operationalize and report at that level.

More institution-specific research needed.

Each of the previous criticisms of the greater body of retention research point to the critique most relevant to the GPS 4 Success study—that the body of knowledge is in need of more institution-specific research (Braxton et al., 2014; Metz, 2004; Tierney, 1992; Tinto, 1993; Tinto, 2012a). In reality, each school has its own unique set of circumstances and challenges. Tinto (2012a) argued that while the body of knowledge offers different frameworks through which to conduct research, schools stand to benefit greatly if they commit to testing hypotheses at their own institutions and through their own lens. Additionally, institution-specific analyses using both quantitative and qualitative modes of inquiry have the ability to offer more well-rounded answers for individual institutions (Bailey & Alfonso, 2005; Tinto, 2012a).

This argument for institution-specific research validates the efforts put into planning, measuring, and analyzing the GPS 4 Success study. Using Tinto's (2012a) four conditions outlined in Chapter 1 to promote persistence: 1) that expectations set by both faculty and students must be clear, consistent, and high; 2) support should be provided in both academic and social settings; 3) assessment and feedback must be

frequent, fair, rigorous, and designed to encourage students and faculty to modify behavior to promote success; and 4) involvement (engagement) should be encouraged both socially and academically—on campus and off, the GPS 4 Success study has provided a means to provide and analyze the impact of specific services on retention, persistence, and ultimately completion on non-ROPE students attending ICC.

Strengths of Retention and Persistence Research

The body of research has some noteworthy strengths, as well. For example, it is now nearly 100 years old, and is therefore longstanding and deep-rooted (Seidman, 2012). This is a result of the fact that the challenges of retention and persistence have been recognized as important by educational and elected leaders, policymakers, and even the general public for a long time (Cabrera, Burkum, La Nasa, & Bibo, 2012).

Second, continued efforts in the field have been empirically justified (Braxton et al., 2014). Though public funding is often scarce, the research moves forward because leaders in and out of higher education recognize that retention and persistence directly impact the futures of many stakeholders. One illustration is found in the fact that retention rate is considered one of fourteen core indicators of institutional effectiveness (Alfred et al., 1999).

Influence on programs and acts of legislation.

A direct result of the strengths of the body of retention and persistence research is that it has a far-reaching influence. For example, the study of retention and persistence has encouraged and informed the creation, design, and funding of a number of student assistance programs and acts of legislation. Some programs include Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), TRIO, and Title I (Cabrera et al., 2012). Recent acts of legislation include the Every Student Succeeds Act of 2015 (United States Department of Education, 2017b), which replaced the No Child Left Behind Act of 2002, and the Higher Education Opportunity Act of 2008, an update and reauthorization of the Higher Education Act of 1965 (United States Department of Education, 2010). These programs and legislative acts have been purposely designed in part to improve upon postsecondary success through retention and persistence by increasing opportunities to gain educational, social, and cultural capital, particularly for low-socioeconomic status students (United States Department of Education, 2017b). In part, they enhance access to college application information, provide help with the skills necessary to persist upon matriculation (Cabrera et al., 2012; United States Department of Education, 2017b), and support and grow local evidence-based interventions found to promote

success from preschool through college completion (United States Department of Education, 2017b).

Influence on institution-level strategy.

The body of research on retention and persistence has had an influence at the institution level, as well. For example, it has informed the development of orientation, student-development, academic support, and summer-bridge programs, in addition to the use of educational communities within the classroom (Cabrera et al., 2012; Tinto, 2012a). Each of these are aimed at helping students persist and achieve their goals once they arrive on campus.

Additionally, it has been found that the right combination of smaller, tailored policy levers are more likely to affect positive change than broad, large-scale ones (Braxton et al., 2014; Hossler, 2005; Pascarella & Ternzini, 1991). These levers should be theory-driven programs which address an institution's unique challenges and can be empirically-tested and adjusted accordingly (Braxton et al., 2014). The following sections highlight some of the suggested foci of such institutional levers. Each hints at the role that small interventions focused on Tinto's conditions—like GPS 4 Success—could play in improving retention and persistence (Braxton et al., 2014; Tinto, 2012a).

Engagement.

According to Braxton (2000) and Doyle (2010), institutions can improve retention while being less selective if they focus greater energy on engagement (Braxton et al., 2014). This implies that students rarely leave simply as a result of flunking out. Instead, they leave far more often due to a lack of involvement or as a result of feelings that those on campus with whom they spend the most time (e.g., professors and advisers) do not value their success (Braxton, 2000; Doyle, 2010). Because one of Tinto's four conditions for improved retention is engagement, campus-based interventions like GPS 4 Success have the ability to make a difference in retention rates.

Institutional integrity and commitment to student welfare.

Evidence also suggests that a message institutions must send if they are to improve retention is that they hold a clear commitment to institutional integrity and student welfare (Brier, Hirshy & Braxton, 2008; Braxton et al., 2014). There are a number of ways that schools can meet these goals. One is to provide high-quality academic advising (Braxton et al., 2014). Excellent advising is a simple way for institutions to show that they genuinely care about their students' academic growth and intellectual development (Braxton et al., 2014). This is particularly crucial at 2-year and commuter schools, where higher percentages of students work full-

time (Braxton et al., 2014) and could benefit from advising at odd times (e.g., after 7pm, weekends).

For additional context, it is worth noting that 50% of all first-year students feel uncertain about what degree they want to pursue (Gaffner & Hazler, 2002), and that uncertainty in degree is highly associated with unnecessary departure (Lewallen, 1993). This implies that a high percentage of students require informed advising. One service offered by the GPS 4 Success intervention is that of high-quality advising, focused on subjects like 2- and 4-year academic planning and navigating financial aid challenges.

Another way to commit to student welfare is to increase opportunities for students to work closely with professors. Evidence suggests that those students who are engaged at high rates with full-time, tenure-track professors, particularly within the first two years of postsecondary attendance, are more likely to persist (Ehrenberg & Zhang, 2005). Institutions would be wise to commit resources to ensuring that students are engaged with professors, which institution-level interventions like GPS 4 Success can do.

With respect to specific services, a number have been found to communicate institutional commitment. One example is a call center designed to contact every first-year student during the fourth or fifth week of the fall semester (Brier, et al., 2008). These centers ask students about

their experiences thus far, both social and academic, in an effort to gauge whether the student's needs are being met. A caller might refer a student who indicates uncertainty or unhappiness to the proper support services at the school, then hold a follow-up conversation either later in the semester or the following term. Harris and Goldrick-Rab (2010) found that call centers which made phone calls to students who have either been found not to attend class at all or to drop off in attendance as the semester continues produced the highest effectiveness-to-cost ratio of a number of interventions analyzed.

First-year focused.

Generally speaking, a student will leave sometime during or directly after his/her freshmen year if s/he is going to leave at all (Delen, 2011; Tinto, 2012a). Given this fact, it is not surprising that first-to-second-year persistence is highly correlated with eventual completion (Strauss & Volkwein, 2004). For these reasons, the retention-based statistic of greatest concern to institutional leaders is often the freshmen-to-sophomore retention rate (Delen, 2011; Tinto, 2012a). Institutions, therefore, must offer targeted services which help first-year students if they are to improve on retention.

A first-year focus encourages universities to orient students to campus more fully and quickly (Tinto, 2012a). It also fosters earlier intervention, which provides the greatest chance to prevent unnecessary

first-year departure (Strauss & Volkwein, 2004). One popular program which engages first-year students is the first-year experience course (Tinto, 2012a). It brings together first-year students, combining them with professors who are aware of the importance of getting students connected to campus life, the community, and peers. Leaders at both the community college and the 4-year level have found that these courses help students better understand expectations, increase engagement on campus and in the community, and lead to a greater likelihood of persistence to a second semester and a second year (Tinto, 2012a).

Influence on institution financial health.

Institutions must also focus on retention and persistence out of financial necessity (Barr & McLellan, 2011), as schools rely heavily on student tuition to pay their bills (Raisman, 2013). Every non-returner represents permanently-lost revenue necessary to fund institutional operations and, ultimately, to survive (Berger et al., 2012; Raisman, 2013).

In addition to enhancing the financial health of an institution, improved retention has been found to minimize the use of important resources through simplified enrollment planning, academic programming, the recruitment of students, and campus budgeting (Braxton, Hirschy, & McClendon, 2004). High retention rates lower both the student default-rate burden and the collection costs that schools strive to minimize (Braxton et al., 2004). Schools which report high retention and/or gains in

it create for themselves an important competitive advantage that separates them from others, with respect to financial security.

Influence on public perception and institutional reputation.

The general public has come to recognize retention rates as reflective of school quality (Berger et al., 2012; Hagedorn, 2012). According to Wellman (2001), "in the age of consumerism and public transparency, accountability is necessary for preserving the compact between higher education and society" (p. 48). Students and their families feel most comfortable attending those institutions which boast the highest rates of retention (and completion).

To the public, retention and completion rates ultimately reflect both an institution's ability to integrate students into campus life and the overall learning that takes place at a school. For example, the United States Department of Education's *College Scorecard*, an interactive website designed to provide potential students and their families with cost and value information to help them decide where to enroll, represents an effort by the federal government to hold schools accountable for what they claim to offer (United States Department of Education, 2013). Two key indicators on each school's scorecard are graduation rate and percent of students who return after their first year. Additionally, rankings published by entities like *U.S. News and World Report* suggest to potential students and their families whether an institution is a good investment, in part by

revealing whether it succeeds at retaining students and helping them persist and complete (Berger et al., 2012; Hagedorn, 2012). Ultimately, examples such as these demonstrate that institutional reputation and ranking are tied directly to retention and persistence, both by the popular media and the general public (Delen, 2011; Lynch et al., 2011).

Value of Persistence to Students

Persistence matters to students, as well. Those who depart unnecessarily may eventually lead much different lives than if they had persisted. For example, the appropriate social and cultural capital, or the shared knowledge which helps a person move from one social class to another, are often gained through the educational experiences, skills, and discipline developed in the process of completing a degree (Baum et al., 2013; Carnevale et al., 2011). Additionally, personal factors, particularly economic, psychological, and sociological, can be altered and improved through persistence (Tinto, 2012a). Social cognitive theory, for example, suggests that one's feelings about his/her abilities impacts his/her willingness to attempt difficult tasks (Bandura, 1995). This, in turn, impacts future performance, particularly with respect to one's willingness and desire to persist, both during college and after (Tinto, 2012a).

From a purely financial perspective, persistence has been linked to higher salaries at every level of college attainment, and in most sectors of the workforce (Carnevale et al., 2011). For example, any persistence, even

in instances where a student does not complete, has been linked to as much as $250,000 greater lifetime earnings (Carnevale et al., 2011). Those who obtain an associate's degree can expect a 15% to 27% annual pay increase over a high school graduate. Additionally, individuals who persist and/or complete experience lower unemployment rates, greater opportunities for social mobility, and better non-salaried benefits (Kane & Rouse, 1999).

Benefits of Retention and Persistence to Communities and Society

Retention and persistence benefit broader society, as well (Braxton et al., 2014; Tinto, 2012a). Retained students drive the local economies in the communities which house institutions because they live, work, and serve there. On a larger scale, American society realizes increased tax revenue from better paying jobs, decreased dependence on government aid, lower healthcare costs, and increased workforce flexibility when students persist (Baum et al., 2013; Schuh & Gansemer-Topf, 2012). Additionally, elevated levels of persistence have been linked to a higher quality of life for many stakeholders through increased participation in society, improved literacy and awareness, more active citizenship, greater critical thinking, an increased appreciation for diversity, and reduced crime (Baum et al., 2013).

Implications of Improved Retention and Persistence on Social Justice

The *social justice* movement is one which works toward "fairness and equality for all people and respect for their basic human rights," (Sensoy & DiAngelo, 2012, p. xvii). The movement operates under the assumption that society is divided and unequal for different groups of people (Anyon, 2008). Given that social inequality in the United States is on the rise (Sawhill, 2012) and the lines between social classes continue to harden (Thomas & Bell, 2008), it becomes increasingly important that leaders think critically about how higher education may help eliminate some of the root causes of increased inequality and decreased social mobility. Measured improvements in postsecondary retention and persistence ought to be one key driver of that conversation. Leaders have both the opportunity and the obligation to use postsecondary retention and persistence as a vessel to help correct the state of social inequality in America. It seems reasonable, therefore, that any program designed to empirically test whether its services improve retention and persistence should demand the attention of institutions and other stakeholders. GPS 4 Success represents one such program.

Conceptual Framework

Tinto's (2012a) most recent work, *Completing College*, brings together decades of his own research, even acknowledging his greatest critics. The text's four conditions—expectations, assessment and

feedback, support, and involvement (engagement)—represent the conceptual framework for this study. Individually, these conditions offer key areas for focused inquiry. Collectively, they provide a logical means for leaders to organize action through targeted policies and services designed to positively impact retention and persistence—one flexible enough to be molded to fit unique populations.

Research Motivation

While no single set of isolated factors can guarantee improved retention and persistence, continued efforts regarding their analyses are necessary, particularly at community colleges. One indication is the recently-reported national freshman-to-sophomore retention rate of 55% at that level (American College Testing Program, 2015). This statistic illustrates that while the research on retention and persistence has evolved, the search for answers must continue.

Though college access in the United States has improved for low-socioeconomic, minority, and first-generation students (Thomas & Bell, 2008; Tinto, 2012a), "we have not yet been successful in translating the opportunity access provides into college completion" (Tinto, 2012a, p. 4). Retention, persistence, and completion rates for these same groups leave much to be desired (Gamoran, 2008; Thomas & Bell, 2008). Given that community colleges serve these students at high rates (Crisp & Mina, 2012), there is clearly a need for an increased focus on retention and

persistence at that level. These facts, combined with the notion that a student's decision to persist or not impacts stakeholders beyond him/herself, shape the conversation as a social justice issue which leaders must confront with a sense of urgency.

By answering the three primary research questions, this study was designed to provide information on whether GPS 4 Success, in its first year, helped retain a group of students who have been found to persist at low rates, even offering information on how study participants view the challenges they are up against as they pursue a certificate or degree, through analyses of text. The study is fitting, given the fact that community college populations continue to expand both in enrollment and diversity (Crisp & Mina, 2012), that the roles community colleges play in society are increasingly varied and important (Crisp & Mina, 2012), and that current solutions to community college retention and persistence leave much to be desired (Bailey & Alfonso, 2005; Townsend et al., 2009; Wild & Ebbers, 2002). The intervention planning and methodology have been documented, and the study is therefore be able to be replicated or adjusted.

Summary

This literature review has revealed a myriad of ways that retention and persistence matter not only to institutions of the 2- and 4-year variety, but also to their students, and to the future of society. In doing so, it has shown that the ability to retain students and help them persist is arguably

one of the most fundamental outcomes that leaders in higher education must pursue (Hagedorn, 2012; Tinto, 2012a).

Ultimately, the review has justified the general need for postsecondary institutions to commit resources to empirically analyze the effectiveness of theory-guided intervention programs and services which might promote retention and persistence (Braxton et al., 2014; Hossler, 2005). Given this need and the unique challenges that community colleges face with respect to retaining their diverse student populations and helping them persist (Berger et al., 2012; Braxton et al., 2014; Crisp & Mina, 2012; Tinto, 2012a), the review has demonstrated the need for studies like the GPS 4 Success study and the potential value that this study stands to offer myself, as a researcher, the intervention coordinator, the McNair Educational Foundation, ICC leadership, and the body of knowledge on retention and persistence, as a whole.

Chapter 3: Methodology

After re-introducing the research questions, Chapter 3 describes the GPS 4 Success research setting and context, including examples of the year-long combination of services that a student provided the intervention might receive. Next, the chapter explains the two-part research methodology, justifying each of the methods used for analyses. Finally, threats to validity are addressed.

Research Questions

The following research questions guided this study:

Research Question 1: Do postsecondary persistence patterns differ significantly among non-ROPE ICC students who received the GPS 4 Success intervention and those who did not?

Research Question 2: Within the intervention group, do postsecondary persistence patterns differ significantly among non-ROPE ICC students, based on various groupings (e.g., number and type of services received, degree association, semester-by-semester enrollment status, cumulative high school GPA, gender, race)?

Research Question 3: How do descriptive patterns in written student responses based on Tinto's framework differ between intervention students who persisted and those who did not?

As stated previously, this was a persistence-focused study—the results of which have the ability to meaningfully inform retention-based

leadership decisions. Research Questions 1 and 2 were designed to measure the effect of the intervention services. Research Question 3 was written to explore the descriptive patterns of community college student responses to prompts tied directly to Tinto's (2012a) retention framework.

Research Setting and Context of Study

ICC is considered a medium-sized rural community college, based on its Carnegie classification for geographic location and student body size of approximately 2,900. Its main campus is located in Rutherford County in the southeastern United States. According to the United States Census Bureau (2015), the county's 2015 population was approximately 66,390—a 2.1% decrease from its 2010 population. With respect to demographics, 87.2% of Rutherford County residents are Caucasian, 16.2% have earned a Bachelor's degree or higher, and the median household income is $35,630 (United States Census Bureau, 2015). The United States Bureau of Labor Statistics (2015) listed Rutherford County's unemployment rate at 7.8%—comparatively higher than both the 2015 state and national averages of 5.7% and 5.3%, respectively (United States Bureau of Labor Statistics, 2015).

The ICC mission statement declares, "As an integral community partner, [Isothermal Community College] exists to improve life through learning by providing innovative, affordable educational programs and offering opportunities for personal, professional, economic, and cultural

development" (Isothermal Community College, 2016). This statement aligns with the overarching mission of American community colleges—to serve well the most diverse group of students in American higher education as a gateway to postsecondary education (Crisp & Mina, 2012).

Impact Evaluation of Support Services Research Design

As mentioned in Chapter 1, the GPS 4 Success study employed an experimental random control trial (RCT) to answer Research Questions 1 and 2. This means that participants were randomly assigned to either an intervention or a control group before services were initiated. This step controlled for selection bias (Suter, 2012). It allowed me to utilize a manipulated independent variable, the GPS 4 Success intervention, in an attempt to uncover and justify causal effects. The RCT design was chosen for its ability to substantiate whether or not an intervention is effective. In this case, the goal was to answer whether GPS 4 Success services impacted postsecondary persistence.

Design assumptions.

One requirement of the RCT design is the random selection of an intervention and control group. This condition controls for bias. A second requirement of this design is that the research team will attempt to ensure that intervention group participants receive the designed intervention and that control group participants do not. However, as part of the design, control group participants were able to participate in and receive the

normal supports that ICC offers to its student body (e.g., ICC academic advising)—known as a business-as-usual approach.

Intervention group.

At the study's inception, the intervention group consisted of a total of 87 randomly-assigned non-ROPE high school graduates, some from each of the three aforementioned Rutherford County district high schools. Over the course of the 2016-17 school year, six intervention students dropped out of the study. Of the 81 who remained, 33 matriculated to ICC during the 2016-17 school year, receiving some combination of one or more GPS 4 Success intervention services.

The range of services offered included face-to-face services such as course registration counseling, financial aid counseling, 2- and 4-year planning help, and an expectations contract discussion, in addition to group text message reminders and individual text message correspondence. Not all students who received the intervention got the same combination of services. Therefore, the experience was not identical for everyone.

Control group.

The control group consisted of another randomly-assigned 87 non-ROPE high school graduates. Out of this group, 47 enrolled at ICC during the 2016-17 academic year.

Logistic regression.

The impact evaluation of postsecondary support services sought to answer Research Questions 1 and 2 by analyzing the impact of GPS 4 Success services on student persistence using logistic regression. Logistic regression is a statistical technique utilized when a data set has two very specific characteristics: 1) a single categorical target (dependent) variable which is dichotomous—that is, it has only two possible outcome values; and 2) one or more input (independent) variable(s), which may be either categorical or continuous (DeVeaux, Velleman, & Bock, 2008; Pallant, 2007; Wright, 1995). Since the target variable in the GPS 4 Success study had just two possible categories—persisted/did not persist—and some of the input variables were categorical, while others were continuous, logistic regression was employed for the impact evaluation of postsecondary services.

Data collection and participants.

All data pertaining to the postsecondary support services impact analyses were de-identified and extant data which were provided through the McNair Educational Foundation. The data came from two separate sources. The first provided details on those individual interactions that took place between intervention students and the services coordinator. For example, it offered information on the type (expectations, assessment and feedback, or support), and duration of each individual intervention given

throughout the entire 2016-17 ICC school year, in addition to demographic information on each student. Each individual service was represented by a single row in this set and was matched with the unique identifier of the student to whom it was given.

The second source of data, collected from the National Student Clearinghouse (NSC), provided postsecondary data on each participant on a semester-by-semester basis. For example, a student who never matriculated would be represented by a single line in the file and identified as having no record of college attendance. A student who attended the entire 2016-17 school year, took a summer 2017 class, and returned in fall 2017, on the other hand, would be represented by four lines in the data set, whereas a student who matriculated in fall 2016, stopped-out in spring 2017, then returned in fall 2017 would be represented by two lines—one for each semester of attendance. This file reported a number of variables for each semester of attendance, such as status of student attendance (e.g., full-time, three-quarter-time, half-time) and type of degree sought.

The two data sets were merged in order to conduct the impact analyses. For the entirety of the study, all GPS 4 Success services-related data were stored in the customized relational GPS 4 Success database at Appalachian State University in the College Access Partnerships division.

Examination of Student Perceptions Research Design

The second set of analyses were utilized to answer Research Question 3. Under the assumption that text exploration has the capacity to tell researchers about the psychology of individual participants, as well as the subject matters about which they think (Pennebaker, Boyd, Jordan, & Blackburn, 2015), a survey was designed, based on the conditions of Tinto's (2012a) framework (see Appendix B). Respondents were asked to: 1) describe family views on education; 2) self-report educational obstacles experienced and supports which have helped them overcome those obstacles; and 3) describe any personal involvement at ICC and in the surrounding community. Two text-based statistical analytics packages, Linguistic Inquiry and Word Count (LIWC) and SAS text miner, were employed to construct and interpret meaning from the responses. These analyses added qualitative insight, and thus, a more robust interpretation of the intervention's influence.

Assumptions of text analytics.

Text analytics utilizes computer-generated quantitative statistics to conduct research on qualitative data (Pennebaker, 2011; Tausczik & Pennebaker, 2010; SAS, 2016). One assumption of text analytics is that researchers must account for the likely existence of latency—the delayed development of new ways of thinking about the world. A researcher utilizing text analytics must recognize that a student who participated in an

intervention may be thinking differently about the world even though his/her writing may not immediately reflect that fact, because it takes time for one's thoughts to catch up to new modes of thinking. A second assumption is that text is a reflective indicator of the mind (Pennebaker, 2011; Tausczik & Pennebaker, 2010). Whereas the impact evaluation analyses were applied to explain causation, the examination of student perceptions were exploratory and intended to provide a descriptive and reflective measure of participants' psychology and the subject matters about which they thought.

Linguistic inquiry and word count (LIWC).

LIWC, is a program which characterizes text samples by determining individual personality and cognitive ability characteristics of a document. LIWC uses pre-defined dictionaries to generate quantitative statistics, based on proportions of words in a sample's linguistic categories (e.g., pronouns, positive emotion words) (Tausczik & Pennebaker, 2010). It has been validated with respect to its ability to link word usage to behaviors, thoughts, and psychological states in a range of experimental settings (Pennebaker et al., 2015; Tausczik & Pennebaker, 2010).

The LIWC inquiry focused on four key psychological variables to discover patterns of thought. These variables—analytic thinking, clout, authentic thinking, and emotional tone—each represent an aggregate of a number of other LIWC variables. An analytic thinking score reflects the

level of formal and logical thinking of a participant, a clout score reflects the level of confidence and expertise, an authentic score reflects the level of honesty and willingness to disclose personal truths, and an emotional tone score reflects the level that an author is either positive and upbeat, or anxious, sad, and/or hostile (Pennebaker, 2011).

A series of *t* tests were conducted on the scores of the four key LIWC variables to compare the means of those intervention respondents who persisted to those who did not. The *t* tests were used to interpret and compare the linguistic and psychological processes of the groups.

SAS text miner.

Whereas LIWC provided output on the text responses of individual participants, SAS text miner was used for topic and theme extraction to describe the underlying structure and key subject matter about which students wrote. For these analyses, I sought to discover patterns in the text through computer-generated themes which emerged, based upon how frequently certain key words/topics appeared.

After spell-checking responses, frequency counts were conducted to determine which noun(s), adjective(s), and verb(s) were used most often. Next, a search of words directly surrounding those high-frequency words led to a deeper understanding of how students used them in context. Concept-linking, which uses statistical backing to link key concepts to other terms (visualize a web of words with a major theme in the center),

was then utilized to better understand how words were interconnected, in order to determine similarities and differences in the ways intervention participants who persisted thought about concepts tied to Tinto's (2012a) framework, as compared to those who did not persist. This methodology was utilized for each of the three individual open-ended questions linked to Tinto's (2012a) conditions.

Though SAS text miner does provide quantitative statistics for guidance, I ultimately drew on interpretivism to make sense of the quantitative output. Interpretivists believe that reality is dynamic, complex, and socially constructed, and that narratives offer truths about the world in which people live (Crotty, 1998; Gall, Gall, & Borg, 2005; Suter, 2012). The exploratory subjective examination of student perceptions, therefore, was taken both to uncover connections between the language that participants used and their potential values and lived realities, and to understand and describe the human nature and human experiences of the participants. In some cases, this required re-visiting parts of text in order to take a closer look at language use in context.

Data collection and participants.

In April 2017, the GPS 4 Success services coordinator randomly selected 20 students from the intervention group to request their participation in filling out the student perceptions survey. This part of the school year was chosen because intervention students had received almost

the entire intervention by the time that they were asked to respond. The services coordinator attempted to contact these students via e-mail, text-messaging, and in-person. The McNair Educational Foundation offered $25 gift-cards to willing participants. Of those selected students, ten intervention students participated by filling out the survey found in Appendix B. Responses were given electronically, in a monitored ICC on-campus computer lab, and were housed virtually in a protected folder managed by the McNair Educational Foundation before being de-identified, matched to individual students, and provided for analyses.

Due to the small sample size of text collected, the examination of student perceptions should be recognized as an exploratory, student-centered pilot investigation with the potential to guide future research.

Validity

Validity, the extent to which both the analyses of postsecondary support services and the examination of student perceptions outlined actually measured what they were intended to measure (Suter, 2012), was an important consideration. The two main threats to the validity of this study were both a result of the small group sizes utilized in analyses.

The first threat to validity was the fact that group sizes had the capacity to hinder the generalizability of the study's results, and thus, the measurement of the true effect of the intervention services. With respect to Research Question 1, the analyses of persistence patterns between

intervention and control group, the sizes of the intervention group ($N = 33$) and the control group ($N = 47$) were quite different. These analyses would have benefitted from more balanced group sizes, in addition to larger groups. With respect to Research Question 2, the analyses of persistence patterns among groups of intervention students, the relatively small group of ICC intervention students ($N = 33$) limited the number of variables by which the data could be disaggregated and analyzed. Depending on the variable that was used to split the intervention group for analyses, group sizes sometimes differed greatly (e.g., as many as 27 students in one group and as few as 6 students in the other). Finally, with respect to Research Question 3, the exploratory analyses of text, the group size of just ten students for analyses mandated that the text analyses could only be purely exploratory, and thus not generalizable.

The second threat to the validity of the study was a lack of statistical power. Power is the likelihood of finding an effect, if there is one, in the group being studied (Suter, 2012), and it is affected by group size. If the group sizes analyzed had been larger, the power would have increased, and my ability to detect and measure the true effect of both services and other independent variables would have increased, as well.

Confidentiality Protections

Institutional Review Board (IRB) approval was obtained through Appalachian State University to conduct the analyses using extant data

(see Appendix J). A unique identification number was assigned to each student for all unit-record data. All personally-identifiable information (PII) was removed, and unique identifiers were used to link data instead.

Summary

This chapter has described the two-part methodology through which the research questions were analyzed. The impact evaluation of postsecondary support services utilized logistic regression to analyze quantitative services-based data in order to determine whether postsecondary persistence patterns differed between intervention and control group (Research Questions 1) and whether persistence patterns differed based on various groupings within the intervention group (Research Question 2). The examination of student perceptions utilized text analytics to explore whether descriptive patterns in written student responses based on Tinto's framework differed between intervention students who persisted and those who did not. This combination of both quantitative and qualitative analyses was implemented in an effort to provide a robust, well-rounded examination of the overall impact of the GPS 4 Success intervention. Results are presented in Chapter 4.

Chapter 4: Results

The purpose of this study was to evaluate the impact of the persistence-focused, student-centered GPS 4 Success intervention on a randomly-selected group of non-ROPE ICC first-time college freshmen.

Research Questions

The following research questions guided the study:

Research Question 1: Do postsecondary persistence patterns differ significantly among non-ROPE ICC students who received the GPS 4 Success intervention and those who did not?

Research Question 2: Within the intervention group, do postsecondary persistence patterns differ significantly among non-ROPE ICC students, based on various groupings (e.g., number and type of services received, degree association, semester-by-semester enrollment status, cumulative high school GPA, gender, race)?

Research Question 3: How do descriptive patterns in written student responses based on Tinto's framework differ between intervention students who persisted and those who did not?

Profile of Students and Baseline Equivalence of Groups

A total of 174 non-ROPE Rutherford County high school graduates were randomly assigned to either an intervention group ($N = 87$) or a control group ($N = 87$) at the study's inception. Table 1 presents the enrollment status of those participants, broken down by group.

Table 1

Enrollment Status 2016-17 of Study Participants

Enrollment Status 2016-17	*N*	Percent of Group
Intervention Group	87	100.0
Enrolled at ICC	34	39.1
Enrolled Elsewhere	14	16.1
Delayed Enrollment (fall 2017)	4	4.6
Did Not Enroll	29	33.3
Dropped out of Study	6	6.9
Control Group	87	100.0
Enrolled at ICC	49	56.3
Enrolled Elsewhere	14	16.1
Delayed Enrollment (fall 2017)	2	2.3
Did Not Enroll	22	25.3
Dropped out of Study	0	0.0

Treatment on the treated (TOT) analyses were conducted to assess the impact evaluation of services. For these analyses, only those intervention group students who actually received the intervention and

only those control group students who did not were analyzed. Three of the 83 students who enrolled at ICC in 2016-17 were dropped before analyses began. Those dropped included: two crossovers—students from the control group who received at least one service; and one intervention group student who did not receive any services. Accounting for these adjustments, the TOT intervention group consisted of 33 ICC students, while the corresponding control group consisted of 47 students. It was these students who composed the groups used for the analyses.

A test for baseline equivalence of groups was conducted using the cumulative high school GPA variable. An independent samples *t* test compared mean GPA of the intervention group to that of the control group. There was no significant difference in mean GPA between intervention group ($M = 2.97, SD = 0.65$) and control group ($M = 3.01, SD = 0.66$); $t(78) = .259, p = .80$ (two-tailed). The magnitude of differences in means ($\text{mean difference} = .04, 95\%\ \text{CI}: -.26 \text{ to } .34$) was very small ($\text{eta squared} = .0009$), indicating equivalence of groups. Tables 2 and 3 outline the gender and ethnicity of the 80 participants, respectively.

Table 2

Gender of Study Participants

Gender	*N*	Percent
Female	39	48.8
Male	41	51.3
Total	80	100.0

Table 3

Ethnicity of Study Participants

Ethnicity	*N*	Percent
African-American	15	18.8
American Indian	0	0.0
Asian	0	0.0
Caucasian	51	63.8
Hispanic	6	7.5
Multi-racial	8	10.0
Total	80	100.0

Exploratory Data Analyses

A number of steps were taken in an effort to explore the effect of GPS 4 Success service dosages on persistence. First, the persistence rates of participants were explored to compare between intervention and control group. As outlined in Table 4, 45.5% of intervention participants returned for a sophomore year. It is worth noting that this percentage slightly exceeded that of the control group (44.7%), though the difference does not imply statistical significance.

Table 4

Persistence in Relation to Intervention Category

Category	*N*	Percent
Intervention	33	100.0
Persisted	15	45.5
Did Not Persist	18	54.5
Control	47	100.0
Persisted	21	44.7
Did Not Persist	26	55.3

Next, the original data set, which contained information on every service provided throughout the 2016-17 school year, including the Tinto (2012a) condition to which that service pertained and the student who

received that service, was collapsed to the individual student-level. This placed each student's data into an individual row, allowing me to explore on a student-by-student basis.

After collapsing, a number of new variables were computed. This step allowed me to conduct more well-rounded analyses by clearly revealing otherwise unknown distinctions in the type, number, and percent of services provided to each individual student. For example, if two different intervention students each received three individual counseling services, but one of the students received ten services overall and the other received 20 overall, then the students would have received different percentages of individual counseling, with respect to the overall percent of services received. In this example, 30% of the services received by the first student would have been represented by individual counseling, whereas 15% of the services received by the second student would have been individual counseling. In an effort to explore whether these types of relationships had a significant effect on persistence, I created additional variables. In all, 87 variables were utilized—58 of which were computed. A full list of variables, along with a data dictionary explaining each, is located in Appendix C.

After collapsing the data set and computing additional variables, service dosages were explored. As depicted in Table 5, the bulk (89.5%)

of the services provided fell under the support condition, with most being individual or group text communication.

Table 5

Services Provided by Type/Condition

Condition	*N*	Percent
Assessment/Feedback		
2/4-Year Plan	47	7.1
Expectations		
GPS Contract	22	3.3
Support		
Course Registration Aid	25	3.8
Financial Aid Counsel	18	2.7
Individual Counseling	55	8.4
Individual Text Message	299	45.4
Mass Text Message	192	29.2
Total	658	100.0

In all, 658 services were provided to the 33 intervention students who attended ICC. The number of services provided to an individual student ranged from 6 to 86 ($M = 19.94, SD = 16.99$).

The next exploration separated services both by duration and by condition. With respect to duration, a value of 0.1 hours was used as a cutoff. This cutoff allowed for differentiation between those services

which were shorter in duration (less than or equal to 0.1 hours) and those that were longer, more involved, and more likely to include face-to-face interaction (greater than 0.1 hours). Of the 658 services provided, 431 (65.5%) were longer than 0.1 hours.

With respect to Tinto's (2012a) service conditions, Tables 6 and 7 outline the means and 95% confidence intervals of number of services per intervention student and percent of dosage per intervention student for those students who persisted and those who did not. Recall that the involvement (engagement) condition was dropped by the services coordinator from the intervention. In each instance outlined in the two tables, the confidence intervals for students who persisted overlapped with those of the students who did not. This indicates that, with respect to these variables, the differences between the two groups were not statistically significant.

Table 6

Number of Services per Intervention Student in Relation to Postsecondary Persistence

	Students Who Persisted				Students Who Did Not Persist			
Number of Services	*M*	*SD*	Lower CI	Upper CI	*M*	*SD*	Lower CI	Upper CI
Assessment/Feedback	1.33	0.98	0.79	1.87	1.50	0.92	1.04	1.96
Expectations	0.60	0.51	0.32	0.88	0.72	0.46	0.49	0.95
Support	21.00	22.33	8.64	33.37	15.22	9.16	10.67	19.78
Total Services	22.93	22.86	10.27	35.59	17.44	9.94	12.50	22.39
Above 0.1 Hour	16.07	21.86	3.96	21.17	10.56	9.14	6.01	15.10

Table 7

Percent of Services per Intervention Student in Relation to Postsecondary Persistence

	Students Who Persisted				Students Who Did Not Persist			
Percent of Services	*M*	*SD*	Lower CI	Upper CI	*M*	*SD*	Lower CI	Upper CI
Assessment/Feedback	8.28	7.79	3.97	12.60	9.33	5.60	6.55	12.12
Expectations	3.18	3.88	1.03	5.33	4.26	3.62	2.46	6.06
Support	88.53	10.11	82.93	94.13	86.41	6.94	82.96	86.49
Above 0.1 Hour	45.34	34.10	26.46	64.22	48.71	25.07	36.25	61.18

Analyses of Persistence Through Impact Evaluation of Services

As described in Chapter 1, Research Questions 1 and 2 were utilized to evaluate the impact of the services provided through the GPS 4 Success study. The impact evaluation was conducted using SPSS to run a number of logistic regressions. Year-two persistence patterns were first analyzed by comparing the persistence rates of the intervention group to those of the control group in an effort to see if the intervention had an effect on freshmen-to-sophomore persistence (Research Question 1). Rates were then compared exclusively among intervention participants to determine whether any predictor variables had a significant effect on persistence, based on various groupings (Research Question 2).

Analyses of Research Question 1

The first logistic regression analyzed whether postsecondary persistence patterns differed significantly among GPS 4 Success participants, based on whether they received the intervention. This step was taken to answer Research Question 1: Do postsecondary persistence patterns differ significantly among non-ROPE ICC students who received the GPS 4 Success intervention and those who did not?

Before analyses began, the original data set was reduced so that only those students who enrolled at ICC in either fall 2016 or spring 2017 were represented ($N = 80$). ICC participants were compared according to whether they were in the intervention group ($N = 33$) or the control group

($N = 47$). The dependent variable was freshmen-to-sophomore student persistence (persisted). As shown in Table 8, the intervention did not have a significant impact on persistence.

Table 8

Logistic Regression Analysis of Intervention

Predictor	*B*	*SE*	*Wald*	*Exp(B)*	*p*	95% CI for *Exp(B)*	
						Lower	Upper
Intervention Category	.031	.456	.005	1.032	.945	.422	2.524
Constant	-.214	.293	.530	.808	.467		

Note. Dependent Variable was Persisted/Did Not Persist.

Analyses of Research Question 2

The next set of logistic regressions analyzed whether postsecondary persistence patterns differed significantly among only intervention participants when grouped based on an assortment of variables. They were utilized to answer Research Question 2: Within the intervention group, do postsecondary persistence patterns differ significantly among non-ROPE ICC students, based on various groupings (e.g., number and type of services received, degree association, semester-by-semester enrollment status, cumulative high school GPA, gender)?

Before analyses began, the data set of 80 ICC students used to answer Research Question 1 was reduced to the aforementioned TOT intervention group ($N = 33$). A correlation matrix was created and used for variable reduction (see Appendix D). Variables were dropped from analyses based on a Pearson's correlation coefficient cutoff of 0.9 to reduce multicollinearity and to increase the accuracy, interpretability, and robustness of the models (Tabachnick & Fidell, 2013).

Investigation of services and other independent variables.

For the first model, persistence patterns were analyzed among intervention students to determine whether any of Tinto's (2012a) individual service conditions, in addition to various binary independent variables had a significant impact on persistence. Based on logistic regression, the only independent variables selected as predictors for the

model were: 1) whether the student dropped in enrollment status from fall 2016 to spring 2017 (e.g., a drop from full-time to three-quarters time, a drop from three-quarters-time to half-time, a drop from full-time to less than half-time); and 2) whether the student was pursuing an associate's degree. Notably, the two predictors were both based on individual student decisions. The Chi-square value, $c^2\ (5, N = 33) = 14.774, p = .011$, indicates that the model was able to distinguish between students who persisted and those who did not. As a whole, the model explained between 36.1% (Cox and Snell R square) and 48.3% (Nagelkerke R square) of variance in persistence, correctly classifying 78.8% of cases.

As shown in Table 9, the strongest predictor was whether a student dropped in enrollment status (e.g., dropped from full-time to three-quarter-time, dropped from three-quarter-time to half-time) from fall 2016 to spring 2017—recording an odds ratio of .031. This indicates that an intervention student whose enrollment status decreased between fall 2016 and spring 2017 was about one in thirty two times as likely to return in fall 2017, controlling for all other factors. The second-strongest predictor was whether a student was pursuing an associate's degree. The odds ratio of 7.869 for students seeking an associate's degree indicates that those students who declared an associate's were nearly eight times as likely to persist to their sophomore year as those who either did not declare or were pursuing another title (e.g., a certificate), controlling for all other factors.

Table 9

Logistic Regression Analysis of Service Condition and Student-Level Decision Variables

Predictor	*B*	*SE*	*Wald*	*Exp(B)*	*p*	95% CI for *Exp(B)*	
						Lower	Upper
Number Expectations	-.835	1.201	.483	.434	.487	.041	4.569
Number Support	.049	.044	1.207	1.050	.272	.963	1.145
Number Assessment & Feedback	.205	.645	.101	1.228	.750	.347	4.343
Drop in Enrollment Status	-3.471	1.446	5.765	.031	.016*	.002	.529
Seeking Associate's	2.063	1.021	4.086	7.869	.043*	1.065	58.159
Constant	-.953	.988	.931	.386	.335		

Note. Dependent Variable was Persisted/Did Not Persist.

* $p < .05$.

Grouping by whether student corresponded via text message.

To further explore Research Question 2, intervention students were grouped by whether or not they communicated with the GPS 4 Success services coordinator during the 2016-17 school year via individual text message ($N = 22$) or not ($N = 11$). The dependent variable was freshmen-to-sophomore persistence. Based on forward logistic regression, the independent variables selected as predictors for the model were: 1) whether the student dropped in enrollment status from fall 2016 to spring 2017; and 2) gender.

The model was statistically significant for students who communicated via individual text message, $c^2\ (2, N = 33) = 12.304, p = .002$. This indicates that the model was able to distinguish between those students who communicated via individual text and persisted to a sophomore year and those who communicated via individual text and did not persist. The model as a whole explained between 42.8% (Cox and Snell R square) and 57.8% (Nagelkerke R square) of the variance in persistence for students who communicated via individual text message, and it correctly classified 86.4% of these students. Based on forward logistic regression, none of the service variables (Tinto's conditions) were selected for the model.

As shown in Table 10, both of the independent variables made a unique statistically significant contribution to the model. The strongest

predictor of persistence was whether a student dropped in enrollment status from fall 2016 to spring 2017, recording an odds ratio of .02. This indicates that a student who communicated via individual text and whose enrollment status decreased between the fall 2016 and spring 2017 semesters was about one fiftieth as likely to return to school in the fall of 2017, controlling for all other factors in the model. Additionally, the odds ratio of .029 for gender indicates that males who communicated via individual text were about one thirty fourth as likely to persist as females who did so, controlling for all other factors in the model.

Table 10

Logistic Regression Analysis by Whether Intervention Student Communicated via Individual Text Message

Predictor	*B*	*SE*	*Wald*	*Exp(B)*	*p*	95% CI for *Exp(B)*	
						Lower	Upper
Drop in Enrollment Status	-3.892	1.512	6.626	.020	.010*	.001	.395
Gender	-3.555	1.531	5.395	.029	.020*	.001	.574
Constant	1.946	1.069	3.313	7.000	.069		

Note. Dependent Variable was Persisted/Did Not Persist.

* $p < .05$.

Grouping by whether student attended full-time fall 2016.

For the final model, intervention students were grouped by whether they attended full-time during the fall 2016 semester ($N = 21$) or not ($N = 12$). The dependent variable was freshmen-to-sophomore persistence. Based on forward logistic regression, the independent variable selected as a predictor to put into the model was whether the student dropped in enrollment status from fall 2016 to spring 2017.

The stepwise model was statistically significant for students who attended full-time during the fall 2016 semester, $c^2\ (1, N = 33) = 6.988, p = .008$, indicating that it was able to distinguish between students who attended full-time during fall 2016 and persisted to a sophomore year and those who attended full-time fall 2016 and did not persist. As a whole, the model explained between 28.3% (Cox and Snell R square) and 37.8% (Nagelkerke R square) of the variance in persistence, and it correctly classified 76.2% of students. Based on forward logistic regression, none of the service variables were selected for the model.

As shown in Table 11, the variable which represented a decrease in enrollment status from fall 2016 to spring 2017 was the only one which made a significant contribution—recording an odds ratio of .063. This indicates that a student who attended full-time fall 2016 and whose enrollment status decreased spring 2017 was about one sixteenth as likely to return fall of 2017 as one whose enrollment status did not decrease.

Table 11

Logistic Regression Analysis by Whether Intervention Student Attended Full-Time Fall 2016

Predictor	*B*	*SE*	*Wald*	*Exp(B)*	*p*	95% CI for *Exp(B)*	
						Lower	Upper
Drop in Enrollment Status	-2.757	1.226	5.053	.063	.025*	.006	.702
Constant	.811	.601	1.821	2.250	.177		

Note. Dependent Variable was Persisted/Did Not Persist.

* $p < .05$.

Analyses of Persistence Through Examination of Student Perceptions

As described in Chapter 1, the examination of student perceptions was designed to answer Research Question 3: How do descriptive patterns in written student responses based on Tinto's framework differ between intervention students who persisted and those who did not? It was conducted through the lens of persistence. Twenty intervention students were randomly selected and asked to participate in the student perceptions survey. Of those twenty students, ten voluntarily completed the survey. Due to the small sample size, the examination of student perceptions analyses should be recognized as purely exploratory. However, it is my opinion that the survey results did provide valuable additional information, adding to my own understanding of the overall effect and potential of the GPS 4 Success intervention.

Profile of Survey Respondents

Table 12 provides a profile of the survey respondents in relation to gender, ethnicity, persistence status, and weekly work status.

Table 12

Profile of Survey Participants

Variable	*N*	Percent
Gender		
Female	7	70.0
Male	3	30.0
Ethnicity		
African-American	0	0.0
American Indian	0	0.0
Asian	0	0.0
Caucasian	8	80.0
Hispanic	0	0.0
Multi-racial	2	20.0
Persistence Status		
Persisted	4	40.0
Did Not Persist	6	60.0
Weekly Work Status		
At Least 20 Hours	6	60.0
Less Than 20 Hours	3	30.0
Did Not Work	1	10.0

Analyses of Research Question 3

As mentioned previously, two computer programs, LIWC and SAS text miner, were used to perform the analyses of Research Question 3. LIWC was selected for its ability to explore and characterize different personality and cognitive characteristics of individual participant responses (Pennebaker, 2011), based on the four aggregate variables described in Chapter 3: 1) analytic thinking; 2) clout; 3) authentic thinking; and 4) emotional tone. SAS text miner, on the other hand, was used for topic and theme extraction, in an effort to describe the underlying structure and key subject matter about which students wrote.

LIWC results.

A series of independent sample *t* tests were conducted on a group of intervention students to compare the mean scores of those survey respondents who persisted to a sophomore year to the mean scores of those who did not persist. As described in Chapter 3, the open-ended survey questions were purposely designed to be directly linked to three of Tinto's conditions—expectations, support, and involvement (engagement). Tests were conducted on all four of the aforementioned aggregate LIWC scores—analytic thinking, authentic thinking, clout, and emotional tone—for each of the three survey questions. A total of twelve *t* tests were conducted in all.

The LIWC scores of those who persisted were significantly different from those who did not persist on two of the twelve pairs of scores. The first significant difference in means was found between the analytic scores of the groups on the question regarding the challenges that students faced and the supports that they received. The group that persisted ($M = 65.71, SD = 9.35$) had greater scores than the group that did not ($M = 30.95, SD = 22.53$); $t(7.124) = -3.368, p = .012$ (two-tailed). The magnitude of differences in means (mean difference $= -34.76$, 95% CI: -59.07 to -10.44) was large (eta squared $= .614$), indicating a substantial difference between groups.

The second statistically significant difference in means occurred on the question regarding involvement on campus and in the local community. Once again, the analytic scores of the group that returned ($M = 92.47, SD = 9.04$) were found to be significantly different from the group that did not ($M = 33.26, SD = 29.15$); $t(6.326) = -4.650, p = .003$ (two-tailed). The magnitude of the differences in means (mean difference $= -59.20$, 95% CI: -89.97 to -28.44) was again large (eta squared $= .774$), indicating that the difference between groups was substantial. No other significant differences in means were found.

SAS text miner results.

Throughout the text mining analyses, I utilized concept link diagrams (a diagram which reveals patterns in the ways that a key word is

linked to other words among a set of text documents) and text filtering to extract common themes among responses. Sample visuals of both a concept link diagram and a text filter used to for this portion of the analyses are located in Appendix E. Additionally, synonym lists were produced. In one example, I directed SAS text miner to consider the term *college education* as a parent term and to recognize the terms college degree, and college as having the same meaning. College education was linked through a web of words to terms such as family, class, and challenge, among others. This web helped me to better understand which other terms students wrote about when reflecting on education.

Three relevant themes emerged through the analyses of text responses. As shown in Table 13, two of these themes suggested a possible pattern with respect to whether a student persisted or not. Both of them were nearly mutually exclusive. The third theme was found to be common among both those who persisted and those who did not.

The first theme was labeled *types of challenges faced*. It emerged largely in the analyses of the second survey question, which asked about the challenges faced during a student's first year and any corresponding supports which helped him/her overcome those challenges. For those who persisted, the topic of their writing was school-related work. These students recognized their own greatest challenges as coursework requirements, and they wrote about topics such as exams, the demands of

keeping up with classes, and needing help from professors to succeed. Students who did not return, on the other hand, wrote largely of exterior challenges outside the realm of school (e.g., a critically-ill family member, a demanding job, a lack of engagement with college peers). Whereas those who persisted recognized their challenges as being related to the college-level work that they needed to complete to continue their college education, those who did not return recognized their challenges as coming from outside of the college experience.

The second theme which emerged was labeled *campus involvement*. It arose in the analyses of the third survey question, which asked students to describe how they were involved on campus and/or within the local community during their first year of college. Only three of the ten students mentioned being regularly involved in a club or activity on the ICC campus (e.g., sports day, Acts club, work with a professor). All three of those students persisted. Of the students who failed to persist, however, none reported being involved on campus.

Table 13

Persistence-Based Themes Found to be Different Between Students Who Persisted/Did Not Persist

Theme	Persist Category	Persist Category	No-Persist Category	No-Persist Category
	N	Percent	*N*	Percent
Types of Challenges Faced				
School-Related	4	100.0	1	16.7
Not School-Related	0	0.0	5	83.3
Involvement				
On-Campus	3	75.0	0	0.0
Community	0	0.0	1	16.7
No Involvement	1	25.0	5	83.3

The final theme, common among both returners and non-returners, was labeled *value of education*. Specifically, students noted that their families had shown a great deal of support, and that family views on college had impacted the students' decisions to attend a postsecondary institution. Additionally, students wrote that they and their families believed that a college education would lead to opportunities for a better life. This can be seen in Appendix E—a screenshot of the text filter tool which was used throughout the text analyses in order to filter text by specific terms and to see the context and unique documents that contained those terms. In all cases, students wrote that their families were encouraging, often imploring them to complete, and thus surpass the generations of their families that came before them. College education was always linked to positive words with respect to jobs and other future prospects.

Summary of Results

Though neither the intervention nor the individual services based on Tinto's (2012a) conditions were found to have an impact on postsecondary persistence patterns (Research Question 1), the results of Research Question 2 indicate that some factors did impact the likelihood that an intervention participant would persist to a second year of postsecondary education at ICC. This was true not only when accounting for all intervention students, but also when the analyses were narrowed,

splitting among intervention students by certain variables. Specific themes also emerged as predictors of persistence with respect to the text responses provided by intervention students (Research Question 3), though the results of those text responses should be recognized as strictly exploratory.

With respect to Research Question 2, in an analysis of all intervention participants, a statistically significant model was able to distinguish between those who persisted and those who did not, based on two binary grouping variables which made a statistically significant contribution: 1) whether or not a student's enrollment status dropped between the fall 2016 and spring 2017 semester (e.g., dropped from full-time to three-quarter-time, dropped from three-quarter-time to half-time); and 2) whether the student was seeking an associate's degree. Additionally, when intervention students were split into groups for analyses based on an assortment of variables, two notable statistically significant models emerged. The first, based on whether a student corresponded at some point with the services coordinator via individual text message, had two variables which made statistically significant contributions: 1) whether the student dropped in enrollment status; and 2) gender. The second prominent model compared groups based on whether a student attended full-time during the fall 2016 semester. The only significant contributor to this model was whether there was a drop in enrollment status.

In each of the aforementioned instances, neither the service-based variables (e.g., number of support services, percent of services above 0.1 hour cutoff) nor the attributes of students which were provided in the original data set (e.g., cumulative high school GPA, ethnicity, high school) were found to be significant predictors of persistence between the intervention and control group or among sub-groups within the intervention group. Instead, with only one exception (gender in the model based on individual text message correspondence), it was largely the individual postsecondary commitment-based decisions that the students themselves made which turned out to be predictive of persistence (e.g., was there a drop in enrollment status from first to second semester, was the student pursuing an associate's degree).

With respect to the exploratory examination of student perceptions, statistically significant differences were found in the thinking styles of those intervention students who returned as compared to those who did not in two LIWC categories: 1) analytic thinking on challenges/support; and 2) analytic thinking on involvement. In both of these instances, the level of analytic thinking was substantially larger for those who returned than those who did not. This indicated that those who persisted thought more formally, logically, and hierarchically about these two topics, whereas those who did not persist thought more informally and personally (Pennebaker et al., 2015).

Interestingly, results of the SAS text miner exploration also suggest that there were differences in the ways students wrote about challenges/support and involvement. While the LIWC analyses provided inferences about the psychology behind student responses, the SAS analyses offered details on the themes about which students wrote in these two areas. Students who persisted to a second year were students who saw their major challenges as stemming from their college-level coursework. They were also students who were involved in something outside of normal schoolwork on the ICC campus. Those who did not persist, on the other hand, wrote of exterior challenges, such as the need to hold a job. Additionally, they were not involved on the ICC campus in any way. Though exploratory, one could argue that these results indicate one of the same key ideas as Tinto's (1975, 1987, 1993) interactionalist theory of student departure—that the more involved a student is on campus, the more engaged s/he becomes, and therefore the more likely s/he is to buy into his/her education and persist. They also endorse Tinto's (2012a) suggestion that an institution should promote the involvement (engagement) condition on campus through its programs and policies in an effort to help students persist.

Chapter 5: Discussion and Recommendations

This study evaluated whether the GPS 4 Success intervention impacted the persistence of its first cohort of students, a group of first-time college freshmen, during the 2016-17 school year at ICC. It has added to the body of knowledge on postsecondary retention and persistence in some valuable ways.

First, Tinto's (2012a) framework, which suggests that postsecondary students are most likely to persist when institutional leadership focuses programs, services, and policy on expectations, assessment and feedback, support, and involvement (engagement), was tested. This was accomplished through the analyses of Research Questions 1 and 2, which asked whether the intervention services had an effect on persistence patterns, both when comparing between the intervention and control groups and when the intervention group was split based on an assortment of variables. The study did not actually find any of the conditions, themselves, to be significant predictors of persistence (though again, the involvement condition was not implemented). However, some other variables which were based on individual student decisions were found to be significant predictors of persistence (e.g., a student who dropped from full-time to three-quarters time was less likely to persist). An important implication of this finding is that the services provided could be used to help shape those individual decisions that students make in

ways that this study found will promote persistence. In other words, the services coordinator might use summer orientation, individual counseling sessions, and other intervention services to suggest to students the importance of not taking a lighter course load during the spring semester or the value in finding and pursuing a meaningful associate's degree as quickly as possible upon enrollment.

Second, the GPS 4 Success study has provided an example of the institution-specific research around retention and persistence that is called for in the literature (Braxton et al., 2014; Tinto, 2012a). As mentioned previously, though neither the attributes of students provided by the data set (e.g., cumulative high school GPA) nor the service-based variables (e.g., number/percent of assessment and feedback, expectations, and support services provided to an individual student) were found to be significant predictors of persistence, there was a subset of variables based on those individual decisions that students made which were predictive. While it is certainly true that the services coordinator could use this information to better serve students by helping them persist, ICC leadership also has an opportunity to use this knowledge in an effort to improve retention, and thus, potentially experience some of the many benefits of improved retention discussed in the literature review of this document (e.g., financial health, simplified resource allocation, strong institutional reputation). Additionally, the results of Research Question 3,

the exploratory analyses of text, offered potential insights in written responses which might predict a student's return. These results have the potential to inform retention-based decisions for a school which commits to analyzing text.

Finally, some aspects of the analyses confirmed the challenges outlined in the literature with respect to operationalizing and measuring retention and persistence, particularly at the community college level. For example, a student who waits until the spring semester of a given year to begin his/her postsecondary career and returns the following fall is not considered as being retained under the federal definition of retention (National Center for Education Statistics, 2017). The same goes for a student who successfully transfers to a school other than his/her original institution after one year. This study, however, did count these students as having persisted. As explained previously, persistence and retention are not the same. Given that this was a persistence-focused study, it was important that if a student continued to progress through higher education, s/he be counted as having persisted. These challenges, present in this study, demonstrate the difficulty in defining and operationalizing retention and persistence in higher education, particularly at community colleges.

Lessons Learned and Potential Implications of Results

This educational inquiry arose out of my desire to see the development of targeted services which help students, specifically

community college students, persist in their postsecondary educational endeavors. For me, the GPS 4 Success study was a personal endeavor. It represented an opportunity to make an impact on social justice, as even a small addition to the body of knowledge on community college retention and persistence has the potential to positively influence students from populations which are traditionally underrepresented in higher education. In this case, I recognized this study as a chance to help students persist at the 2-year level and, in doing so, help prepare them to persist toward and complete a 4-year degree, if they so desire. Though there was not sufficient evidence to suggest that the GPS 4 Success intervention had an impact on persistence, it is important to recognize that a number of lessons were still learned through this work.

One of the most valuable personal takeaways from this experience was the knowledge I gained about how the framework around which this study was designed can be used as a tool to influence retention and persistence. The four-condition framework is one general enough that it can be creatively molded to fit any institution type and size. It is relevant in the classroom, across campus, and within institutional policy. Through my lens as a current instructor of college mathematics, and as an aspiring leader in higher education, this was an important lesson. With some imagination, Tinto's (2012a) framework can be molded to fit at both the

community college and the four-year level, and at both residential and commuter schools.

Yet, while learning to consider how retention and persistence can be promoted through the lens of Tinto's framework was certainly valuable, I now recognize that learning experience as just a starting point. As I continue to develop as a classroom instructor, it will be important to personalize this framework, adding situation-specific pieces over time. Student needs and instructional pedagogies will no doubt continue to change (e.g., online learning will likely grow in prominence), and this will need to be taken into account while considering how retention and persistence can be promoted in the classroom. Adjustments and additions will no doubt be influenced by additional variables like student demographics, as well as changing approaches to education (e.g., a potential change in the way institutions offer developmental education).

Through the lens of an aspiring administrator, I also now recognize that, in order to support students, teachers, and other campus stakeholders, there will be a need to carefully analyze how the four conditions play roles in the classroom, in policy, and even in athletics, clubs, and campus organizations. If the opportunity arises to one day analyze and write policy, it will be important to consider how this framework might be put into practice through those actions. For example, I am now keenly aware of the importance and potential of bringing sometimes seemingly

unrelated stakeholders (e.g., campus administrators and instructors, athletic teams, clubs and other organizations, community groups, small businesses, K-12 employees) together to bring this framework to life in order to put students and institutions at an advantage with respect to retention and persistence.

While the investigation of postsecondary retention and persistence through a meaningful framework was certainly a valuable learning experience, the actual results of the GPS 4 Success study also provided an opportunity to consider important takeaways from this work. The fact that student-level decisions (e.g., whether a student dropped in enrollment status after his/her first semester, whether a student was pursuing an associate's degree) were the greatest predictors of persistence reminded me that humanity and student-centeredness demand attention when analyzing and attempting to shape retention and persistence on a college campus. Though the analyses were largely quantitative, the reality is that each student analyzed is an individual who daily faces his/her own unique barriers to persistence. The community college students who participated in this study, for example, live busy, challenging lives which may keep them from making their schoolwork and engagement on campus as their main focus. As evidenced by the survey responses and various conversations with the intervention services coordinator, many of the participants in this study work full-time or close, and they tend to have a

number of time-consuming responsibilities outside of school. These restrictions made it less likely that any particular student would persist.

The implication of this lesson is that instructors and leaders in higher education must continue to develop and seek out unique ways which encourage decisions found to promote persistence, while supporting and engaging students on a personal level. As a current college instructor, it is my opinion that in order to accomplish this, leaders should first look to the one resource which spends the most time with students and knows them best—their teachers. Engaged classrooms should be considered one of the most efficient ways to involve many students at once, and should, therefore, be a focus for community college leadership. Innovative developments shown to engage and challenge students in the classroom might be rewarded with course buy-outs and other instructor incentives which would open up time and space for instructors to pass their knowledge on to administrators and peers.

Finally, and possibly most importantly, leaders must bear in mind that there does not exist a one-size-fits-all solution to the challenge of improving postsecondary retention and persistence. Institution-specific research and a culture of evidence which produces innovative, definable courses of action will remain necessary if measured improvements in retention and persistence are to be realized, particularly at the community

college level, where traditionally underrepresented students and students from low-income backgrounds are more likely to attend.

Recommendations to Promote Retention and Persistence

The impact evaluation of services and the examination of student perceptions combined to provide a well-rounded examination of the overall effect that the GPS 4 Success intervention had on the persistence patterns of participants. The following recommendations, designed to help GPS 4 Success and ICC leadership promote postsecondary student persistence, stem from the comprehensive results of the analyses.

Recommendation 1: Monitor changes in student records after both the fall and spring semesters, using characteristics which this study found to be predictors of persistence as triggers for required individual counseling. For example, the analyses found that a drop in enrollment status was a significant predictor of freshmen-to-sophomore persistence. Therefore, consider meeting with any student whose enrollment status drops from one semester to the next in order to help navigate those challenges which might increase the likelihood of eventually dropping out.

Recommendation 2: Use individual counseling services to encourage students to attend as close to full-time as possible, to avoid dropping in enrollment status after an initial postsecondary semester (e.g., full-time to three-quarter time), and to guide students toward pursuing an associate's degree which is meaningful to them.

Recommendation 3: Implement the involvement (engagement) condition by promoting student extracurricular activity on campus (e.g., offer a specified counseling option focused on helping students become involved with a campus-based or community group, plan social events to encourage peer networking and supportive relationships).

Recommendation 4: Seek a balance in the number and percentage of each of Tinto's four conditions, given that there is no evidence that the support condition (support made up 89.5% of the services provided during the first year of the GPS 4 Success intervention) is more effective at improving retention and persistence than the expectations, assessment and feedback, or engagement conditions.

Recommendation 5: Communicate with campus instructors in an effort to integrate the intervention at the classroom level. Tinto (2012a) suggested that the most crucial platform for institutions to promote retention and persistence is within the classroom, and that instructors need tools which empower them to help with retention and persistence. Connect with on-campus instructors to make them aware that the intervention exists and that the four-condition framework which serves as its foundation provides a context for instructors and the services coordinator to collectively help students persist.

Recommendations for Future Research

While the results of this study have added to the body of knowledge on postsecondary retention and persistence, they also indicate potential extensions of the findings through future inquiry. For example, the steps taken to plan, execute, and analyze the GPS 4 Success intervention have been well-documented. Therefore, similar studies could be replicated at other institutions of the 2- and 4-year variety, in an effort to provide meaningful institution-specific data, and to offer a more complete understanding of how services based on Tinto's (2012a) conditions impact postsecondary retention.

With specific regard to GPS 4 Success, the intervention stands to benefit from future analyses with a larger sample. Most importantly, a larger sample would provide the study with additional power to detect an effect on persistence more appropriately.

Next, there is room for further examination into GPS 4 Success through a longitudinal collection of data. The first cohort of GPS 4 Success students who returned for their fall 2017 semester are currently in their second year of college. Since a low percentage of community college students complete in two years (Tinto, 2012a), it would be valuable to examine whether the patterns of persistence, completion, and successful transfer for those students who remained in the program for a second year, receiving long-term support, differ from the same 2-year patterns of

students who did not receive the intervention for two years. Analyses could be conducted in a fashion similar to those outlined in this document.

Additionally, GPS 4 Success should not discount the collection of text data such as that which was sought by the student perceptions survey. The exploratory analyses of persistence through Research Question 3 suggested that those who wrote highly analytic responses and those who were involved on campus and recognized their main challenges as stemming from schoolwork, may have been more likely to return for a second year. This warrants further exploration, also using a larger sample. Subsequent research might collect text samples near the end of the fall semester, analyze them over the winter break, and assess in the spring whether there was a difference in the fall-to-spring persistence patterns based on the aforementioned variables. Findings could further inform which variables leaders analyze in determining the students who need the most guidance and support as they progress through college.

Finally, GPS 4 Success might take a closer look at the fidelity of the intervention by carefully re-considering how each service is defined, operationalized, and fits as one of Tinto's (2012a) four conditions. It is my personal opinion that if these services are defined more clearly and if they are provided using a different balance (e.g., provide more expectations and assessment and feedback services, include the involvement condition),

then future research is likely to find that some of the services make a contribution to an intervention that impacts persistence.

Limitations

The GPS 4 Success study had several limitations worth addressing. One limitation was that of the 174 students who initially agreed to participate, only 83 enrolled at ICC and just 80 were able to be used in the TOT analyses. While many others from both the original intervention and control groups did enroll at 4-year schools and other 2-year schools, this study was designed to analyze the impact of the GPS 4 Success intervention on non-ROPE students attending ICC. As a result, the overall number of students who enrolled at ICC and were eligible for TOT analyses ($N = 80$) and the sizes of both the intervention group ($N = 33$) and the control group ($N = 47$) were smaller than anticipated.

Another limitation was that most intervention students received either a comparatively low number or none of the services linked to both the expectations and the assessment and feedback conditions, and that the involvement (engagement) condition was not implemented at all. Ideally, a better balance would have been struck between the dosage of support-based services that intervention students received and that of the services from both the expectations and assessment and feedback categories.

Third, the low response rate to the student perceptions survey ($N = 10$) requires that any interpretation of the examination of student

perceptions be considered strictly exploratory. While it is my personal opinion that, given more data, Research Question 3 represents a viable means to better understand student persistence, the small sample size was not enough to validate any of the interpretations provided in the discussion of the analyses of text.

Finally, it is worth noting that the results and conclusions of the GPS 4 Success study may not be generalizable. ICC is unique in many ways. It is a non-residential community college, and it pulls the vast majority of its students from a rural environment with a distinct population. While Tinto (2012a) certainly provides a framework for other institutions to utilize, any school attempting to replicate this study should adjust according to the unique characteristics of its own institution and the population it serves before implementing a similar intervention.

Closing Thoughts

Retention, persistence, and student success will not advance by accident. Rather, they will only improve as the result of targeted, deliberate, and well-planned actions taken by institutional leaders, students, and other stakeholders. This study—the GPS 4 Success study—is an example of an effort to conduct the institution-specific retention and persistence research called for by some of the field's most well-respected scholars (Braxton et al., 2014; Tinto, 2012a). Specifically, it represents further inquiry into the conditions upon which Tinto's (2012a) latest

framework was built—a worthwhile task not only for myself, but also for the body of knowledge on retention and persistence, and, possibly most importantly, the students and community unique to ICC.

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APPENDIX A

GPS 4 Success Operations Manual

GPS 4 Success Overview

GPS 4 Success is an experimental study that is part of the Robert and Janice McNair Educational Foundation's evaluation efforts to understand programs, practices, and evidence to best serve students. The GPS study is a first-year college program meant to foster and encourage success and help students gain knowledge, skills, thrust needed to persist toward, and accomplish postsecondary success. While the research project specifically targets students graduating in 2016 and enrolling in postsecondary education in the fall, the successful strategies will be revised based on results to meet the needs of future high school graduating classes.

Student Selection

Target Population

Students who graduate from Charles, East Foothills, and Foothills Central who do not receive the Foundation's ROPE Award but enroll in postsecondary education.

2016-17 School Year

Students were randomly selected from the pool of non-ROPE students who self-identified as planning to enroll in postsecondary education after high school graduation.

In the first year, Non-ROPE students selected into the treatment group attending postsecondary education will receive services from the GPS 4 Success navigator. The research study will track postsecondary persistence and completion.

Services

All students in the treatment group will receive services that are [part of] Tinto's (2012) postsecondary retention framework. These four conditions of college success include Expectations, Support, Assessment and Feedback, and Involvement.

Data Collection

The Postsecondary Coordinator will be responsible for maintaining all data collection. Each service will be entered into the McNair Educational Foundation database on a monthly basis. The Postsecondary Coordinator will also maintain case management notes for each individual counseling session and goal planning session, outlining the issue addressed, the action taken and the resolution.

APPENDIX B

Student Perceptions Survey and Open-Response Prompts

McNair Survey & Open-Response Prompts

PARTICIPANT DIRECTIONS
Please complete the short-answer survey questions first.
Then spend approximately 10 minutes on EACH open-ended response question (30 minutes total).
Finally, spend 5 minutes describing the photograph at the end of the survey. Please answer each prompt fully.

Short-Answer Survey Questions

Full Name

Your answer

Gender

- ◯ Male
- ◯ Female

Age

Your answer

Current Major at Isothermal

Your answer

Number of Credits Attempted THIS semester (spring 2017) at Isothermal

Your answer

Did at least one of your parents graduate from a 2-year or 4-year college?

- ◯ Yes
- ◯ No

On a scale of 1 to 5 how has your college experience gone this year?

	1	2	3	4	5	
Not well at all / very poorly	○	○	○	○	○	Extremely well

On a scale of 1 to 5 how likely are you to return to college next year?

	1	2	3	4	5	
Not at all likely	○	○	○	○	○	Extremely likely

On a scale of 1 to 5 how likely do you believe you are you to one day graduate from college with either a degree or certificate?

	1	2	3	4	5	
Not at all likely	○	○	○	○	○	Very likely

On a scale of 1 to 5 how well have your expectations for college (prior to starting) matched your actual experiences in college?

	1	2	3	4	5	
Not at all	○	○	○	○	○	A perfect match

On a scale of 1 to 5 how good of a college match is this school for you?

	1	2	3	4	5	
Very poor match	○	○	○	○	○	Perfect fit

On a scale of 1 to 5 how challenging has your coursework at this college been this year?

	1	2	3	4	5	
Not at all challenging	○	○	○	○	○	Very challenging

On a scale of 1 to 5 how regularly do you get helpful feedback from your professors?

	1	2	3	4	5	
Almost never	○	○	○	○	○	Very regularly

On a scale of 1 to 5 how often do you interact with your professors outside of class (e.g., visiting office hours or helping with research)?

	1	2	3	4	5	
Almost never	◯	◯	◯	◯	◯	Very regularly

On a scale of 1 to 5 how supportive are your loved ones/family of you attending college?

	1	2	3	4	5	
Not at all supportive	◯	◯	◯	◯	◯	Extremely supportive

On a scale of 1 to 5 how challenging has it been to pay for college?

	1	2	3	4	5	
Finances are not an issue	◯	◯	◯	◯	◯	Very challenging

For most of this school year - have you been employed?

- ◯ Yes, working an average of AT LEAST 20 hours per week
- ◯ Yes, working an average of LESS THAN 20 hours per week
- ◯ No, not employed

Please answer the following questions fully (type for 10 minutes each).

How have your family's views on college and education (parents, grandparents, siblings, etc.) impacted your life? Please be specific (type for 10 minutes).

Your answer

Describe the main challenge(s) that you have faced in college this year and any support(s) which have helped you overcome those challenges. Please be specific (type for 10 minutes).

Your answer

Describe any way(s) that you have been involved on campus AND/OR within your community during the past year. Please be specific (type for 10 minutes EACH).

Your answer

Please describe the photograph (type for 5 minutes).

Your answer

Finished? Be sure to hit SUBMIT!

SUBMIT

APPENDIX C

Variable Naming Conventions and Data Dictionary

Variable Name	Variable Description
STUDENT_ID	Unique student identifier
COLLEGE_NAME	Name of postsecondary institution attended (if blank then never matriculated)
INTERVENTION_CAT	Which group did student belong to?
ENROLLED	Did student matriculate to college?
PERSISTED	Did the student persist?
*NOTE	Unique note on student circumstances
*FT_F16	Was student full-time during the fall 2016 semester?
*DROP_ENR_STAT_F16S17	Student drop in enrollment status fall 2016 to spring 2017 (does not include W)
GRADUATED	Did the student graduate?
GENDER	Gender
RACE	Race
ETHNICITY	Ethnicity
ZIP	Home zip code
HIGH_SCHOOL	High school from which student graduated
PREV_CUM_GPA	Student's cumulative high school GPA
*NUM_INT	Total number interventions received
*MIN_DURATION	Min. duration of all services the student received (in hours)
*MAX_DURATION	Max. duration of all services the student received (in hours)
*AVG_DURATION	Average duration of all services received by the unique student (in hours)
*CAT_INT_ABV_CUTOFF	Did the student receive any intervention services above 0.1 hours cutoff?
*NUM_INT_ABV_CUTOFF	How many total services above 0.1 hours student received
*PERC_INT_ABV_CUTOFF	Percent of services above 0.1 hours cutoff student received
*ANY_ASSESSMENT_CAT	Did the student receive any assessment & feedback services?

*NUM_ASSESSMENT	Total number of assessment & feedback services the student received
*PERC_ASSESSMENT	Of all services the student received, percent assessment & feedback
*MIN_ASSESSMENT_DURATION	Of all assessment & feedback services received, min. duration
*MAX_ASSESSMENT_DURATION	Of all assessment & feedback services the student received, max. duration
*AVG_ASSESSMENT_DURATION	Of all assessment & feedback services the student received, avg. duration
*ANY_EXPECTATIONS_CAT	Did the student receive any expectations services?
*NUM_EXPECTATIONS	Total number of expectations services the student received
*PERC_EXPECTATIONS	Of all services the student received, percent expectations
*MIN_EXPECTATIONS_DURATION	Of all expectations services the student received, min. duration
*MAX_EXPECTATIONS_DURATION	Of all expectations services the student received, max. duration
*AVG_EXPECTATIONS_DURATION	Of all expectations services the student received, avg. duration
*ANY_SUPPORT_CAT	Did the student receive any support services?
*NUM_SUPPORT	Total number of support services the student received
*PERC_SUPPORT	Of all services the student received, what percent were support?
*MIN_SUPPORT_DURATION	Of all support services the student received, min. duration
*MAX_SUPPORT_DURATION	Of all support services the student received, max. duration
*AVG_SUPPORT_DURATION	Of all support services the student received, avg. duration
*CAT_SUPPORT_ABV_CUTOFF	Did the student receive any support services above 0.1 hours?
*NUM_SUPPORT_ABV_CUTOFF	How many support services did student receive above 0.1 hours?
*PERC_SUPPORT_ABV_CUTOFF	Percent of the support services student received that were above 0.1 hours
*ANY_CONTRACT_CAT	Did the student discuss GPS 4 Success contract in person with coordinator?
*NUM_CONTRACT	How many contract services
*ANY_COURSE_REG_CAT	Did the student receive any course registration services?
*NUM_COURSE_REG	How many course registration services did student receive?

*PERC_COURSE_REG	Percent of all services that the student received which were course registration
*ANY_FIN_AID_COUNSEL_CAT	Did student receive any financial aid counseling services?
*NUM_FIN_AID_COUNSEL	How many financial aid counseling services did student receive?
*RECEIVE_FEEDBACK_CAT	Did the student receive assessment and feedback services?
*NUM_RECEIVE_FEEDBACK	How many receive feedback services did the student receive?
*RECEIVE_SUPPORT_CAT	Did the student receive any support services?
*NUM_RECEIVE_SUPPORT	How many support services did the student receive?
*UNDERSTAND_EXPECT_CAT	Did the student receive any understand expectations services?
*NUM_UNDERSTAND_EXPECT	How many understand expectations services did the student receive?
*IND_TEXT_CAT	Did student participate in any individual text message correspondence?
*NUM_IND_TEXT	How many individual text message correspondences did the student have?
*MASS_TEXT_CAT	Did student receive any mass text message services?
*NUM_MASS_TEXT	How many mass text message services did student receive?
*TWO_FOUR_CAT	Did student receive any 2- and 4-year planning services?
*NUM_TWO_FOUR	How many 2- and 4-year planning services did student receive?
*GRAD_FAFSA_CAT	Did the student receive any FAFSA counseling?
*NUM_GRAD_FAFSA	How many FAFSA counseling services did the student receive?
*PERC_GRAD_FAFSA	Of all services the student received, what percent were FAFSA counseling?
*IND_COUNSELING_CAT_OVERALL	Did student receive any individual counseling services?
*NUM_IND_COUNSELING_OVERALL	How many individual counseling services did the student receive?
*PERC_IND_COUNSELING_OVERALL	Of all services student received, percent which were individual counseling
*SURVEY_PART	Was the student one of the survey respondents?
CITY	Home city
PREV_CORE_GPA	Student's high school core GPA

ENROLLMENT_MAJOR_1	First major of choice
ENROLLMENT_STATUS	e.g., full-time, three-quarters-time, half-time, less than half-time
CLASS_LEVEL	e.g., associate's, certificate
*CLASS_LEVEL_A_CAT	Was the student working on an associate's degree?
COLLEGE_TYPE	2- or 4-year
INSTITUTION_TYPE	public or private
CAT_AFRAM	African American
CAT_AMINDIAN	American Indian
CAT_ASIAN	Asian
CAT_CAUC_WHITE	Caucasian
CAT_MULTI_RACIAL	multi-racial
HISP_LAT_CAT	1 = HIST/LAT; 0 = NOT HISP/LAT
CHARLES_CAT	Did the student attend Charles High?
EAST_FOOTHILLS_CAT	Did the student attend East Foothills High?
FOOTHILLS_CENTRAL_CAT	Did the student attend Foothills Central High?

** Denotes a created variable*

APPENDIX D

Correlation Matrix Used for Variable Reduction

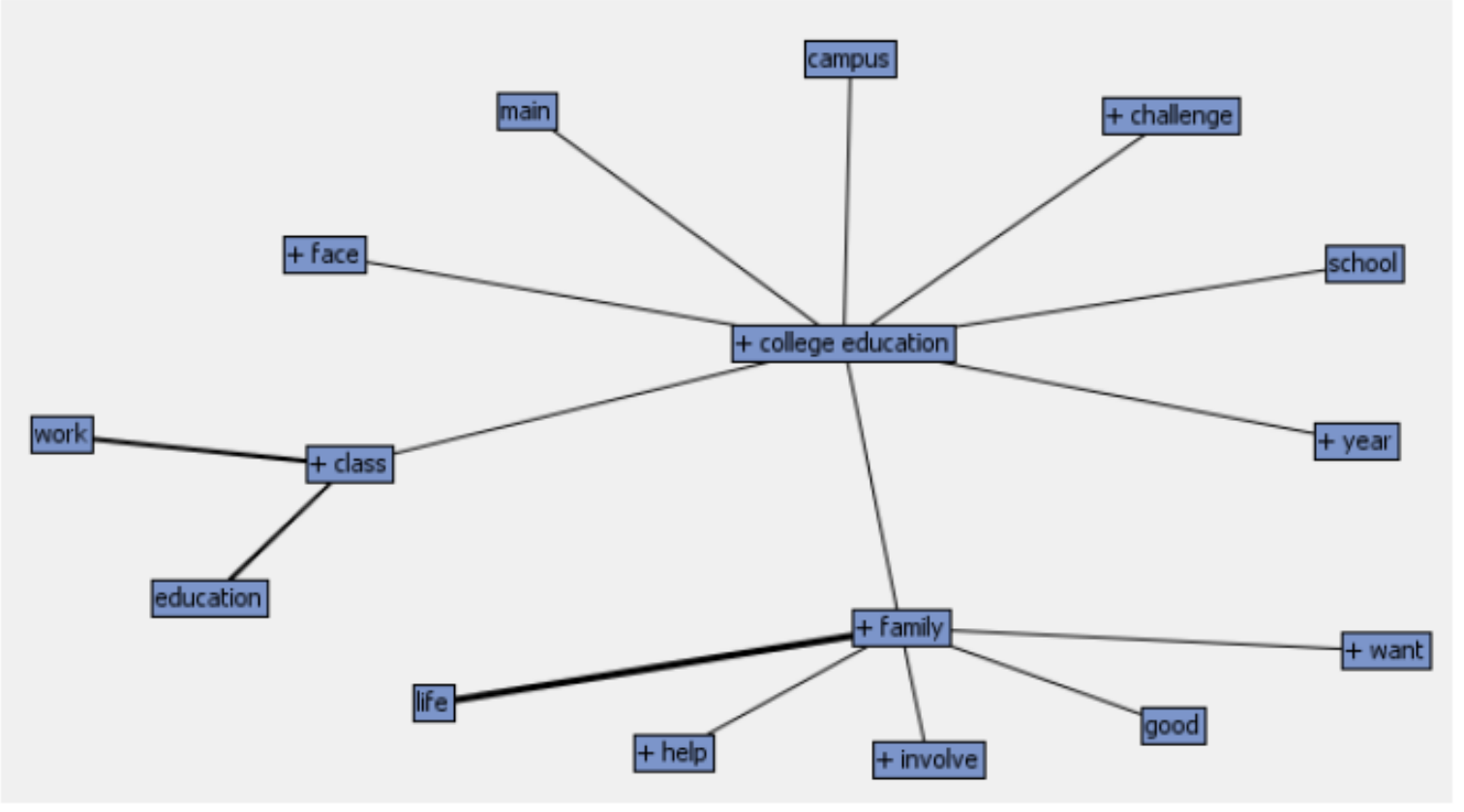
Correlation Matrix Used for Variable Reduction to Answer Research Question 2

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	FT_FTE	1.00																																
2	DROP_ENRL_STAT_FTESTF	0.16	1.00																															
3	GENDER	-0.19	-0.30	1.00																														
4	PREV_CUM_GPA	0.19	0.19	-0.27	1.00																													
5	AVG_DURATION	0.78	-0.01	-0.25	0.18	1.00																												
6	CAT_INT_ASN_CUTOFF	0.73	-0.00	-0.23	0.27	0.83	1.00																											
7	PERC_INT_ASN_CUTOFF	0.67	0.06	-0.45	0.25	0.59	0.64	1.00																										
8	NUM_ASSESSMENT	0.71	0.27	-0.42	0.21	0.72	0.57	0.45	1.00																									
9	NUM_EXPECTATIONS	0.16	0.27	-0.34	0.29	0.39	0.53	0.57	0.05	1.00																								
10	NUM_SUPPORT	0.66	-0.03	-0.31	0.21	0.33	0.39	0.65	0.37	0.44	1.00																							
11	PERC_SUPPORT	0.19	-0.31	0.22	0.14	-0.02	0.13	0.23	-0.07	-0.01	0.39	1.00																						
12	MAX_SUPPORT_DURATION	-0.66	0.22	-0.36	0.24	0.26	0.42	0.77	0.59	0.49	0.72	0.26	1.00																					
13	AVG_SUPPORT_DURATION	-0.11	0.02	-0.32	0.16	0.21	0.43	0.59	0.35	0.36	0.79	0.26	0.89	1.00																				
14	CAT_SUPPORT_ASN_CUTOFF	0.62	0.14	-0.34	0.23	0.23	0.53	0.69	0.46	0.63	0.53	0.24	0.78	0.91	1.00																			
15	AMT_COURSE_REG_CAT	0.16	0.26	-0.43	0.18	0.32	0.33	0.63	0.56	0.50	0.59	0.12	0.72	0.72	0.63	1.00																		
16	NUM_COURSE_REG	0.13	0.30	-0.38	0.07	0.28	0.28	0.56	0.55	0.41	0.51	0.13	0.71	0.69	0.62	0.83	1.00																	
17	PERC_COURSE_REG	0.12	0.33	-0.32	-0.03	0.36	0.28	0.45	0.55	0.41	0.25	0.03	0.69	0.59	0.53	0.84	0.89	1.00																
18	AMT_PIN_AID_COUNSEL_CAT	-0.19	0.00	-0.33	0.27	0.00	0.17	0.40	0.11	0.14	0.55	0.16	0.51	0.51	0.33	0.33	0.26	0.16	1.00															
19	RECEIVE_SUPPORT_CAT	0.67	-0.10	0.26	0.07	0.37	0.25	-0.62	0.35	0.32	0.25	0.52	0.31	0.07	0.07	0.29	0.37	0.17	0.30	1.00														
20	IND_TEXT_CAT	-0.10	0.14	-0.24	0.17	0.33	0.53	0.75	0.59	0.76	0.55	0.14	0.75	0.79	0.66	0.63	0.52	0.53	0.31	0.32	1.00													
21	PASS_TEST_CAT	0.73	-0.01	0.25	0.16	0.25	0.17	-0.16	0.43	0.40	0.15	0.24	0.61	-0.17	-0.02	0.04	0.05	0.01	-0.07	0.09	0.15	1.00												
22	TWO_FOUR_CAT	0.14	0.00	-0.15	0.22	0.09	0.75	0.39	0.77	0.57	0.31	-0.04	0.39	0.19	0.29	0.31	0.24	0.24	0.09	0.05	0.10	0.56	1.00											
23	GRAD_FAFSA_CAT	0.13	-0.12	-0.14	0.12	-0.13	0.07	0.30	-0.24	-0.22	-0.17	0.15	-0.19	0.15	0.13	-0.16	-0.12	-0.12	-0.07	-0.79	-0.22	-0.55	-0.31	1.00										
24	IND_COUNSELING_CAT_OVERALL	-0.24	0.00	-0.16	0.16	0.21	0.37	0.78	0.45	0.47	0.65	0.24	0.79	0.75	0.71	0.56	0.52	0.35	0.44	0.23	0.71	0.09	0.35	-0.16	1.00									
25	NUM_IND_COUNSELING_OVERALL	-0.16	0.17	-0.12	0.19	0.10	0.27	0.54	0.39	0.26	0.69	0.15	0.63	0.55	0.50	0.61	0.33	0.21	0.17	0.15	0.50	0.03	0.24	-0.10	0.71	1.00								
26	CLASS_LEVEL_A_CAT	0.35	0.04	-0.02	0.06	-0.07	-0.07	0.00	0.11	0.08	0.19	0.17	0.02	0.04	0.00	0.01	0.02	0.02	-0.26	0.01	-0.04	0.11	-0.12	0.17	-0.20	-0.27	1.00							
27	CAT_AFRAM	0.83	0.14	-0.25	-0.14	0.24	0.15	-0.65	0.25	0.09	-0.19	-0.12	-0.16	-0.17	-0.10	0.07	-0.07	-0.01	-0.15	0.09	0.09	0.11	0.20	-0.06	-0.15	0.10	-0.13	1.00						
28	CAT_CAUC_WHITE	-0.81	-0.07	0.26	0.25	-0.37	-0.28	0.69	-0.48	-0.27	0.19	0.10	0.03	0.06	-0.14	-0.20	-0.10	-0.34	0.25	-0.17	-0.27	-0.21	-0.37	0.12	0.09	-0.04	0.09	-0.53	1.00					
29	CAT_MULTI_RACIAL	-0.19	-0.05	0.07	-0.13	0.05	0.15	0.10	0.15	0.09	0.04	0.05	0.08	0.09	0.05	0.07	0.27	0.24	-0.15	0.03	0.05	0.11	0.20	-0.06	0.21	0.02	-0.01	-0.13	-0.53	1.00				
30	HISP_CAT_CAT	0.62	0.01	-0.25	-0.05	0.24	0.13	0.66	0.21	0.24	-0.09	-0.10	0.05	0.09	0.24	0.17	0.06	0.11	-0.13	0.08	0.24	0.09	0.17	-0.05	-0.09	-0.10	0.09	-0.10	-0.45	-0.10	1.00			
31	CHASE_CAT	0.16	-0.06	-0.03	-0.08	0.02	0.03	-0.14	-0.29	0.00	-0.28	0.00	-0.37	-0.23	-0.25	-0.31	-0.24	-0.22	-0.22	-0.16	-0.29	-0.08	-0.03	0.32	-0.35	-0.33	0.12	0.62	-0.07	0.23	-0.17	1.00		
32	EAST_RUTHERFORD_CAT	-0.62	0.12	-0.14	-0.13	0.23	0.16	0.26	0.47	0.35	0.04	-0.36	0.12	0.19	0.35	0.34	0.26	0.35	-0.33	-0.07	0.35	0.02	0.28	-0.13	0.24	0.24	0.04	0.00	-0.37	0.00	0.69	-0.42	1.00	
33	RE_CENTRAL_CAT	-0.19	-0.05	0.17	0.19	-0.24	-0.17	-0.17	-0.29	-0.24	0.29	0.26	0.29	0.18	-0.10	-0.07	-0.05	-0.17	0.50	0.29	-0.05	0.05	-0.25	-0.14	0.07	0.05	-0.16	-0.11	0.43	-0.29	-0.25	-0.04	-0.43	1.00

APPENDIX E

Sample SAS Concept Map and Text Filter

Example of SAS Concept Links to the term *College Education*



Example of SAS Text Filter by the term *College Education*

RESPONSE	TEXTFILTER4_SNIPPET	.	.	.	RETAINED
My family's views on college and education have impacted my life, both of my parents went to college and have good jobs they enjoy. They have always taught me how important it is to have a good education and have a college degree so I can be successful as well. They also help me in my decision making with classes. The main challenges that I have faced this semester is math, it has never been my strongest subject and it has taken me longer than expected to get through it. My teachers have been very patient and helpful and do everything they can to help me in the areas that I struggle with. I have been involved in the community by helping my high school swim team this past year at meets by timing and running errands. I have also taught children how to swim that do not know how.	... 's views on **college** and **education** have impacted my ... parents went to **college** and have good jobs they ... have a good **education** and have a **college degree** ...	..	..	..	0.0
My family's views on college helped influence me to actually attend a two year college before transferring. I was a bit nervous about moving away from home in such a short amount of time. Attending JCC has been one of the best decisions ever made for myself and my family. It's close to home, I got to keep my job for 3 years, and the schedules are very pleasing. My family has very strong views on education because I grew up with grandparents who had to quit school and take care of their families, they stress to me that education is they key to finding a good job and having a good life. It has really impacted my life in a good way because I think that if they hadn't stressed it to me enough, I most likely wouldn't be attending today. The main challenges I've had this year would mainly be the tests that come with any course. I have a friend who takes mostly the same classes as me and we help each other quite a bit with studying for tests, quizzes, and any other assignments.	... 's views on **college** helped influence me to actually ... a two year **college** before transferring. I was ... strong views on **education** because I grew up with ...	..	..	..	1.0
My mom and dad did not attend college after high school. My mom has always wanted me to attend college, and she has always pushed me to do my best. My parents struggled because they didn't have a college education, so it is one of my goals to finish school. The main challenges I have faced in college this year is being able to keep up with all of the work with all of my classes. Because of this I bought a planner so I could write down all of the assignments, quizzes, and tests that I will have. During my first semester I struggled with studying. I didn't really know how to study, or where to start. I improved on that my second semester of college. A few months ago I attended sports day on campus.	... did not attend **college** after high school. My ... me to attend **college,** and she has always ... n't have a **college education**, so it is one ...	..	..	..	1.0
My dad never even stepped foot into a high school, which has impacted his abilities to find a supportive job. As a result of that, we have lived poorly for most of my life. My dad used to roof houses which was extremely hard work, with little payoff. He agrees that if he had finished high school, and went to college we could have had a much better chance at living a little better. My mom went to college to get her CNA. When she worked she made a good amount of money (in our eyes). However, this job was not what she wanted to do, and was hard on her mentally. She eventually decided that it was not worth the extra income. These situations	... and went to **college** we could have had a ... mom went to **college** to get her CNA. ... to get an **education**, but I went it ...				

APPENDIX F

GPS 4 Success Framework

GPS 4 Success Framework

GPS 4 Success Framework

In each of the four areas of the postsecondary study framework, there are specific services students in the treatment group are receiving:

Expectations

GPS 4 Success Contract

- All students will sign a contract which outlines expectations for the student as part of the program and services which will be provided by the Postsecondary Coordinator.

Summer Workshop

- A 4-hour workshop was held the month prior to the beginning of the 2016 fall semester. Content covered the *Roadmap to College Success* (steps to be a successful college student), course registration, self-advocacy, and campus resources.

Support

Monthly Contact

- The Postsecondary Coordinator will make contact with every student a minimum of two times per month. These contacts may be through text messaging, phone calls, or social media. Contacts will be messages for the large group, not individuals.

Individual Counseling

- As needed, the Postsecondary Coordinator will provide individual counseling to students to assist them with:
    - ✓ preparing for course registration;
    - ✓ linking with campus resources;
    - ✓ handling financial aid issues;
    - ✓ completing the transfer process; and
    - ✓ other areas where a student may need assistance.

  This may occur face-to-face, by phone or other messaging methods. The Postsecondary Coordinator will have eight hours of

established weekly office hours. For students on the campus of Foothills Community College, the Postsecondary Coordinator will hold weekly office hours on the campus. For students at any other campus, the Postsecondary Coordinator will be available by phone or in the McNair Educational Foundation office.

Assessment and Feedback

Goal-planning session

- The Postsecondary Coordinator will meet face-to-face with each student one time per semester. During this meeting, the Coordinator will use the *Roadmap to Success* to assess where the student is in the academic, financial, social, and other areas. The student will use this tool to develop a plan for the upcoming semester.

Involvement

Social

- The Postsecondary Coordinator will provide socials/events during major college breaks (fall, winter, spring). These events will provide an opportunity for students to build peer networks as well as strengthen the supportive relationship with the Postsecondary Coordinator.

APPENDIX G

GPS 4 Success Initial Student Survey

GPS 4 Success

Please answer the following questions.

Last Name

Short answer text

First Name

Short answer text

Middle Name

Short answer text

Phone Number

Short answer text

Can you receive Text Messages at this number?

- Yes
- No

Email Address (other than school email)

Short answer text

Street Address

Short answer text

City

Short answer text

College you will be attending Fall 2016

Short answer text

Major

Short answer text

Have you completed the FAFSA

- Yes
- No

Have you taken a Placement test for your College?

- Yes
- No

APPENDIX H

McNair Educational Foundation Assent Forms

ROBERT & JANICE MCNAIR EDUCATIONAL FOUNDATION

Dear 12th Grade Parent/Guardian:

The McNair Education Foundation is inviting your 12th grader to participate in an educational postsecondary (or college) research study. This letter will give you information about the study. Should you not want your child to participate this letter will describe how to make sure that your child does not take part in this study.

We, as educators, see great value in ensuring that all students in [redacted] County—and the country—have the opportunity to go to college. This study will help enrolled students stay in college by providing resources and supports to assist them as they transition to college life.

What is the McNair Postsecondary Study?
Funded by the McNair Education Foundation, the purpose of the study is to provide students with resources and supports in college with the goal that they will stay in college and either graduate or obtain a credential.

How many people will take part in this study?
If your child is in this study, your child will be one of at least 200 students participating.

What will your child be required to do as a participant in this study?
Your child is being asked to participate in this study because he or she is a 12th grader attending a [redacted] County high school. There is no cost or obligation associated with being in the study. If your child is in the study, they will complete a short survey about where they plan to attend college.

When in college during the 2016-17 year, they may be chosen to receive support services that will assist them in navigating the college process and ultimately staying in college to receive a degree or credential. These supports could include assistance with preparing for college, navigating course planning and registration, financial aid, tutoring, career exploration, transfer from one college to another, or other barriers that may arise during the college experience.

How long will your child participate in this study?
If your child is in this study, they will actively participate from the spring of 2016 until they graduate from college or for six years after high school, whichever comes first. If your child goes to college, his or her college progress will be monitored for up to six years. The study will only monitor enrollment information and participation in study services, not college grades. Your child can leave the study at any time without penalty. You or your child may contact [redacted] at [redacted] or [redacted] to alert us of you or your child's desire to no longer participate in this study.

What are some general things you should know about research studies?
You are being asked to allow your child to take part in a research study. Joining the study is voluntary. You may withdraw your permission for your child to be in the study, for any reason, at any time. Even if you give your permission, you or your child can decide not to be in the study or to leave the study early. If your child leaves the study, your child can rejoin the study at a later date.

Research studies are designed to obtain new knowledge. This new information may help people in the future. Details about this study are discussed below. It is important that you understand this information so that you and your child can make an informed choice about being in this study. You and your child should ask the McNair staff named above, or staff members who may assist them, any questions you have about this study at any time.

What are the possible benefits from being in this study?
Educational research is designed to benefit society by gaining new knowledge. Your child may also expect to benefit by participating in this study by gaining increased knowledge about college life and how to be successful while in college. The information gained by your child's participation in the study may not only help your child, but may also help [redacted] County Schools do a better job of preparing students for college.

ROBERT & JANICE MCNAIR EDUCATIONAL FOUNDATION

What are the possible risks involved with participating in this study and how will my child's privacy be protected?
There are no risks outside of normal education practices and those possible risks from participating in the study include:

Only approximately 100 students will be chosen to receive services from the McNair Postsecondary Study. If your child is not chosen to receive college support services, they will still have data collected on them during the study in order for researchers to determine if the support services were beneficial.

Data from participating students will be housed in a secure database. Student's information will be unidentified for data analysis purposes. All data has the possibility of being hacked, and while we will ensure all federal policies in protecting data, data breeches can occur. Should this happen, all participants will be notified. Participants *will not* be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, the McNair Education Foundation will take steps allowable by law to protect the privacy of personal information. In some cases, your child's information in this study could be reviewed by representatives of [redacted] County Schools or research sponsors for purposes such as quality control or safety.

What if you or your child has questions about this study?
You and your child have the right to ask, and have answered, any questions you may have about this study. Your child can leave the study at any time without penalty. If you have questions or concerns, you should email nvandyke@rcsnc.org.

If you want your child to participate:
If you **DO** want your child to participate in this study, you don't need to send any paperwork back to their school.

If you do not want your child to participate:
If you **DO NOT** want your child to participate in this study, please complete the form below, detach it, and have your child submit it to the McNair office by May 13, 2016. You or your child is also welcomed to contact [redacted] at [redacted] or [redacted]

Withdrawal
Your child can leave the study at any time without penalty. If you or your child decides that either of you no longer wishes to participate in the study, please feel free to contact [redacted] at [redacted] or [redacted]

Only complete this section if you **do not** wish for your child to participate in the study.

My child, _____, will **not** be participating in the McNair College Study
Child's Name (Print)
being conducted by the McNair Education Foundation. My child attends _____
Name of child's high school
High School.

_____
Parent's name (Print)

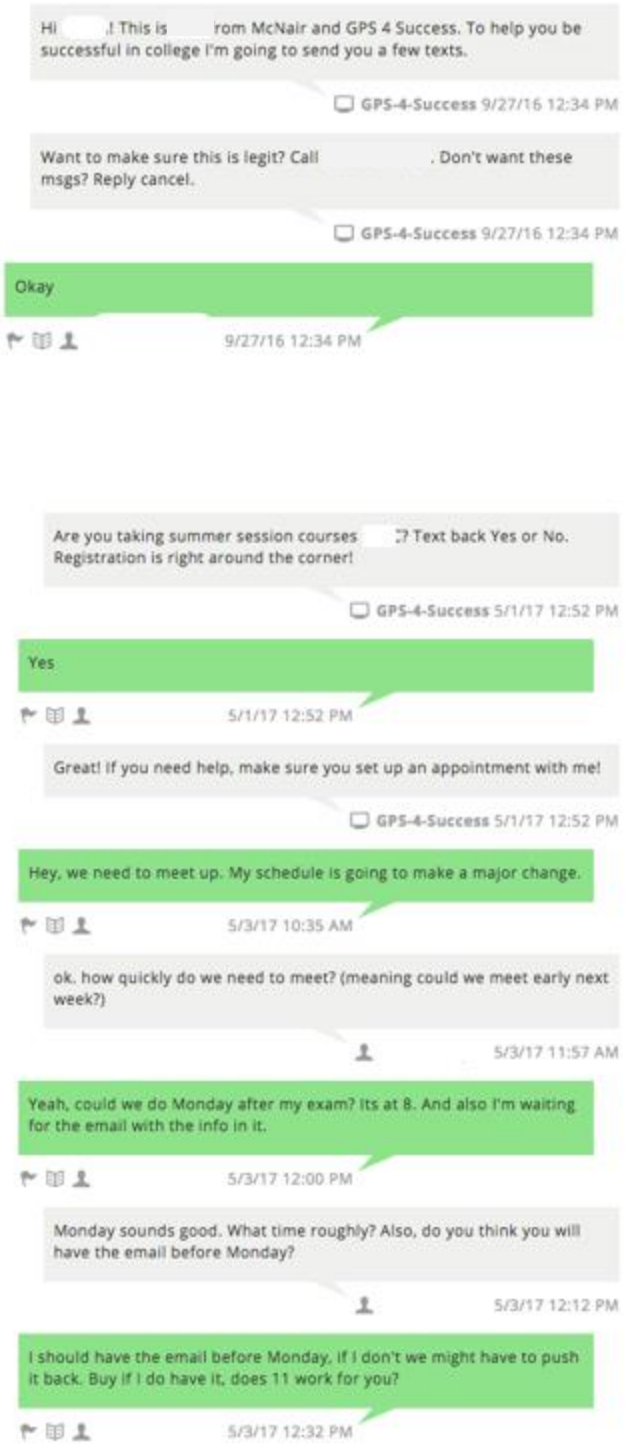
_____
Parent's name (Signature)

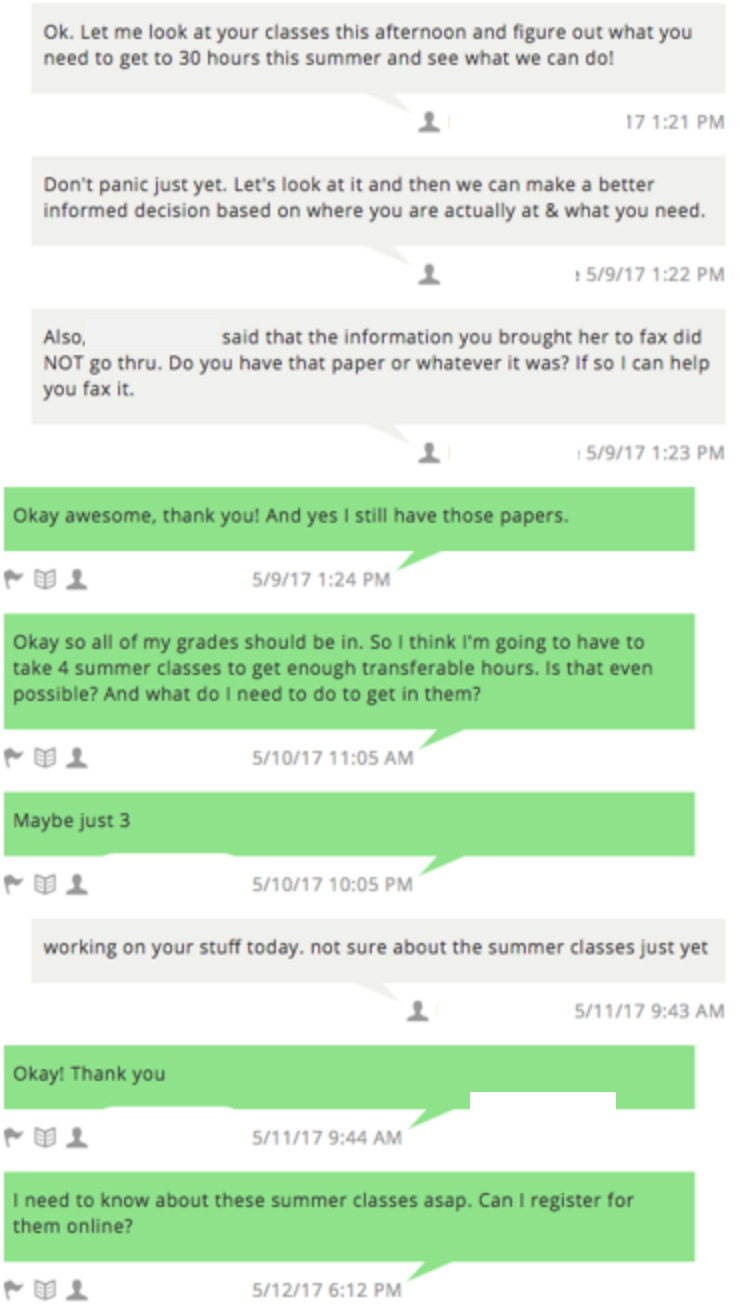
_____
Date

McNair Educational Foundation

APPENDIX I

Sample GPS 4 Success Group and Individual Text Communication


Hi .! This is rom McNair and GPS 4 Success. To help you be successful in college I'm going to send you a few texts.
GPS-4-Success 9/27/16 12:34 PM
Want to make sure this is legit? Call . Don't want these msgs? Reply cancel.
GPS-4-Success 9/27/16 12:34 PM
Okay
9/27/16 12:34 PM
Are you taking summer session courses ? Text back Yes or No. Registration is right around the corner!
GPS-4-Success 5/1/17 12:52 PM
Yes
5/1/17 12:52 PM
Great! If you need help, make sure you set up an appointment with me!
GPS-4-Success 5/1/17 12:52 PM
Hey, we need to meet up. My schedule is going to make a major change.
5/3/17 10:35 AM
ok. how quickly do we need to meet? (meaning could we meet early next week?)
5/3/17 11:57 AM
Yeah, could we do Monday after my exam? Its at 8. And also I'm waiting for the email with the info in it.
5/3/17 12:00 PM
Monday sounds good. What time roughly? Also, do you think you will have the email before Monday?
5/3/17 12:12 PM
I should have the email before Monday. If I don't we might have to push it back. Buy if I do have it, does 11 work for you?
5/3/17 12:32 PM


Ok. Let me look at your classes this afternoon and figure out what you need to get to 30 hours this summer and see what we can do!
17 1:21 PM
Don't panic just yet. Let's look at it and then we can make a better informed decision based on where you are actually at & what you need.
5/9/17 1:22 PM
Also, said that the information you brought her to fax did NOT go thru. Do you have that paper or whatever it was? If so I can help you fax it.
5/9/17 1:23 PM
Okay awesome, thank you! And yes I still have those papers.
5/9/17 1:24 PM
Okay so all of my grades should be in. So I think I'm going to have to take 4 summer classes to get enough transferable hours. Is that even possible? And what do I need to do to get in them?
5/10/17 11:05 AM
Maybe just 3
5/10/17 10:05 PM
working on your stuff today. not sure about the summer classes just yet
5/11/17 9:43 AM
Okay! Thank you
5/11/17 9:44 AM
I need to know about these summer classes asap. Can I register for them online?
5/12/17 6:12 PM

APPENDIX J

Appalachian State University Institutional Review Board

Documentation

Submitted for review on March 15, 2017

Approval date May 1, 2017

IRB Number 17-0253

IRB irb@appstate.edu via adminliveunc.onmicrosoft.com May 1

to me, dentitham

To: Nathan Weigl
Mathematical Sciences
CAMPUS EMAIL

From: Lisa Curtin, PhD, IRB Chairperson
Date: 5/01/2017
RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Agrants #: Currently Not Available
Grant Title: Sponsors: McNair Foundation

STUDY #: 17-0253
STUDY TITLE: Improving Community College Retention and Persistence: An Inquiry into Tinto's Retention Framework at the Two-Year Level
Submission Type: Initial
Expedited Category: (5) Research Involving Pre-existing Data, or Materials To Be Collected Solely for Nonresearch Purposes
Approval Date: 5/01/2017
Expiration Date of Approval: 4/30/2018

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

All approved documents for this study, including consent forms, can be accessed by logging into IRBIS. Use the following directions to access approved study documents.

1. Log into IRBIS
2. Click "Home" on the top toolbar
3. Click "My Studies" under the heading "All My Studies"
4. Click on the IRB number for the study you wish to access
5. Click on the reference ID for your submission
6. Click "Attachments" on the left-hand side toolbar
7. Click on the appropriate documents you wish to download

Approval Conditions:

Appalachian State University Policies: All individuals engaged in research with human participants are responsible for compliance with the University policies and procedures, and IRB determinations.

Principal Investigator Responsibilities: The PI should review the IRB's list of PI responsibilities. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records.

Modifications and Addendums: IRB approval must be sought and obtained for any proposed modification or addendum (e.g., a change in procedure, personnel, study location, study instruments) to the IRB approved protocol, and informed consent form before changes may be implemented, unless changes are necessary to eliminate apparent immediate hazards to participants. Changes to eliminate apparent immediate hazards must be reported promptly to the IRB.

Approval Expiration and Continuing Review: The PI is responsible for requesting continuing review in a timely manner and receiving continuing approval for the duration of the research with human participants. Lapses in approval should be avoided to protect the welfare of enrolled participants. If approval expires, all research activities with human participants must cease.

Prompt Reporting of Events: Unanticipated Problems involving risks to participants or others; serious or continuing noncompliance with IRB requirements and determinations; and suspension or termination of IRB approval by an external entity, must be promptly reported to the IRB.

Closing a study: When research procedures with human subjects are completed, please log into our system at https://appstate.myresearchonline.org/irb/index_auth.cfm and complete the Request for Closure of IRB review form.

Websites:

1. PI responsibilities: http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI%20Responsibilities.pdf

2. IRB forms: http://researchprotections.appstate.edu/human-subjects/irb-forms

CC:
Audrey Dentith, Leadership & Edu Studies

Vita

Nathan Andrew Weigl has been teaching math since 2004. He has taught subjects ranging from remedial algebra through calculus II at the high school level in Maryland and, more recently, at the college level in North Carolina. Mr. Weigl's interest in postsecondary retention and persistence began out of concern for his own math students. It grew markedly while working as an intern at the National Council for Community and Education Partnerships as part of his Ed.D coursework. Today, Mr. Weigl strives to implement the four conditions upon which his dissertation is built—expectations, assessment and feedback, support, and involvement (engagement)—into his own classes in an effort to best serve his students.

Mr. Weigl holds degrees from the University of Arizona (BS, Secondary Mathematics Education) and Towson University (MS, Secondary Mathematics Education). He currently serves in the role of Senior Lecturer in the Department of Mathematical Sciences at Appalachian State University. Mr. Weigl lives with his wife, Elizabeth, and their two children in Boone, NC.