FIRST-YEAR STUDENT RETENTION: MAP-WORKS™ EARLY WARNING AND INTERVENTION RELATIONSHIPS

by

DEREK A. JACKSON

B.S., Emporia State University, 1989
M.S., Kansas State University, 1993

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Special Education, Counseling and Student Affairs
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Abstract

This study investigated first-year student retention by assessing the MAP-Works^{TM} retention program and faculty interventions. First-year students were assessed and identified by level of retention risk in their first semester. This study sought to determine if the MAP-Works^{TM} program and resulting intervention were effective in predicting the retention of high-risk, first-semester freshman students to their second semester and second year. The participants for this study were all first semester freshman students enrolled during the academic years 2012 and 2013.

The data analysis for this study used quantitative data analysis methods. The first and second research questions asking which of the factors were significant in predicting retention were answered using independent samples t-tests. The third research question, testing if the intervention was significant, was answered using a 2x2 Chi-square test for independence. The fourth, and final, research question testing which of the factors contributed the most in predicting retention, was answered using a direct (binary) logistic regression analysis.

This study found for high-risk domestic students: Cumulative GPA, Socio-Emotional, Test Anxiety, Peers, Homesickness: Distressed, Academic Integration, Social Integration and Environment were associated significantly with retention from fall-to-spring semester. For international students: GPA, Self-Efficacy and Self-Discipline were found to be associated significantly with retention. The study showed for fall-to-fall retention for domestic students that cumulative GPA, Socio-Emotional, Communication, Analytical, Social Integration and On-Campus Living Social were significant and International Students: Commitment and Homesickness: Distressed were significantly

associated with retention. The research found that the intervention conducted by their direct connects for high-risk domestic students was significant for fall-to-fall retention.

The logistic regression analysis showed for domestic students that Cumulative GPA, Financial Means, Socio-Emotional, and ACT Composite score were significant for fall-to-fall retention. The strongest predictor of retention was Cumulative GPA followed by Socio-Emotional, Financial, then ACT Composite score. The regression analysis for high-risk international students showed that Cumulative GPA, Gender, and Student Residence were significant for fall-to-fall retention. The strongest predictor of retention was cumulative GPA, Gender (Female) and Student Residence (Off Campus).

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This study investigated the use of the MAP-Works™ program that is designed to help retain first-year students by identifying the level of retention risk for each student early in their first semester and communicating this risk to key university faculty and staff. The participants for this study were all first semester freshman students enrolled during the academic years 2012 and 2013.

This study sought to determine if the MAP-Works™ program and resulting intervention were effective in predicting the retention of high-risk first semester freshman students to their second semester and second year.

The data analysis for this study used quantitative data analysis methods. The first and second research questions asking which of the factors were significant in predicting retention were answered using independent samples t-tests. The third research question asking if the intervention was significant was answered using a 2x2 Chi-square test for independence. The fourth and final research question asked which of the factors contributed the most in predicting retention was answered using a direct (binary) logistic regression analysis.

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Dedication

I would like to dedicate this dissertation to my wife, Michella and my daughters Anna and Elise. I know that my best work on this earth is to be your husband and father. I hope you know how much I love each of you and look forward to the future of our family.

Chapter 1 - Introduction

On February 24, 2009, when the nation's economy was mired in a recession, President Obama addressed a joint session of Congress identifying several key strategies to improve the United States of America's economic destiny, one of which was a need to improve citizens' educational standing. In President Obama's speech, he called for changes in educational system with the following message:

> In a global economy where the most valuable skill you can sell is your knowledge, a good education is no longer just a pathway to opportunity – it is a pre-requisite. Right now, three-quarters of the fastest-growing occupations require more than a high school diploma. And yet, just over half of our citizens achieve that level of education. We have one of the highest high school drop-out rates of any industrialized nation. And half of the students who begin college never finish. (Obama, 2009)

Obama (2009) went on to say that it was his goal, by the year 2020, the United States would once again boast it has the highest percentage of college graduates. (Obama, 2009)

Governor Mark Parkinson on August 25, 2009 addressed the Kansas Board of Regents about significant issues facing Kansas, and in particular, his concerns with its regent schools. He highlighted three concerns: national rankings of the state's regent schools, freshman retention and graduation rates, and accountability for the success of the graduates after school. While all three are tied together, rankings are in part made up from retention rates and graduation rates. Governor Parkinson's (2009) comments were specific about his expectations for retention and graduation rates for the regent schools:

> The retention of college freshmen and the ultimate graduation rates of those freshmen in the United States is dismal. Only 60% of freshmen who enter a four year university in the United States graduate within the next six years. KU's retention rate is 81 percent, its graduation rate is 60 percent; K-State's retention rate is 79% and its graduation rate is 58 percent; ... I've asked you to hold the institutions accountable for their rankings, as well as retention and graduation rates. I'm also asking you to hold them accountable for what happens to the students that do graduate. (2009)

Governor Parkinson outlined the expectation that the regents and each institution develop a ten-year strategic plan to address these three primary concerns. He instructed that the strategic plans should not be based upon increased funding but instead they should use better systems to understand successes of programs, and if necessary, the elimination of programs that are not producing the desired results with increased funding and space given to programs that produce results. (Parkinson 2009)

Kansas State University President Kirk Schulz and his Leadership Cabinet created a 2025 Visionary Plan with the goal to be a top 50 public research institution. One of the eight metrics that used to judge if they are in the top 50 is to compare freshman retention rates against national averages at other top public research institutions chosen as competitive peer institutional points of reference for K-State (Kansas State University Office of the President, 2011).

With increasing pressure from the President of the United States, the Governor of Kansas, and the President of Kansas State University to retain students, it is important to understand how retention is defined and measured, and ultimately, to know how retention

can be impacted. Tinto's theory (1987, 1988, 1993) of student retention indicates that many factors contribute to a student's retention and overall success in a university setting. A student has many attributes, which include family background as well as skills and gifts prior to entering college that shape each student's goals, aspirations, and level of commitment. Student goals and commitment levels interact with the institutional experience, both in the formal classroom setting and the informal out of classroom social setting. The extent that a student becomes integrated into both of these settings will determine how likely it is that a student will stay or leave an institution (Seidman, 1996).

It is important to understand that Kansas State University should be concerned about freshmen retention and graduation rates in response to growing governmental pressure to succeed. However, they also need to be aware that prospective students and families are also pressuring institutions like Kansas State University to be more successful at graduating students. A prospective student may choose to not enroll in schools with poor graduation rates.

With the passing Senate Bill 580 (1990) of the Student Right-to-Know and Campus Security Act institutions are now required to publish their graduation rates. Prospective students and their parents can make judgments and comparisons between universities based on this published rates. The implication of this comparison of degree completion rates is that a student enrolling in a particular institution has a greater chance to graduate if he or she attends an institution with a higher graduation rate (Astin, 2006).

As the pressure to increase student retention rises, limited information, resources, and time negatively impact an institution's ability to make effective decisions to improve retention. With limited resources and a call for a systems approach to retention practices,

many universities are turning to commercial enterprises because they have products that collect data to help solve the riddle of improving retention. One such commercial enterprise, Educational Benchmarking Incorporated (EBI), was developed, in conjunction with Ball State University, a product called Making Achievement Possible (MAP-Works™). (2102) Kansas State University began using the MAP-Works™ product in the fall of 2010 for all new first semester freshman students.

Introduction of Topic

The use of the MAP-Works™ program is designed to help retain first-year students past their first-year by identifying the level of retention risk for each student early in their first semester and communicating this risk to key university faculty and staff who are deemed as Direct Connects for each student. This program uses a student self-assessment instrument that combines pre-loaded ACT scores, along with student responses to the MAP-Works™ instrument-generated student report to determine the level of concern for retention at a particular university. The instrument is distributed electronically to all first-time, first semester freshman students in their first few weeks of school; shorter checkup surveys are sent later in the fall, at the start of the spring semester, and midway through the spring semester. Participation with the instrument is not required but is highly encouraged through a letter from the Provost and Vice President of Student Life as well as from freshman course instructors and living group leaders. The data gathered from students' responses to statements from the instrument focus on the following: demographics of the student, parent's education level, career and educational aspirations, current residence, academic major, special categories, prior or current military service, or student athletic status.

Along with demographic questions, the instrument has questions in the following Success Marker areas: Academics, Performance and Expectations, Financial Means, Socio-Emotional Standing, and Behaviors and Activities. In each of these areas, a student and their university designated direct connect are given a risk assessment report that uses a Likert scale shown in color form. The green designation indicates a low level of concern, yellow indicates a medium level of concern, and red indicates a high level of concern. This information is provided to the student along with identified resources that will help address questions or concerns in a particular area at the university. The student's information will also be made available to the student's designated direct connects, who are trained to respond to a student if they pose a high level of concern for retention. The program objective is to have a student meet with a university trained professional to address the student's issues that are leading to a high retention risk level.

Purpose of the Study

The purpose of this study was to determine if the MAP-Works™ program was effective in assistance of retaining high-risk, first-time, first semester freshman students to their second semester and second year compared to other high-risk first-time first semester freshman students who did not participate in the MAP-Works™ program. This study investigated and identified which MAP-Works™ risk factors that were significant in predicting retention for high-risk students to the second semester and second year.

Research Questions

The research questions addressed by this study were as follows:

1. Were high-risk students who persisted to the second semester associated with different Success Marker scores (i.e., risk factors) than those who did not persist?
2. Were high-risk students who were retained to the second year associated with different Success Marker scores (i.e., risk factors) than those who were not retained?
3. Did first-time, first semester freshman students, who were rated as high-risk on the retention scale from the MAP-Works™ program, have a higher probability of retention from fall semester to spring semester and retention to their second year after an intervention by a trained faculty or staff compared to a high-risk student who did not receive an intervention?
4. Do the six Success Markers (i.e., risk factors) ─ Academic, Behavior & Activities, Financial Means, and Socio-Emotional ─ along with composite ACT score, cumulative GPA, or other independent variables (Gender, Race and Student Residence) predict retention to the second year for high-risk students?

Definitions

ACT. Abbreviation for American College Testing; this is a standardized test that high school students take as a part of admission criteria for college or university admittance. For this study, the ACT is a preloaded element for each student and plays a part in a student's predicted success at a college or university.

Direct Connect. A faculty or unclassified staff member who is given responsibility for a subset of students for the MAP-Works™ program. Each staff member

is trained to use the MAP-Works™ system and is a direct connect to a student because of their relationship with the student, such a classroom instructor, academic advisor, college or department administrator, residence hall coordinator, Greek Affairs staff, or Office of Student Life staff.

Freshman. First semester, first-time, new to the university student.

High-risk. A student who is at a high level of risk for retention from the fall semester to the spring semester based on a report generated by the MAP-Works™ program. There are three levels of risk: low, medium, and high.

Intervention. For the MAP-Works™ program, each student who is high-risk for retention would be invited into one of their direct connects offices to discuss the concerns raised. Each direct connect would have the ability to help resolve a student's concerns using the resources of the university. The direct connect would do follow-up as necessary.

Living Group Leader. For the MAP-Works™ program, students are broken into subsets based on where they live. The residence life coordinator is the direct connect if a student lives on campus; the Assistant Director for Greek Affairs is the student's direct connect if a student lives in a Greek House; and the Office of Student Life staff members are a student's direct connect if a student lives off campus.

MAP-Works™. A retention product developed by Educational Benchmarking Incorporated along with Ball State University.

Retention. For this study, the student is deemed retained to the second year if he or she is still enrolled after the twentieth class day in their second fall semester.

Success Markers. The MAP-Works™ program identifies areas of concern for retention risk by group in the following categories: Academic, Socio-Emotional, Performance and Expectations, Behavior and Activities, and Financial Means. For the purposes of this study, the combined ACT score and the cumulative GPA are the "Performance and Expectations" success markers being assessed.

Stop Out. A phrase used to describe students who take time off of school to earn additional money to support their next semester of college expenses. The student is not dismissed and intends to return, usually a semester later.

Significance of the Study

The purpose of this study was to identify the Success Markers and Factors that were significant in retaining students into their second year. This purpose was accomplished by investigating the effectiveness of the MAP-Works™ program in predicting those students at risk for retention. In addition, this study determined if the faculty and staff intervention was effective in retaining high-risk first-year students. Since the institution was allocating resources, both in terms of money and time, to help retain students past their first-year on campus, the ability to investigate the effectiveness of such a program would be critical to the institution reaching its stated retention goals. The state of Kansas and the regents who govern the campus are demanding improvement in retention across their institutions without increasing the overall cost of higher education. Providing data to the leadership of the institution related to this retention effort may be of importance for future decisions.

Limitations

This study is not without its limitations and concerns. The first limitation in this study is the fact that the research questions and the significant findings are only able to be used as noted differences in retention and should not be construed as having caused greater retention. Because this study was only looking at post-hoc data the details of why each student was retained or not retained cannot be proven out by this study.

Another limitation is with the logistic regression. The data that was used in the model was only looking at the high-risk for retention students and not the entire data set with all of the students regardless of their risk category. What was learned by this study should be applied with caution or at all to the entire populations. Future regression research that studies the entire population will be important in understanding what contributes to the retention for all students regardless of risk.

A third limitation for this study lies within the MAP-Works™ program. The MAP-Works™ program is a proprietary commercial product and it was not possible to obtain the analytic information that makes up the risk ratings. This study was not able to report what contributes to the numerical risk level for each Success Marker or Factor.

The final limitation or concern is point out that the MAP-Works™ program was purchased by Kansas State University to help retain first-year students to the second year. A case could be made that this study needed to show that the MAP-Works™ program was successful in identify the risk levels of the students and what was significant in predicting retention. This research was not influenced in any form by the relationship with the MAP-Works™ program or staff.

The following are limitations of this study:

1. This study was only measuring one institution and its response approach to high-risk freshmen and their MAP-Works™ retention survey.
2. This study was only looking at two years of data for this program.
3. International students within this study were a small subgroup.
4. This study is only making noted differences between high risk students.

Summary

This study investigated first-time first-year students who were rated as high-risk for retention by the MAP-Works™ program and which of the Success Markers and Factors were significant in predicting retention from the fall semester to the spring semester and to their second year. This study also investigated whether first-time first-year students who were rated as high-risk for retention by the MAP-Works™ program had improved retention rates from the fall semester to the spring semester and to their second year when an intervention was conducted by trained faculty and student services staff. The analysis used data collected from the MAP-Works™ first-year transition survey offered at Kansas State University in fall 2012 and 2013.

This dissertation consists of five chapters. Chapter One provides a summary of the issues related to retention, the purpose of the study, research questions, and the significance of the study. Chapter Two is an overview of the literature related to student retention, theoretical framework for student retention, and drop-outs. Chapter Three contains the research questions, hypotheses, and the methods related to the quantitative research procedure. Chapter Four contains the results of the quantitative analysis. Chapter Five discusses the summary, conclusions and research recommendations.

Chapter 2 - Review of the Literature

Introduction

With ever-increasing pressure to retain students to graduation, getting a successful start in the students freshman year is one of the most important elements universities are addressing in their attempts at improving the retention of students to graduation. The first-year, and even more critically, the first few weeks of the first semester, are important times when students are deciding if they belong in college (Pascarella & Terenizini, 1991). Universities are allocating time, attention, and resources to identify tools and tactics to improve retention of student to their second year and ultimately to graduation.

In 1993, nearly 2.4 million students entered colleges, and nearly 1.5 million of them did not complete a degree at their first institution. Of these 1.5 million students, approximately 1.1 million did not complete a degree at all (Tinto, 1993). Tinto (1988) stated,

> Several studies, and a wide array of anecdotal evidence from counselors and student advisors alike, argue that the forces that shape departure during the first-year of college, especially during the first six weeks of the first semester are qualitatively different from those that mold departure in the latter years of college. (p. 439)

In the study of student attrition and retention, the work of Tinto (1988, 1990, 1993) has become some of the most highly regarded. Tinto's work is important for two reasons. The first reason is that the work differentiates between academic failure and voluntary withdrawal because of a student's dissatisfaction with their experiences. The second reason is due to his development of a model to explain drop-out. His model of

student withdrawal is based upon a student's interaction both in the classroom and out of the classroom. Tinto believes that they both have an impact. A student's commitment to their academic pursuits and their institution is strengthened by their interactions with their peers and other university support staff outside of the classroom. They also experience an increase in commitment when their outside experiences are integrated with their classroom experiences (Forbes, 2009).

Another important researcher in the area of retention, Bean (1983, 1985) proposed an explanatory model of student drop-out. His model included variables outside of the institution, environmental issues, and the student's intentions about staying or leaving a college. Bean (1980) uses Price's model of employee turnover to help explain the attrition of college students. Bean (1980) indicated that his work on student retention is very similar to previous research on workplace attrition. Students will leave institutions of higher education almost exactly like they leave their workplace. Students who find the institution that they attend to be one that is unresponsive, incompetent, or unfriendly are likely to transfer or stop attending altogether (Bean, 1983, 1985).

As noted by Tinto (1987), a multitude of factors need to be examined for their part in student drop-out. Several key areas to be examined for retention are Social Integration, Financial Issues, Involvement/Participation, Commitment to Earning a Degree and Academic Connectedness. These areas of concern are closely related to the factor areas in the MAP-Works^{TM} instrument that will be explained in more detail later in this chapter.

Social Integration

As students arrive on campus, one of the most important factors in their finding success is related to how they integrate into their college of choice. Forbes (2009), Tinto (1975), and Bean (1980) indicate a students' commitment to their higher education institution is enhanced by social integration, and the more students are socially integrated, the greater their commitment. Astin (1984) argues that students are likely to leave an institution due to feeling homesick. He attributes this to a loss of friendships in the transition to college. In addition, the inability to make new friends causes an overall feeling of loneliness as well as not being connected to the institution. The result is a student who leaves the institution. Poyrazali and Lopez (2007) stated that international students are a little different than domestic students as they have social integration challenges. They have a greater chance for homesickness and it is elevated when there is a greater difference in cultures.

Financial Issues

Students who are at risk for drop-out often face a steep battle financially, sometimes too steep to overcome. When studying the reasons for drop-out, it was determined that only 15 percent of students drop-out because of academic reasons (Kalsner, 1991), indicating that there are many other reasons that students drop-out. One of those reasons is the cost of education. Financial aid plays a role in assisting students' ability to maintain themselves in college until graduation. In one study at a large public institution, it was found that students who received work-study aid positively affect the graduation rate. In this same study, students who received merit aid were more likely to

be retained to graduation (DesJardin, 2002). Having access to enough financial support either through work-study or scholarships improves a student's chance of graduation.

Another common concern related to financial issues is the ability for a family to help financially support their student in the pursuit of a degree. A study by Horn, Peter, and Rooney (2002) identified the most common risk factors associated with drop-out of postsecondary education. They found that one of the most common risk factors is financial stress. They indicated that students who are independent financially from their families or those working fulltime are less likely to persist to graduation.

The same socio-demographic factors that influence high school graduation rates are significant in influencing a college student's success towards graduation (Whitaker & Pascarella, 1994). An example of one socio-demographic measure that impacts both high school and college completion is family income. The greater the ability for the family to financially support their student in college, the more likely the student will complete a degree (1994).

Involvement/Participation

Student involvement theory indicates that the more a student has in-depth interactions and connections with faculty, staff, and peers, the more success they will have in their social and academic endeavors (Astin, 1984). Astin (1984) explains that involvement is an investment of the student's psychosocial and physical energy. Their involvement is continuous and does vary in the amount of energy based upon the student. The involvement is both qualitative and quantitative in nature. The students' human development is directly related to their involvement levels. Finally, the academic performance of the student is correlated to their involvement level.

In Tinto's (1993) academic departure model, the concepts of student connectedness and involvement are the most meaningful as they contribute to the student's overall social, academic, and campus resource connections. Being connected in this model demonstrates that students' connections help them identify and feel that they are a part of the academic experience. Tinto (1993) suggests that faculty and student interactions and the students' connectedness to the institution are key indicators of a students' likeliness to be retained to graduation. Students' sense of belonging to the institution is central to their retention.

Commitment to Earning a Degree

The stronger the commitment that students make to their higher educational experience and to their established goals that lead toward graduation, the more determined they will be to following through on their own expectations for college completion (Braxton, Vesper, & Hossler, 1995; Noel & Levitz, 1989). Tinto's (1987, 1993) research indicates that student retention is based upon commitment to the educational process and the social and academic connection to the classroom environment and classroom culture. Bean (1985) describes academic integration as having an impact on institutional fit and connectedness. His suggestion is that effective academic integration is due to developing good study habits, gaining confidence as a student, and thinking along the same lines as the faculty teaching their courses.

Because it is known that students are not just dropping out for academic reasons, it is even more critical to understand the other factors that compel students to drop-out, including integration into the community, motivation, and incongruence of a student's expectation towards their academic life. Without this understanding, colleges and

universities will be less successful in helping students find the resources and support they need (Lotkowski, V.A., Robbins, S.B., & Noeth, R.J., 2004).

Commitment to an institution is one of the most important elements for student retention. Bean (1980), in his initial work on the development of a model of student attrition, found that the largest single contributor to student retention was their commitment to the institution. Bean went on to describe several variables that contribute to the likelihood for retention with commitment to the institution and academic performance, shown by a student's GPA, being the key elements that determine if students will stay until completion.

Connectedness

Three of the most important developmental milestones for college-age students are the development of occupational skills, social connections, and self-efficacy to live on their own (Chickering & Reisser, 1993). Students' subjective feelings of connection with their campus community was found to be significant in their retention to graduation and their academic achievements (Allen, J., Robbins, S.B., Casillas, A., &Oh, I., 2008). Bean (1980) showed in his attrition model that membership in a student organization was the third highest predictor of student retention.

Connectedness socially is also important during times of academic stress. The more connected students are to their community and peers, the more support and resources are available to manage stress (Cohen & Wills, 1985). A student's mental well-being is a predictor of retention and grade point average (Eisenberg, Golderstein, & Hunt 2009). In Eisenberg et al.'s (2009) study of students with mental health issues, it

was found students who were depressed were twice as likely to drop-out of school as non-depressed students.

Whitlock (2006) found in her study of connectedness in secondary school settings that a student's perceived connectedness resulted from several elements: the availability of adults, decision making authority in social and academic settings, and creative engagement and academic engagement. A case can be made that first-year students in their first few weeks of college are similar developmentally to high school students and their connection to an adult. In higher education, a faculty or staff person will help raise students' feelings of connectedness.

In managing university resources towards retention, institutions will be most successful focusing their energy and efforts on students in their first-year of school by helping them get on the path to graduation (Levitz et al., 1999). Levitz et al. (1999) stated,

> Very few institutions today have unlimited resources for helping students get a good start in college. Therefore, an institution that is able to direct resources of time, energy, and money toward students who are most likely to be prone to drop-out, who most need and want help, and who are willing to be helped has truly leveraged it resources (p. 41).

The retention of freshman students is influenced the greatest by their institutional fit and this institutional fit factor reduces significantly as they are retained to their sophomore, juniors, and seniors years (Bean, 1985).

Current Retention Methods

In 2010 ACT stated that improving advising practices is the most frequent way institutions are addressing retention improvements. ACT (2010) identified that more than 80% of the institutions surveyed who are trying to reduce the attrition rate were focusing on the following areas: advising (increasing or improving, interventions, financial aid, career counseling), internships, curricular changes, remedial or enhancement programs (tutoring, writing lab, library orientation), orientation (student, parent), programs for honors students, college sponsored social activities, and residence hall programs. Four year schools reported to ACT that the practices with the highest success of retention were academic advising centers, advising interventions with selected student populations, comprehensive learning assistance centers, supplemental instruction, programs for first generation students, requirements to live on campus, reading centers, tutoring, summer bridge programs, extended freshmen orientation with credit, programs for honors students, and integration of advising with first-year student transition programs (ACT, 2010).

The common thread in effective retention programs is student and faculty contact in either one on one or a small group environment (Barefoot, 2000). In a recent study, Christenson (2011) found that students were more likely to be retained if they make a contact on campus. Christenson (2011) stated,

> Outside of friends and family, there were a few students who were influenced by campus staff. Direct contact with advisors, faculty in first-year classes, and residence hall staff played a role in encouraging and guiding students to make a connection on campus. (p. 1)

MAP-Works™

MAP-Works™ is a program designed to help improve retention of college students through earlier and directed intervention with students who are identified as high-risk. MAP-Works™ was originally developed by Ball State University in 1990. In 2006, Educational Benchmarking Incorporated (EBI MAP-Works™) purchased the rights to the program and moved it to an integrated web survey, database, and communication system. As such, MAP-Works™ is a highly developed program that utilizes their own assessment tool to help universities with retention of their students through gaining more traceable information early in the school year so that interventions can be put in place for high-risk students. The EBI research team continues to inform its work with retention research and theory development conducted in part by the following researchers: Upcraft, Gardner and Associates; Astin and Skipper; Chickering and Reisser; and Tinto (MAP-Works™ 2012).

The MAP-Works™ system uses institutional data uploaded into the database by the institution's administrator; for the past two years, Kansas State University has uploaded information on all first-year, first-time freshmen who take classes at the Manhattan campus. The information uploaded into the system includes the student's name, home address, campus address, email address, student eID (university student identification number), telephone number, academic major, academic advisor, ACT scores, gender, race/ethnicity, residency, parents education level, first generation student status, number of credit hours, and university designated direct connects. Along with uploaded information, each student is requested to respond to a fall transition survey between the fourth and sixth weeks of their first semester. This survey asks questions in

the following success marker areas: academic, performance and expectations, socio-emotional, behaviors and activities, and financial means. Each of the success markers are further comprised of individual factors in the following areas: commitment to the institution, communication skills, analytical skills, self-discipline, time management, financial means, academic behaviors, self-efficacy, peer connections, homesickness separation, academic integration, social integration, satisfaction with institution, on-campus or off-campus social aspects, living environment, roommate relationship, and test anxiety.

At the completion of the survey, students receive a response on their risk for retention based upon their preloaded data and responses to the questions. In each area of the instrument, the student receives feedback in relation to retention risk for that area. The student receives this feedback at the end of the instrument. If a retention risk is noted, the student is given a list of campus resources that will help the student in their specific area referenced. The response back to the student also uses peer comparison information to help students understand if they are within the norm for study time and other academic measures. Once students have completed a survey, their direct connects are also able to see their report and responses as well as their overall risk level for retention. The process at Kansas State University has been set up so the direct connects reach out to the student about the results, and they invite the student in for a meeting to discuss the results and to aid the student in getting support and access to resources to help with retention concerns. The system also allows for all of the direct connects to log their interaction with the student and what plan was developed for resolving the issues. Another critical feature is that all direct connects can see all the notes from other

connects about the student so they can all be part of the support in helping this student overcome issues of concern.

Summary

If an institution is striving to improve freshman retention as well as the overall graduation rate for their university, then it is important to find out why students are struggling, and just as important, to discover this quickly in the cycle, prior to students deciding that they should leave. The work a university is doing with MAP-Works™ will begin to address a variety of deciding factors for why a student may choose to leave, as well as link the struggling student to campus faculty and staff who can identify necessary resources to help the student work through difficult factors related to retention.

Bean's (1980) generalized description of the student, for both women and men, who leave an institution remains informative for this complex issue still facing higher education today:

> From this study, one may characterize a man who dropped out as follows: The student was not committed to the institution, did not have a high university GPA, was satisfied with being a student, did not believe that the education he was receiving was leading to his development, found his life repetitive, did not know the social and academic rules of the institution well, and lived with his parents. One may characterize a woman who dropped out as follows: The student was not committed to the institution, did not perform well in high school, did not belong to campus organizations, did not believe that going to college would lead to employment, perceived an opportunity to transfer, did not believe that education leads to self-development, did not find daily life at college repetitive, was not

> committed to getting a bachelor's degree, was not satisfied with being a student at the institution, knew the social and academic rules of the institution, did not participate in decision making, did not feel that she was being treated fairly, and did not meet with staff and faculty members informally. (Bean, 1980)

Scholars and researchers have long desired to understand why a student is or is not retained. This interest is based upon a recognition that a student who graduates with a degree is setting themselves up for further status attainment in society, self-development, helping meet the challenges of life in the future, and finally the likelihood of increased human capital. The interest is also centered on the fact that retention theories have had a direct impact on the practice of retention for institutions and has been found to be successful. Retention studies are critical to institutions for them to prove their relevancy to retain and graduate more students and thus prosper (Education Encyclopedia, 2012).

Chapter 3 - Methodology

Research Design

This study was an ex post facto design investigating the relationships between first-year students' risk factors, as indicated as high-risk on the MAP-Works™ instrument for retention, and the intervention activities of university faculty and staff direct connects. Quantitative research methods were chosen to investigate the relationships between the different independent and dependent variables. Campbell and Stanley (1963) indicated this type of research is quasi-experimental. It closely follows their thoughts that this is a type of cross sectional research design that is similar to a static group comparison design (p. 8).

The population for this study was the fall of 2012 and fall of 2013 first-time first semester freshman students' who through a combination of their high school ACT scores, preloaded demographics, and responses to the MAP-Works™ survey were classified as high-risk for retention. This study examined whether the intervention by the direct connects led to increased retention to the spring semester and retention to the second year over students who also were identified as high-risk but did not receive an intervention. The interventions in this study were performed by university faculty and staff instructed on how to use the MAP-Works™ system. Direct connects met in person with the identified high-risk students who responded to their invitation for a meeting. This study also investigated whether there was a difference in retention of the high-risk students based upon six Success Markers and twenty Factors that make up the Success Markers.

Research Questions

This study examined the following questions related to the retention of first-time first semester freshman students who were classified as high-risk by the MAP-Works™ instrument and received an intervention by their direct connect based upon their being classified as high-risk. This study investigated which Success Markers and Factors were more predictive for retention or retention of a student; it also sought to determine if a student's GPA and high school ACT score along with an intervention impacted the retention or retention of the student.

The research questions addressed by this study were as follows:

1. Were high-risk students who persisted to the second semester associated with different Success Marker scores (i.e., risk factors) than those who did not persist?
2. Were high-risk students who were retained to the second year associated with different Success Marker scores (i.e., risk factors) than those who were not retained?
3. Did first-time first semester freshman students, who were rated as high-risk on the retention scale from the MAP-Works™ program have a higher probability of retention from fall semester to spring semester and retention to their second year after an intervention by a trained faculty or staff compared to a high-risk student who did not receive an intervention?
4. Do the six Success Markers (i.e., risk factors) ─ Academic, Behavior & Activities, Financial Means, and Socio-Emotional ─ along with composite ACT score, cumulative GPA, or other independent variables (Gender,

Race and Student Residence) predict retention to the second year for high-risk students?

The research hypotheses were as follows:

1. Students who persisted to the second semester were associated with higher Success Marker scores (i.e., risk factors) than those who did not persist.
2. Students who were retained to the second year were associated with higher Success Marker scores (i.e., risk factors) than those who were not retained.
3. Students who were rated as high-risk and received an intervention by trained faculty or a staff person were retained to their second year at a higher level than those students who did not have an intervention.
4. Retention of high-risk students who returned for the fall semester of their second year was predicted by the Success Marker scores and/or other independent variables.

Research Location

This research project focused on first-year students at Kansas State University in Manhattan, Kansas during the fall semesters of 2012 and 2013. According to the Office of Planning and Analysis (1995), the total student population for fall 2012 was 24,378, and in fall 2013 it was 24,581. The undergraduate enrollment for fall 2012 was 19,853 and in fall 2013 it was 20,169. The Office of Planning and Analysis Big Twelve Longitudinal Retention Survey reported that first-time first-year students (freshman) in 2012 totaled 3786, and in 2013 they totaled 3,754. The reported overall freshman retention rate for fall 2012 was 81.19%, and retention for the fall 2013 was 83.24% .

Sample

The population for this study was Kansas State University, Manhattan Campus, first-time first semester freshman students for the fall of 2012 and 2013 who were determined to be high-risk for retention based on the MAP-Works™ instrument. According to the Office of Planning and Analysis Student Demographic Report in the fall of 2012 there were 3,897 first-time full-time freshman and in 2013, 3,776 first-time full-time freshman (p.1). All freshman students who were enrolled at the Kansas State University, Manhattan campus were invited, through different communication means, to participate in the MAP-Works™ survey. The instrument was available through an online web link between their fourth and sixth week of the fall 2012 or 2013 semester. In each year, more than 3500 students were invited to take the survey, and in both years more than 55% responded, with more than 290 returning each semester noted as being at high-risk for retention concern from the fall semester to the spring semester.

The MAP-Works™ data were provided for this study by the campus MAP-Works™ coordinator. The study focused on students who were rated in this high-risk category. The data for this study included the Success Markers that constitute each student's overall risk evaluation, as well as the interaction log that each direct connect kept as a part of the tracking system when conducting an intervention with a high-risk student. The MAP-Works™ data were compared to second semester and second year 20th class day enrollment status of students to determine their retention status.

Instrumentation

The following information about the MAP-Works™ program is taken from a paper provided by Educational Benchmarking Incorporated, the organization who owns

the MAP-Works™ program and survey (2012). The paper is titled "Foundation of MAP-Works™: Research and Theoretical Underpinnings of MAP-Works™." The premise for this research is based upon a first-year student taking part in the MAP-Works™ program: "MAP-Works™ is a web-enabled, comprehensive, integrated, student retention and success platform created through a partnership between EBI MAP-Works™ and Ball State University. MAP-Works™ empowers faculty and professional staff to impact student success and retention while directly educating students about transition issues" (p. 3). The program was started in 1988 by Ball State University and is based on retention research conducted and performed by Pascarella, Terenzini (1992) and Tinto (1993). The underlying concern is to provide timely feedback to students, faculty, and staff regarding a student's ranking on the five Success Markers in their early first semester performance. Timely feedback allows concerns to be addressed quickly and in a concerted manner. In 1994, Educational Benchmarking Incorporated (EBI) joined with Ball State University to take the program beyond that campus. EBI also developed an interactive and robust web platform. The EBI research team continues to inform its work with retention research and theory development conducted in part by the following researchers: Upcraft, Gardner and Associates; Astin and Skipper; Chickering and Reisser; and Tinto (MAP-Works™ 2012).

First-year students were offered an opportunity to participate in this program in the early part of their first semester, usually between the fourth and sixth week. Students were encouraged to participate through many different channels. They were encouraged by their first-year experience classroom faculty, academic advisor, living group advisor,

and the leadership of the university, who in this case were the Provost and Vice President of Student Life. The volunteer participation rate was more than 55%.

Students were informed that the program is a non-confidential program as their direct connects will see their results. The direct connects were usually their academic advisor, living group supervisor, or first-year experience faculty members. Students received a response after they had completed the instrument; this response indicated their risk assessment in the five success marker areas. The response also included helpful links in each of the success marker areas and information about where appropriate academic and support resources were located on the campus to address concerns indicated in their MAP-Works™ response.

The statistical foundation for the MAP-Works™ (MAP-Works™, 2012) program during the first fifteen years with Ball State University was one in which the program was supported with several research studies to "evaluate the questions, the reliability of the student responses and the statistical validity of the data. Qualitative and quantitative studies were also conducted to gather both student and staff experiences with the data to establish its usefulness" (p. 7). EBI also conducts face validity tests with both students and with experts in the field to understand if the instrument is actually testing what it says it does. EBI also conducted tests to determine the reliability of the factors using Cronbach's Alpha; all of the factors scored above a .62 with many of the factors scoring much higher (see Appendix A reliability scale). EBI continues to perform statistical tests to check for validity and correlations as additional campuses and years produce more data to both strengthen and inform the instrument (MAP-Works™ 2012).

Data Collection Procedures

The data used in this ex post facto study originated from Kansas State University's MAP-Works™ program as well as from the Office of Planning and Assessment. The information provided included the entire freshmen class and their demographics, their level of risk in their first semester as determined by the MAP-Works™ program, the interaction logs and notation of intervention between the direct connect and their student with details of the interaction and their enrollment status for the second semester and second year. The direct connects were Kansas State University faculty and staff who have documented their intervention interactions within the MAP-Works™ management logs. The logs were reviewed to determine if an intervention occurred with the high-risk students and if these interventions were significant in their retention.

Data Analysis

The data analysis for this study used a combination of quantitative data analysis methods. The first and second research question and hypotheses were answered using independent samples t-tests. The third research question and hypotheses were explored using a 2x2 Chi-square test for independence. The fourth research question was answered using a direct (binary) logistic regression analysis with forced entry. Huck (2004) described logistic regression as a means to measure the independent and control variables and determine if there is predictive value in identifying outcomes.

Reliability and Validity

The nature of the study was ex post facto, allowing the researcher to have no interaction with the students. The use of institutional data for this study was important in

that it protected the research findings from threats to the validity of the research. The participants in this study and the researcher never came into contact during this research. Therefore, there was no concern over any researcher biasing any of the study participants. The participants did not experience a pre-test and post-test design or have multiple treatments related to this study.

Opportunity for threats to the validity of this study did exist in several of the factors of this research. Retention is the major component of this study. Within this study there are implications that retention is impacted by one or more of the factors. As no contact was made with each student after their departure from the campus there is no way in identifying directly which of the components impacted their lack of retention.

Another threat to validity was the use of the MAP-Works™ survey. According to MAP-Works™ (2012), the instrument has been tested extensively for reliability and validity. They used face validity measures involving researchers, practitioners, and students to verify that the instrument was measuring what was important and that the questions were worded correctly for both content and that there was no double meaning questions. They also tested for both convergent and divergent validity based upon suggestions from theory to validate that the instrument was confirming the relationships among the questions and factors. MAP-Works™ also has tested their instrument using factor analysis to validate the items among the scales and factors. Finally they have tested the reliability of the instrument using Cronbach's Alpha reporting that all of the factor scales report a reliability of .62 or above, with more than half of the twenty scales having a reported reliability .80 and higher. This instrument has been accepted as reliable and valid. See Appendix A for reported reliability.

Protection of Human Rights

The necessary forms protecting the rights of the subjects were submitted to the Committee for Research Involving Human Subjects Institutional Review Board (IRB) at Kansas State University during December of 2014. The researcher also passed the necessary training modules that are required by the IRB prior to applying for permission for this study. The researcher was notified by the IRB that the proposal was determined to be exempt from further review in December of 2014. All data were secured during the entire time of the research, and identifying information was removed from the data file and replaced with unique identification numbers.

After the initial data was analyzed for fit, all identifying information during and after the analysis was conducted and reported in the aggregate form. Students were never identified during this study and their identifying information was not included in this study.

Chapter 4 - Data Analysis

This study investigated first-year freshman retention results using the MAP-Works™ program data along with the effect of faculty and staff led interventions for students who were classified by the MAP-Works™ program as the highest risk for retention. This study also investigated the relationships that each of the five Success Markers, calculated from twenty factors, had with the retention of participating students. The MAP-Works™ program includes each study participant's composite ACT score and their fall and spring cumulative GPAs to determine the comparative scores of each on fall-to-spring retention and fall-to-fall retention as well. Chapter 4 contains the description of the population, results and description of the analyses used for this study, and hypothesis testing for each of the four research questions.

Sample

All first-year freshman students at Kansas State University, Manhattan campus, in fall 2012 and 2013 were encouraged to participate in the MAP-Works™ program. All freshmen from 2012 and 2013 were included in this study and each student was assigned a retention risk level assessment, which is composed of their MAP-Works™ survey scores and high school ACT score. First-year freshman for this study are defined as those students who enrolled, matriculated and attended class during the first week of the fall semester. These students also needed to be attending college full-time for the first-time. Many of the students in this study did have transfer credits from Advanced Placement Courses and from concurrent enrollment programs that allowed for credits to be earned during their high school enrollment. The combined dataset for fall 2012 and 2013 resulted in 7,903 first-time freshmen. The next two sections describe the population in

terms of demographic and academic characteristics that contributed to the analysis of retention among first-time freshmen in 2012 and 2013. In addition, the two dependent variables, fall-to-spring retention and fall-to-fall retention, are described in the third section below.

Demographic Variables

Demographic information included gender, race, and residence. The dataset was almost equally divided between females and males (Table 4.1).

Table 4.1. Frequency distribution by gender.

Gender	Number	Percentage
Female	3969	50.2
Male	3934	49.8
Total	7903	

White non-Hispanics accounted for more than three quarters of the population, while Asian, American Indian, Alaskan Native, and Hawaiian or Pacific Islander accounted for less than 2% of the population. International students were grouped together, regardless of race or ethnicity, reflecting how the MAP-Works™ program categorized them. Students who did not disclose their racial identity also constituted less than 2% of the population. Multi-racial, Black or African-American, non-Hispanic, and Hispanic students contributed almost equal proportions to the total population of freshman students (Table 4.2).

Table 4.2. Frequency distribution by race/ethnicity

Race/Ethnicity	Number	Percentage
White Non-Hispanic	6173	78.1%
Black or African-American, Non-Hispanic	385	4.9%
Hispanic	319	4%
Multi-Racial	398	5.0%
Asian	79	1%
American Indian, Alaska Native, Pacific Islander	32	0.4%
International	401	5.1%
Undisclosed	116	1.5%

Although freshman students may live either on-campus in the residence halls or off-campus, the majority of students in this study lived on-campus (see Table 4.3)

Table 4.3. Frequency distribution by place of residence

Residency	On-Campus	5512	69.7%
	Off-Campus	869	11%
	Did not disclose	1522	19.3%

Academic Variables

Academic characteristics included overall risk level, composite ACT scores, first semester and first-year cumulative grade point averages (GPA), number of direct connect interventions, fall-to-spring retention, and fall-to-fall retention. Since the primary attention of this investigation was the high-risk students from the MAP-Works™ program, Table 4.4 shows the overall risk level of all of the study participants.

Table 4.4. Frequency distribution by overall risk level

Overall Risk	Low	5765	72.9%
	Moderate	561	7.1%
	High	1577	20%

In this study the composite ACT score and the first-year cumulative GPA were included as two of the independent variables. Table 4.5 summarizes the academic characteristics based upon retention and retention.

Table 4.5. Academic characteristics 2012 and 2013

	N	ACT	Fall GPA	Spring GPA	First-year Cum GPA
All Students	7911	24.35	2.851	2.789	2.93
Spring Persisted	7184	24.529	2.983	2.861	2.969
Spring Did Not Persist	727	22.273	1.487	-	-
Fall-to-fall Retention	6257	24.725	3.090	2.985	3.076
Fall-to-fall Did Not Retain	927	22.580	1.908	1.671	2.145

For this study, another independent variable was whether or not the study participants who were rated as high-risk received an in-person intervention by one of their direct connects. Each student was assigned at least two direct connects who were responsible for reaching out to their high-risk students to offer help. A student's mandatory direct connects included their academic advisor and their living group coordinator. For students living in the residence halls, their residence hall coordinator was their direct connect; for students living off campus, the Deans' of Student Life were assigned a subset of off-campus students; and for those students who were residing in a fraternity or sorority, the Greek Affairs Coordinators were their direct connects. Students could also be assigned an additional direct connect advisor if they fit within one of the

following categories: TRIO program, Pilots program, K-State First-year Experience course faculty, Intercollegiate athlete or University Experience faculty. A student would have two direct connects and possibly up to several additional ones.

Within the MAP-Works™ program the direct connects recorded their interventions with their high-risk students. This information was used to determine how many of the high-risk students from 2012 and 2013 received a documented intervention. Table 4.6 indicates whether or not a high-risk student received an intervention by their direct connect.

Table 4.6. Direct connect interventions of high-risk study participants

Intervention	No Intervention	7831	99.1%
	Yes for Intervention	72	.9%

Dependent Variables

Two dependent variables were investigated in this study, fall-to-spring retention and fall-to-fall retention. Table 4.7 reports the aggregate data for the fall-to-spring **retention** rates, while Table 4.8 reports the aggregate data for the fall-to-fall **retention** rates.

Table 4.7. Frequency distribution for fall-to-spring retention

Fall-to-spring Retention	Did not return	749	9.5%
	Returned	7154	90.5%

Table 4.8. Frequency distribution for fall-to-fall retention

Fall-to-fall Retention	Did not return	1642	20.7%
	Returned	6261	79.3%

Hypothesis Testing

This section of Chapter 4 reports the results of testing hypotheses related to each research question presented in Chapter 3. Since the international students were treated differently by MAP-Works™, domestic students and international students were analyzed separately. Therefore, each research question required at least two sets of hypotheses to be tested, one set for domestic students and one set for international students. In addition, each factor was tested for correlation with the dependent variable.

For readability, this section is divided into four major components, one for each research question. Under each research question, the hypotheses tested will be stated with the associated results. For Research Question #1 and #2, analysis of each Success Marker will be reported, followed by analysis of each factor. For each research question, domestic students will be reported first, followed by international students. Table 4.9 highlights this reporting order.

Table 4.9. How the report of RQ#1 and #2 analyses are organized

Research Question			
	Domestic Students		
		Success Markers	
		Factors	
			Academic
			Behaviors & Activities
			Socio-Emotional
	International Students		
		Success Markers	
		Factors	
			Academic
			Behaviors & Activities
			Socio-Emotional

Research Question #1:

Were high-risk students who persisted to the second semester associated with different Success Marker scores (i.e. risk factors) thank those who did not persist?

From twenty factors, the MAP-Works™ survey calculated a score for each Success Marker (Financial, Academic, Behaviors & Activities, and Socio-Emotional). The Success Markers plus the combined ACT score and the spring cumulative GPA were six of the independent variables being tested. This study was interested in determining if high-risk students who persisted (that is, returned for the spring semester of their freshman year) had higher combined ACT scores, higher spring cumulative GPAs, and higher Success Marker scores than those who did not persist (that is, did not return for the spring semester of their freshman year). For the purposes of the hypotheses, "Success Marker scores" referred to the mean values from the combined ACT score, the cumulative GPA, and the four calculated values from MAP-Works™.

Domestic Students

Success markers

Hypothesis 1a: Success Marker scores for high-risk domestic students who returned for the spring semester (retention) were higher than the Success Marker scores for high-risk domestic students who did not return (one-tailed test).

Of the six Success Markers, only Cumulative GPA and Socio-Emotional were found to be significantly associated with fall-to-spring retention. An independent samples t-test was conducted to compare the Cumulative GPA for high-risk domestic students who did not return for the spring semester of their freshman year. There was a statistically significant difference in Cumulative GPA scores for students who did not

return (*M* =1.29, *SD* = 1.11, *n* = 36) and those who did return (*M* = 2.02, *SD* = .73, *n* = 563), *t*(36.95) = -3.88, *p* = .00/2=.00, one-tailed, *eta squared* = .02 (small effect size). In addition, an independent samples t-test was conducted to compare the Socio-Emotional Success Marker score for high-risk domestic students who did not return for the spring semester of their freshman year. There was a statistically significant difference in Socio-Emotional scores for students who did not return (*M* = 5.02, *SD* = .87, *n* = 36) and those who did return (*M* = 5.44, *SD* = .85, *n* = 563), *t*(597) = -2.84, *p* = .00/2=.00, one-tailed, *eta squared* = .01 (small effect size). No other Success Markers were associated with a significant difference in retention. Hypothesis 1a is supported only by Cumulative GPA and Socio-Emotional in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.10).

Academic factors

Hypothesis 1b: Academic Success Marker factor scores for high-risk domestic students who returned for the spring semester (retention) were higher than the factor scores for high-risk students who did not return (one-tail test).

Within the Academic Success Marker category, the factor Test Anxiety was the only factor out of the four (Communication, Analytical, Self-Efficacy, and Test Anxiety) that was significantly associated with retention (see Table 4.10. In addition, Test Anxiety was associated with a moderate effect size and the other three factors were associated with small effect sizes. An independent samples t-test was conducted to compare the Test Anxiety factor score for high-risk domestic students who did not return for the spring semester of their freshman year. There was a statistically significant difference in Test Anxiety factor scores for students who did not return (*M* = 3.44, *SD* = 1.61, *n* = 36)

and those who did return (M = 4.03, SD = 1.66, n = 553), $t(587) = -2.10$, p = .04/2=.02, *eta squared* = .09 (moderate effect size). Hypothesis 1b was supported only by Test Anxiety in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.10).

Table 4.10. Independent-samples t-test for Research Question #1 (retention) (high-risk, domestic) (Academic only)

Academic Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Communication	11.164	0.001	-1.330	597.000	0.184			
			-1.057	37.698	0.297	0.148	0.043	small
Analytical	0.264	0.608	0.800	596.000	0.424	0.212	0.033	small
			0.772	39.256	0.445			
Self-Efficacy	0.008	0.928	0.254	594.000	0.799	0.400	0.010	small
			0.255	39.681	0.800			
Test Anxiety	*0.053*	*0.818*	*-2.104*	*587.000*	*0.036*	*0.018*	*0.086*	moderate
			-2.160	39.994	0.037			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Behavior & activities

Hypothesis 1c: Behavior & Activities Success Marker factor scores for high-risk domestic students who returned for the spring semester (retention) were higher than the Behavior & Activities Success Marker factor scores for high-risk domestic students who did not return (one-tail test).

The Behavior & Activities Success Marker category also has four factors (Self-Discipline, Time Management, Basic Academic, and Advanced Academic). An independent samples t-test was conducted to compare each factor within the Behavior & Activities Success Marker category for fall-to-spring retention among high-risk domestic students. There was no statistically significant difference in any of the factors and each factor was associated with small effect sizes (Table 4.11). Hypothesis 1c was not supported in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.11).

Table 4.11. Independent-samples t-test for Research Question #1 (retention) (high-risk, domestic) (Behaviors & Activities only)

Behavior & Activities Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Self-Discipline	0.305	0.581	-0.517	593.000	0.605	0.302	0.021	small
			-0.500	38.043	0.620			
Time Mgmt	0.451	0.502	0.242	593.000	0.809	0.404	0.010	small
			0.235	38.085	0.816			
Basic Academic	2.721	0.100	-0.290	596.000	0.772	0.386	0.012	small
			-0.255	38.438	0.800			
Advanced Academic	0.402	0.526	-0.604	596.000	0.546	0.273	0.025	small
			-0.572	39.0580	0.571			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Socio-Emotional

Hypothesis 1d: Socio-Emotional Success Marker factor scores for high-risk domestic students who returned for the spring semester were higher than the Socio-

Emotional Success Marker factor scores for high-risk domestic students who did not return (one-tail test).

The Socio-Emotional Success Marker category includes eleven factors (Commitment, Peers, Separation, Distressed, Academic Integration, Social Integration, Satisfaction, Social On-Campus, Environment On-Campus, Roommate On-Campus, and Environment Off-Campus). An independent-samples t-test was conducted to compare each factor in the Socio-Emotional Success Marker category for fall-to-spring retention of high-risk domestic students (see Table 4.12). Peers, Homesickness: Distressed, Academic Integration, Social Integration, and Environment On-Campus were each significantly associated with retention and with moderate effect sizes. First of all, there was a significant difference in Peers factor scores for high-risk domestic students who did not return (M = 5.10, SD = 1.46, n = 36) and those who did return (M = 5.49, SD = 1.33, n = 557), $t(591) = -1.67$, p = .10/2 =.05, *eta squared* =.07 (moderate effect size). There was also a significant difference in Homesickness: Distressed factor scores for high-risk domestic students who did not return (M = 4.63, SD = 1.40, n = 36) and those who did return (M = 5.38, SD = 1.54, n = 500), $t(535) = -0.93$, p =.35/2 =.18, *eta squared* =.12 (moderate effect size). In addition, there was a significant difference in Academic Integration factor scores for high-risk domestic students who did not return (M = 5.04, SD = .99, n = 36) and those who did return (M = 5.38, SD = 1.09, n = 553), $t(587) = -1.86$, p = .06/2 =.03, *eta squared* = .08 (moderate effect size). There was also a significant difference in Social Integration factor scores for high-risk domestic students who did not return (M = 4.92, SD = 1.54, n = 36) and those who did return (M = 5.44, SD = 1.43, n = 553), $t(587) = -2.10$, p = .04/2 = .02, *eta squared* =.09 (moderate effect size).

Finally, there was a significant difference in Environment On-Campus factor scores for high-risk domestic students who did not return (M = 5.04, SD = 1.62, n = 32) and those who did return (M = 5.70, SD = 1.17, n = 486), t(33.17) = -2.30, p =.03/2 = .01, *eta squared* =.10 (moderate effect size). No other Socio-Emotional factors were significantly associated with retention of high-risk domestic students (Table 4.12).

Table 4.12. Independent-samples t-test for Research Question #1 (retention) (high-risk, domestic) (Socio-Emotional only)

Socio-Emotional Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	T	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Commitment	5.760	0.017	-1.709	596.000	0.088			
			-1.315	36.365	0.197	0.098	0.054	small
Peers	*0.003*	*0.956*	*-1.673*	*591.000*	*0.095*	*0.048*	*0.069*	moderate
			-1.539	38.836	0.132			
Separation	0.911	0.340	-0.927	535.000	0.354	0.177	0.040	small
			-1.003	41.274	0.322			
Distressed	*0.279*	*0.598*	*-2.851*	*534.000*	*0.005*	*0.002*	*0.122*	moderate
			-3.084	41.280	0.004			
Acad Integration	*1.047*	*0.307*	*-1.856*	*587.000*	*0.064*	*0.032*	*0.076*	moderate
			-2.019	40.724	0.050			
Social Integration	*0.234*	*0.628*	*-2.095*	*587.000*	*0.037*	*0.018*	*0.086*	moderate
			-1.970	39.066	0.056			
Satisfaction	0.621	0.431	-0.758	588.000	0.449	0.224	0.031	small
			-0.760	39.721	0.452			
OC Social	**0.314**	**0.575**	**-1.359**	**516.000**	**0.175**	**0.087**	**0.060**	**moderate**
			-1.262	34.538	0.215			
OC Environ	*8.323*	*0.004*	-3.045	516.000	0.002			
			-2.297	*33.171*	*0.028*	*0.014*	*0.101*	moderate
Roommate OC	5.009	0.026	-1.155	461.000	0.249			
			-0.948	32.786	0.350	0.175	0.044	small
Environ OffC	**1.658**	**0.202**	**1.283**	**68.000**	**0.204**	**0.102**	**0.154**	**large**
			2.387	4.728	0.066			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

On the other hand, two factors that were not significantly associated with retention of high-risk domestic students were found to have unusual effect sizes. An independent-samples t-test for Social On-Campus factor scores revealed no significant difference for high-risk domestic students who did not return (M = 4.78, SD = 1.69, n = 32) and those who did return (M = 5.17, SD = 1.55, n = 486), $t(516) = -1.36$, p = .18/2 = .09, *eta squared* = .06 (moderate effect size). Even though Social On-Campus was not a statistically significant predictor of retention, its effect on retention was not small, but instead was moderate, for high-risk domestic students.

In addition, an independent samples t-test for Environment Off-Campus factor scores revealed no significant difference for high-risk domestic students who did not return (M = 6.50, SD = .58, n = 4) and those who did return (M = 5.73, SD = 1.19, n = 66), $t(68) = 1.28$, p = 0.20/0.10, *eta squared* = 0.15 (large effect size). In addition to the large effect size, Environment Off-Campus factor scores changed in the opposite direction; that is, those high-risk domestic students who did not return reported higher mean scores than those who returned. Note, however, that the frequency of high-risk domestic students who reported on the environment off-campus was limited to four.

Hypothesis 1d was supported in predicting the retention of high-risk domestic students from fall-to-spring semester for Socio-Emotional factors Peers, Homesickness: Distressed, Academic Integration, Social Integration, and Environment On-Campus (see Table 4.13).

Table 4.13. Summary of independent-samples t-test for Research Question #1 (retention) (high-risk, domestic)

Success Markers and Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	Eta squared	Cohen[2]
ACT Composite (n.s.)			-0.728	597	0.467	0.234	0.001	Small
Cumulative GPA	14.439	0.000	-3.877	36.949	0.000	0.000	0.025	Small
Financial (n.s.)			-0.853	597	0.394	0.197	0.001	Small
ACADEMIC (n.s.)			-1.140	597	0.255	0.128	0.002	Small
Test Anxiety			-2.104	587	0.036	0.018	0.086	Moderate
BEHAVIORS & ACTIVITIES			-0.239	597	0.811	0.406	0.000	Small
SOCIO-EMOTIONAL			-2.861	597	0.004	0.002	0.014	Small
Peers			-1.673	591	0.095	0.048	0.069	Moderate
Homesickness: Distressed			-2.851	534	0.005	0.002	0.122	Moderate
Academic Integration			-1.856	587	0.064	0.032	0.076	Moderate
Social Integration			-2.095	587	0.037	0.018	0.086	Moderate
Environment On-Campus			-2.297	33.1710	0.028	0.014	0.101	Moderate
Social On-Campus (n.s.)			-1.359	516	0.175	0.088	0.060	Moderate
Environment Off-Campus (opposite) (n.s.)			1.283	68	0.204	0.102	0.154	Large

[1]if the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

International Students

Success markers

Hypothesis 1e: Success Marker scores for high-risk international students who returned for the spring semester (retention) were higher than the Success Marker scores for high-risk international students who did not return (one-tailed test).

Of the five Success Markers for international students (MAP-Works™ does not collect a combined ACT score for international students), only cumulative GPA was found to be significantly associated with fall-to-spring retention. An independent-samples t-test was conducted to compare the Cumulative GPA score for high-risk international students who did not return for the spring semester (retention) of their freshman year. There was a statistically significant difference in Cumulative GPA scores for students who did not return (M =.85, SD = .11, n = 2) and those who did return (M = 3.02, SD = .87, n = 74), $t(74) = -3.50$, p = .00/2 = .00, *eta squared* = .02 (small effect size). No other Success Markers were associated with a significant difference in retention. Hypothesis 1e is supported only by Cumulative GPA in predicting the retention of high-risk international students from fall-to-spring semester (see Table 4.17).

Academic factors

Hypothesis 1f: Academic Success Marker factor scores for high-risk international students who returned for the spring semester (retention) were higher than the factor scores for high-risk students who did not return (one-tail test).

Within the Academic Success Marker category, the factor Self-Efficacy was the only factor out of the four (Communication, Analytical, Self-Efficacy, Test Anxiety) that was significantly associated with retention (Table 4.14). In addition, Self-Efficacy and

Communication both were associated with a large effect size and the remaining two of factors were associated with small effect sizes. Another interesting note of the association of Academic Success Marker factor scores with retention for high-risk international students is that each factor score mean difference was in the opposite direction from expected. That is, for each factor, those who did not return for the spring semester had lower scores than those who did return indicating that those who did not return were at lower risk than those who did return. A possible explanation for this moving in the opposite direction, which indicates that international students who were at lower risk left the university is their dissatisfaction with the requirement to extend their time within the English Language Program (ELP).

Self-Efficacy was the only Academic factor that was significantly associated with retention for high-risk international students. An independent-samples t-test was conducted to compare the Self-Efficacy factor score for high-risk international students who did not return for the spring semester of their freshman year. There was a statistically significant difference in Self-Efficacy factor scores for high-risk international students who did not return (M = 4.00, SD = .000, n = 2) and those who did return (M = 5.05, SD = 1.21, n = 73), $t(72.00) = -7.46$, p = .00/2 = .00, *eta squared* = .66 (large effect size), but it is in the opposite direction expected. Hypothesis 1f is supported only by Self-Efficacy (in the opposite direction) in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.14).

Table 4.14. Independent-samples t-test for Research Question #1 (retention) (high-risk, international) (Academic only)

Academic factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Communication	**0.543**	**0.463**	**1.342**	**74.000**	**0.184**	**0.092**	**0.154**	**Large**
			1.881	1.113	0.291			
Analytical	3.340	0.072	0.246	74.000	0.807	0.404	0.029	Small
			1.504	73.000	0.137			
Self-Efficacy	*4.928*	*0.030*	-1.226	73.000	0.224			
			-7.459	*72.000*	*0.000*	*0.000*	*0.658*	large
Anxiety	0.827	0.366	-0.008	72.000	0.993	0.496	0.001	small
			-0.013	1.155	0.991			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Communication factor scores, while not significant, were associated with a large effect size. There was no statistically significant difference in Communication factor scores for students who did not return ($M = 5.50$, $SD = .71$, $n = 2$) and those who did return ($M = 4.53$, $SD = 1.01$, $n = 74$). In addition, the difference in mean scores was in the opposite direction than expected; that is, high-risk international students who did not return had higher Communication factor scores than those who did return. Like other results for international students, these effect sizes may have been a result of the small number of valid students remaining after outliers were removed. Another potential cause of communication factor mean scores moving in the wrong direction for the high-risk international students who did not persist may be a function of frustration at being asked

to stay another semester in the ELP. They might have left for another university where they would be able to start their major studies course work.

Behaviors & Activities

Hypothesis 1g: Behaviors & Activities Success Marker factor scores for high-risk international students who returned for the spring semester (retention) were higher than the factor scores for high-risk students who did not return (one-tail test).

Within the Behaviors & Activities Success Marker category, there are four factors (Self-Discipline, Time Management, Basic Academic, and Advanced Academic). An independent samples t-test was conducted to compare each factor within the Behavior & Activities Success Marker category for fall-to-spring retention among high-risk international students. There was a statistically significant difference in Self-Discipline factor scores for high-risk international students who did not return ($M = 6.33$, $SD = .471$, $n = 2$) and those who did return ($M = 5.09$, $SD = .958$, $n = 73$), $t(73.00) = 1.81$, $p = .07/2 = .04$, *eta squared* = .21 (large effect size) (Table 4.15). In addition, the difference in mean scores was in the opposite direction than expected; that is, high-risk international students who did not return had higher Self-Discipline factor scores than those who did return. Like other results for international students, these effect sizes may have been a result of the small number of valid students remaining after outliers were removed. Hypothesis 1f is supported only by Self-Discipline (in the opposite direction) in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.15).

Table 4.15. Independent-samples t-test for Research Question #1 (retention) (high-risk, international) (Behaviors & Activates only)

Behaviors & Activities Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Self-Discipline	*2.297*	*0.134*	*1.811*	*73.000*	*0.074*	*0.037*	*0.207*	large
			3.519	1.2390	0.137			
Time Mgmt	1.381	0.244	0.253	73.000	0.801	0.400	0.030	small
			0.455	1.200	0.718			
Basic Academic	**1.035**	**0.312**	**-0.710**	**74.000**	**0.480**	**0.240**	**0.082**	**moderate**
			-0.418	1.018	0.747			
Advanced Academic	**0.038**	**0.845**	**-0.726**	**74.000**	**0.470**	**0.235**	**0.084**	**moderate**
			-0.686	1.049	0.613			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

However, Basic Academic and Advanced Academic factor scores were associated with moderate effect sizes (Table 4.15). The mean Basic Academic factor score showed no differences for those who did not return (M = 5.70, SD = 1.02, n = 14) and those who did return (M = 5.68, SD = .987, n = 62), but the trend indicated that those who did not return had higher Basic Academic factor scores than those who did return. The mean Advanced Academic factor score differences for those who did not return (M = 5.33, SD

= 1.22, n = 14) and those who did return (M = 5.23, SD = .949, n = 62) were also not significant, however, this data does indicate that those who did not return had higher Advanced Academic factor scores than those who did return. As with other results for international students, these effect sizes may have been a result of the small number of valid students remaining after outliers were removed or the result of students transferring to another university where they could more quickly enroll in their course of study without ELP.

Socio-Emotional

Hypothesis 1h: Socio-Emotional Success Marker factor scores for high-risk international students who returned for the spring semester (retention) were higher than the factor scores for high-risk students who did not return (one-tail test).

Within the Socio-Emotional Success Marker category, ten factors (Commitment, Peers, Separation, Distressed, Academic Integration, Satisfaction, Social On-Campus, Environment On-Campus and Roommate On-Campus) were included in this category. An independent samples t-test was conducted to compare each factor within the Socio-Emotional Marker category for fall-to-spring retention among high-risk international students. There was no statistically significant difference in any of the factors (see Table 4.16). Hypothesis 1h was not supported in predicting the retention of high-risk international students from fall-to-spring semester (see Table 4.16).

Table 4.16. Independent-samples for Research Question #1 (retention) (high-risk, international) (Behaviors & Activities only)

Socio-Emotional Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Commitment	**0.001**	**0.978**	**0.536**	**68.000**	**0.594**	**0.297**	**0.065**	**moderate**
			0.510	1.054	0.696			
Peers	0.048	0.828	0.029	73.000	0.977	0.488	0.003	small
			0.023	1.032	0.985			
Separation	**0.996**	**0.322**	**-0.794**	**66.000**	**0.430**	**0.215**	**0.097**	**moderate**
			-1.563	1.277	0.321			
Distressed	1.160	0.286	-0.304	65.000	0.762	0.381	0.038	small
			-0.491	1.179	0.699			
Acad Integration	0.192	0.662	-0.375	71.000	0.709	0.354	0.044	small
			-0.265	1.027	0.834			
Social Integration	0.326	0.570	0.110	71.000	0.912	0.456	0.013	small
			0.075	1.025	0.952			
Satisfaction	**0.287**	**0.594**	**0.529**	**71.000**	**0.599**	**0.300**	**0.063**	**moderate**
			0.362	1.026	0.778			
OC Social	0.002	0.969	0.246	65.000	0.807	0.404	0.030	small
			0.203	1.042	0.871			
OC Environ	0.012	0.913	-0.316	65.000	0.753	0.376	0.039	small
			-0.244	1.036	0.847			
Roommate OC	**0.005**	**0.945**	**-0.599**	**55.000**	**0.552**	**0.276**	**0.080**	**moderate**
			-0.512	1.053	0.696			

However, even though not significant, Commitment, Homesickness: Separation, Satisfaction, and Roommate On-Campus factor scores were each associated with

moderate effect sizes. An independent samples t-test was conducted to compare each factor for fall-to-spring retention among high-risk international students. In addition, the difference in mean scores was in the opposite direction than expected for Commitment and Satisfaction. An independent-samples t-test for Commitment factor scores indicated a higher mean score for those who did not return (M = 5.00, SD = 1.41, n = 2) compared to those who did return (M = 4.48, SD = 1.34, n = 68). The independent-samples t-test for Satisfaction also indicated a higher mean score for those who did not return (M = 5.16, SD = 1.65, n = 2) compared to those who did return (M = 4.74, SD = 1.11, n = 71). Note that there were only two students who did not return in the sample of high-risk international students. These two students had higher Commitment and higher Satisfaction factor scores than those who returned.

An independent-samples t-test for Homesickness: Separation compared the mean score for those who did not return (M = 3.50, SD = .71, n = 2) to those who did return (M = 4.33, SD = 1.46, n = 66). An independent-samples t-test for Roommate On-Campus compared the mean score for those who did not return (M = 5.00, SD = 1.41, n = 2) to those who did return (M = 5.52, SD = 1.20, n = 55). In both cases, high-risk international students who did not return (n = 2) had lower scores on Homesickness: Separation and Roommate On-Campus than those who did not return.

As with other results for international students, these effect sizes may have been a result of the small number of valid students remaining after outliers were removed. Possibly Homesickness: Separation with its moderate effect size could be explained as occurring because international students are far from their home, families, and others from their close support system.

Table 4.17. Summary of independent-samples t-test for Research Question #1 (retention) (high-risk, international)

Success Markers and Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	Eta squared	Cohen[2]
Cumulative GPA			-3.497	74	0.001	0.000	0.020	Small
Financial (n.s.)			0.735	74	0.465	0.232	0.001	Small
ACADEMIC (n.s.)			0.038	74	0.970	0.485	0.000	Small
Self-Efficacy (suspicious)			-7.459	72	0.000	0.000	0.658	Large
BEHAVIORS & ACTIVITIES (n.s.)			0.161	74	0.872	0.436	0.000	Small
Self-Discipline (opposite)			1.811	73	0.074	0.037	0.207	Large
Basic Academic (n.s.)			-0.710	74	0.480	0.240	0.082	Moderate
Advanced Academic (n.s.)			-0.726	74	0.470	0.235	0.084	Moderate
SOCIO-EMOTIONAL (n.s.)[3]			-0.161	74	0.873	0.436	0.000	Small
Commitment (opposite) (n.s.)			0.536	68	0.594	0.297	0.650	Moderate
Homesickness: Separation (n.s.)			-0.794	66	0.430	0.215	0.097	Moderate
Satisfaction (opposite) (n.s.)			0.529	71	0.599	0.300	0.063	Moderate
On-Campus Living, Roommate (n.s.)			-0.599	55	0.552	0.276	0.080	Moderate

[1]if the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

[3]Factor 19 (Off-Campus Living, Environment) was excluded from analysis because some cells were empty

Summary of Research Question #1

The analysis of high-risk domestic students showed that cumulative GPA and Socio-Emotional Success Markers were found to be significantly associated with fall-to-spring retention. In addition, Test Anxiety, Peers, Homesickness: Distressed, Academic Integration, Social Integration, and Environment On-Campus factor scores were significantly associated with retention from fall-to-spring for high-risk domestic students. These six factors were also associated with moderate effect sizes.

The analysis of high-risk international students indicated that cumulative GPA was found to be significantly associated with fall-to-spring retention. Self-Efficacy and Self-Discipline were also found to be significant for retention, but the mean differences were in the opposite direction from expected. That is, high-risk international students who did not return had higher factors scores for self-efficacy and self-discipline than those who returned for the spring semester of their freshman year. These results could be the result of the small sample size for international students who did not return.

Research Question #2

Were high-risk students who were retained to the second year associated with different success marker scores (i.e., risk factors) than those who were not retained?

From twenty factors, the MAP-Works^{TM} survey calculates a score for each Success Marker (Financial, Academic, Behaviors & Activities, and Socio-Emotional). The Success Markers plus the combined ACT score and the spring cumulative GPA are six of the independent variables being tested. This information would help to understand if high-risk students who were retained (that is, returned for the fall semester of their second year) had higher combined ACT composite scores, higher first-year cumulative

GPAs, and higher Success Marker scores than those who were not retained (that is, did not return for the fall semester of their second year). For the purposes of the hypotheses, "Success Marker scores" will mean the values from the combined ACT composite score, the cumulative GPA, and the four calculated Success Maker values from MAP-Works™.

Domestic Students

Success markers

Hypothesis 2a: Success Marker scores for high-risk domestic students who returned for the fall semester of their second year (retention) were higher than the Success Marker scores for high-risk domestic students who did not return (one-tailed test).

Of the six Success Markers, cumulative GPA and Socio-Emotional were found to be significantly associated with fall-to-fall retention. An independent samples t-test was conducted to compare the Cumulative GPA score for high-risk domestic students who did not return for the second year (retention). There was a statistically significant difference in Cumulative GPAs for students who did not return (M =1.56, SD = .80, n = 247) and those who did return (M = 2.26, SD = .61, n = 354), $t(436) = -11.54$, p = .00/2 = .00, one-tailed, *eta squared* = .18 (large effect size). In addition, an independent samples t-test was conducted to compare the Socio-Emotional Success Marker score for high-risk domestic students who did not return for the second year. There was a statistically significant difference in Socio-Emotional scores for students who did not return (M = 5.34, SD = .85, n = 247) and those who did return (M = 5.46, SD = .86, n = 354), $t(597) = -1.80$, p = .07/2 = .04/1, one-tailed, *eta squared* = .01 (small effect size). No other Success Markers were associated with a significant difference in retention. Hypothesis

2a is supported only by Cumulative GPA and Socio-Emotional in predicting the retention of high-risk domestic students from fall-to-fall of their second year (see Table 4.21).

Factors

Academic

Hypothesis 2b: Academic Success Marker factor scores for high-risk domestic students who returned for the fall semester of their second year (retention) were higher than the factor scores for high-risk domestic students who did not return (one-tail test).

Within the Academic Success Marker category, the factors Communication and Analytical were the two factors out of the four (Communication, Analytical, Self-Efficacy, and Test Anxiety) that were significantly associated with retention (see Table 4.18). An independent-samples t-test was conducted to compare Communication factor scores for high-risk domestic students who did not return for the fall semester of their second year. There was a statistically significant difference in Communication factor scores for students who did not return (M = 5.05, SD = 1.07, n = 247) and those who did return (M = 5.20, SD = 1.09, n = 352), $t(597) = -1.64$, $p = .10/2 = .05/1$, *eta squared* = .07 (moderate effect size). In addition, an independent-samples t-test was conducted to compare Analytical factor scores for high-risk domestic students who did not return for the fall semester of their second year. There was a statistically significant difference in Analytical factor scores for students who did not return (M = 5.21, SD = 1.10, n = 246) and those who did return (M = 5.00, SD = 1.19, n = 352), $t(596) = 2.25$, $p = .02/2 = .01/1$, *eta squared* = .09 (moderate effect size). However, the direction of the mean difference in Analytical factor scores was in the opposite direction than expected; that is, those who did not return for the fall semester of their second year had higher Analytical factor scores than those who did. Hypothesis 2b was supported by Communication and

Analytical (in the opposite direction) in predicting the retention of high-risk domestic students from fall-to-fall of the second year (see Table 4.21)

Table 4.18. Independent-samples t-test for Research Question #2 (retention) (high-risk, domestic) (Academic only)

Academic Factors	Levene's Test for Equality of Variances		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Communication	*0.082*	*0.774*	*-1.644*	*597.000*	*0.101*	*0.050*	*0.067*	moderate
			-1.649	535.177	0.100			
Analytical	*0.520*	*0.471*	*2.248*	*596.000*	*0.025*	*0.012*	*0.092*	moderate
			2.280	552.305	0.023			
Self-Efficacy	5.159	0.023	-0.683	594.000	0.495			
			-0.696	555.278	0.487	0.244	0.028	small
Anxiety	3.775	0.053	-0.222	587.000	0.824	0.412	0.009	small
			-0.220	504.105	0.826			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Behavior & Activities

Hypothesis 2c: Behavior & Activities Success Marker factor scores for high-risk domestic students who returned for the fall semester of their second year (retention) were higher than the Behavior & Activities Success Marker factor scores for high-risk domestic students who did not return (one-tail test).

The Behavior & Activities Success Marker category has four factors (Self-Discipline, Time Management, Basic Academic, and Advanced Academic). An independent samples t-test was conducted to compare each factor within the Behavior & Activities Success Marker category for fall-to-fall second year retention among high-risk

domestic students. There was no statistically significant difference in any of the factors (Table 4.19). Hypothesis 2c was not supported in predicting the retention of high-risk domestic students from fall-to-spring semester (see Table 4.21).

Table 4.19. Independent-samples t-test for Research Question #2 (retention) (high-risk, domestic) (Behavior & Activities only)

Behavior & Activities Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Self-Discipline	0.014	0.905	-1.156	593.000	0.248	0.124	0.047	small
			-1.158	528.201	0.248			
Time Mgmt	0.816	0.367	-1.132	593.000	0.258	0.129	0.046	small
			-1.135	526.848	0.257			
Basic Academic	0.040	0.841	-1.101	596.000	0.271	0.136	0.045	small
			-1.098	522.358	0.273			
Advanced Academic	0.532	0.466	-1.489	596.000	0.137	0.068	0.061	moderate
			-1.498	538.503	0.135			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Even though Advanced Academic was not a significant factor in predicting retention for high-risk domestic students, the effect size was moderate. An independent-samples t-test compared the mean scores for those who did not return ($M = 4.88$, $SD = 1.0$, $n = 246$) to those who did return ($M = 5.02$, $SD = 1.11$, $n = 352$). In other words,

high-risk domestic students who did not return had lower Advanced Academic scores than those who returned. Further investigation is needed to explain this moderate effect that is opposite than what would be expected where higher risk students with higher Advanced Academic scores left the university.

Socio-Emotional

Hypothesis 2d: Socio-Emotional Success Marker factor scores for high-risk domestic students who returned for the fall semester of their second year (retention) were higher than the Socio-Emotional Success Marker factor scores for high-risk domestic students who did not return (one-tail test).

The Socio-Emotional Success Marker category includes eleven factors (Commitment, Peers, Separation, Distressed, Academic Integration, Social Integration, Satisfaction, Social On-Campus, Environment On-Campus, Roommate On-Campus, and Environment Off-Campus). An independent-samples t-test was conducted to compare each factor in the Socio-Emotional Success Marker category for fall-to-fall retention of high-risk domestic students. Social Integration and Social On-Campus were each significantly associated with retention and with moderate effect sizes (Table 4.20). First, there was a significant difference in Social Integration factor scores for high-risk domestic students who did not return (M = 5.24, SD = 1.52, n = 244) and those who did return (M = 5.53, SD = 1.38, n = 345), $t(587) = -2.45$, p = .01/2 = .01, *eta squared* =.11 (moderate effect size). Second, there was a significant difference in On-Campus Living, Social factor scores for high-risk domestic students who did not return (M = 5.00, SD = 1.64, n = 207) and those who did return (M = 5.26, SD = 1.50, n = 311), $t(516) = -1.97$, p =.05/2 = .02/1, *eta squared* =.09 (moderate effect). Hypothesis 2d was supported by

Social Integration and Social On-Campus (see Table 4.21) for predicting fall-to-fall retention among high-risk domestic students.

Table 4.20. Independent-samples t-test for Research Question #2 (retention) (high-risk, domestic) (Socio-Emotional only)

Socio-Emotional Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Commitment	1.524	0.218	0.190	596.000	0.849	0.424	0.008	small
			0.192	550.299	0.847			
Peers	4.525	0.034	-1.365	591.000	0.173			
			-1.325	466.574	0.186	0.093	0.054	small
Separation	0.394	0.530	-0.270	535.000	0.787	0.394	0.012	small
			-0.270	478.720	0.788			
Distressed	0.009	0.926	-1.142	534.000	0.254	0.127	0.049	small
			-1.140	477.353	0.255			
Acad Integration	1.877	0.171	-1.185	587.000	0.236	0.118	0.049	small
			-1.194	536.651	0.233			
Social Integration	*3.345*	*0.068*	*-2.454*	*587.000*	*0.014*	*0.007*	*0.101*	*moderate*
			-2.412	489.596	0.016			
Satisfaction	1.655	0.199	-0.133	588.000	0.894	0.447	0.006	small
			-0.134	533.972	0.893			
OC Social	*2.629*	*0.106*	*-1.974*	*516.000*	*0.049*	*0.024*	*0.087*	*moderate*
			-1.938	413.530	0.053			
OC Environ	0.074	0.785	-0.532	516.000	0.595	0.298	0.023	small
			-0.529	435.073	0.597			
Roommate OC	0.411	0.522	-0.249	461.000	0.803	0.402	0.012	small
			-0.249	407.095	0.803			
Environ OffC	**0.050**	**0.824**	**-1.156**	**68.000**	**0.252**	**0.126**	**0.139**	**large**
			-1.156	67.410	0.252			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

However, although Off-Campus Living, Environment was not a significant factor in predicting fall-to-fall retention for high-risk domestic students, this factor was

associated with a large effect size. An independent-samples t-test was conducted to compare those who did not return (M = 5.61, SD = 1.12, n = 35) to those who did return (M = 5.93, SD = 1.22, n = 35). In other words, high-risk domestic students who returned had higher scores in Off-Campus Living, Environment than those who did not return, which indicates that returning students were less at risk. The large effect size may be accounted for by off campus students struggling with support living off campus. Note that the small number of students in this dataset living off-campus (n = 70) might be skewing the effect size (Table 4.21).

Table 4.21. Summary of independent-samples t-test for Research Question #2 (retention) (high-risk, domestic)

Success Markers and Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	Eta squared	Cohen[2]
ACT Composite (opposite) (n.s.)			0.296	597	0.768	0.384	0.000	Small
Cumulative GPA	16.698	0.000	-11.549	436.768	0.000	0.000	0.183	Large
Financial (n.s.)			-1.057	597	0.291	0.146	0.002	Small
ACADEMIC (n.s.)			-0.234	597	0.815	0.408	0.000	Small
Communication			-1.644	597	0.101	0.050	0.067	Moderate
Analytical (opposite)			2.248	596	0.025	0.013	0.092	Moderate
BEHAVIORS & ACTIVITIES (n.s.)			-1.525	597	0.127	0.064	0.004	Small
Advanced Academic (n.s.)			-1.489	596	0.137	0.068	0.061	Moderate
SOCIO-EMOTIONAL								
Social Integration			-1.801	597	0.072	0.036	0.005	Small
On-Campus Living, Social			-2.454	587	0.014	0.007	0.101	Moderate
			-1.974	516	0.049	0.024	0.087	Moderate
Off-Campus Living, Environment (n.s.)			-1.156	68	0.252	0.126	0.139	Large

[1]if the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

International Students

Success markers

Hypothesis 2e: Success Marker scores for high-risk international students who returned for the fall semester of their second year (retention) were higher than the Success Marker scores for high-risk international students who did not return (one-tailed test).

Of the five Success Markers for high-risk international students, (MAP-Works™ does not collect a combined ACT score for international students), none of them were significantly associated with retention to the fall semester of the second year. In fact, the mean differences of three of the five Success Markers (Academic, Behaviors & Activities, and Socio-Emotional) were in the opposite direction from what was expected. No Success Markers were associated with a significant difference in retention. The opposite direction for three of the five success markers is difficult to explain. The small number of international students in this study could have been a contributing factor to non-significance. Keeping international students in the ELP for more than one year may also contribute to non-significance. Hypothesis 2e is not supported in predicting the fall-to-fall retention of high-risk international students (see Table 4.25).

Factors

Academic

Hypothesis 2f: Academic Success Marker factor scores for high-risk international students who returned for the fall semester of their second year (retention) were higher than the factor scores for high-risk students who did not return (one-tail test).

Within the Academic Success Marker category, none of the factors were significantly associated with retention (see Table 4.22). Hypothesis 1f was not supported for predicting fall-to-fall retention of high-risk international students (see Table 4.25).

Table 4.22. Independent-samples t-tests for Research Question #2 (retention) (high-risk, international) (Academic only)

Academic factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Communication	**4.529**	**0.037**	0.928	74.000	0.356			
			0.711	**15.567**	**0.488**	**0.244**	**0.082**	**moderate**
Analytical	**3.813**	**0.055**	**-1.537**	**74.000**	**0.129**	**0.064**	**0.176**	**large**
			-1.193	15.696	0.251			
Self-Efficacy	4.579	0.036	-0.582	73.000	0.563			
			-0.471	16.159	0.644	0.322	0.055	small
Anxiety	**0.036**	**0.850**	**0.814**	**72.000**	**0.418**	**0.209**	**0.096**	**moderate**
			0.782	18.729	0.444			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

However, three factors, Analytical, Communication and Test Anxiety were associated with unusual effect sizes. For two of these factors, Communication and Test Anxiety, were in the opposite direction. While Analytical was not a significant factor in predicting retention, the effect size was large. An independent-samples t-test was conducted to compare those who did not return ($M = 4.46$, $SD = 1.34$, $n = 14$) to those who did return ($M = 4.91$, $SD = .89$, $n = 62$). In other words, those who did not return for their second year had lower Analytical factor scores than those who did.

Although Communication was not significant in predicting fall-to-fall retention for high-risk international students, the effect size was moderate and in the opposite direction. An independent-samples t-test was conducted to compare those who did not return ($M = 4.78$, $SD = 1.40$, n = 14) and those who did return ($M = 4.51$, $SD = .91$, $n = 62$). High-risk international students with higher Communication factor scores did not return for the fall semester of their second year. A possible explanation for this opposite direction for communication scores could be because the ELP program has a reputation for keeping students for additional semesters in its program when the students believe that they are ready to be admitted into their program of study.

Test Anxiety was not a significant factor in predicting retention, but the effect size was moderate and in the opposite direction. An independent-samples t-test was conducted to compare those who did not return ($M = 4.98$, $SD = 1.61$, $n = 14$) and those who did return ($M = 4.60$, $SD = 1.52$, $n = 60$). In other words, students who did not return had higher Test Anxiety scores indicating that they were less at risk for anxiety related to taking tests (higher factor scores = lower risk). The small size in this sample may be confounding the findings, but having an opposite direction in Communication and Test Anxiety may be an indication of an international student's preparedness to move into their major study courses as opposed to continuing in the ELP.

Behaviors & Activities

Hypothesis 2g: Behaviors & Activities Success Marker factor scores for high-risk international students who returned for the fall semester of their sophomore year were higher than the factor scores for high-risk students who did not return (one-tail test).

None of the factors within the Behaviors & Activities Success Marker category were significantly associated with predicting retention of high-risk international students to the fall semester of their second year (Table 4.23). In fact, every mean difference was in the opposite direction from expected. Hypothesis 1g was not supported for high-risk international students (Table 4.25).

Table 4.23. Independent-samples t-tests for Research Question #2 (retention) (high-risk, international) (Behaviors & Activities only)

Behaviors & Activities factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Self-Discipline	**1.505**	**0.224**	**0.978**	**73.000**	**0.331**	**0.166**	**0.114**	**large**
			0.885	17.614	0.388			
Time Mgmt	0.844	0.361	0.482	73.000	0.631	0.316	0.056	small
			0.425	17.215	0.676			
Basic Academic	0.033	0.856	0.038	74.000	0.969	0.484	0.004	small
			0.038	18.879	0.970			
Advanced Academic	0.805	0.373	0.317	74.000	0.752	0.376	0.037	small
			0.269	16.6900	0.791			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

The effect size for Self-Discipline on fall-to-fall retention of high-risk international students was large (see HTable 4.23) even though Self-Discipline was not significantly associated with retention of high-risk international students. An independent-samples t-test was conducted to compare those who did not return (M = 5.36, SD = 1.10, n = 14) and those who did return (M = 5.08, SD = .94, n = 61). In other

words, high-risk international students who did not return scored higher on Self-Discipline than those who returned.

Socio-Emotional

Hypothesis 2h: Socio-Emotional Success Marker factor scores for high-risk international students who returned for the fall semester of their second year (retention) were higher than the factor scores for high-risk international students who did not return (one-tail test).

Within the Socio-Emotional Success Marker category, Commitment and Homesickness: Distressed were significantly associated with retention of high-risk international students to the fall of their second year (Table 4.24). Both factors were associated with large effect sizes, and both factors were in the opposite direction from expected. An independent-samples t-test was conducted to compare Commitment factor scores for high-risk international students who did not return for the second year (retention). There was a statistically significant difference in Commitment factor scores for students who did not return ($M = 5.13$, $SD = 1.66$, $n = 13$) and for those who returned ($M = 4.35$, $SD = 1.22$, $n = 57$), $t(68) = 1.92$, $p = .06/2 = .03/1$, *eta squared* =.23 (large effect size). In other words, high-risk international students who did not return were associated with higher Commitment factor scores than those who returned for the fall semester of their second year. These results could be the result of the small sample size for international students who did not return.

An independent-samples t-test was conducted to compare Homesickness: Distressed factor scores for high-risk international students who did not return for the second year (Retention). There was a statistically significant difference in

Homesickness: Distressed factor scores for students who did not return (M = 5.59, SD = 1.29, n = 12) and those who did return (M = 4.79, SD = 1.46, n = 55), t(65) = 1.74, p = .09/2 = .04, eta squared = 0.21 (large effect size). In other words, high-risk international students who did not return were associated with higher Homesickness: Distressed factor scores than for those who returned for the fall semester of their second year. These results could be influenced by the small sample size for international students who did not return. In summary, Hypothesis 2h was supported by Commitment and Homesickness: Distressed, each in the opposite direction, for predicting fall-to-fall retention of high-risk international students (see Table 4.25).

Table 4.24. Independent-samples t-tests for Research Question #2 (retention) (high-risk, international) (Socio-Emotional only)

Socio-Emotional Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	eta squared	Cohen[2]
Commitment	*3.604*	*0.062*	*1.920*	*68.000*	*0.059*	*0.030*	*0.227*	*large*
			1.583	15.095	0.134			
Peers	**0.162**	**0.688**	**0.632**	**73.000**	**0.530**	**0.265**	**0.074**	**moderate**
			0.625	19.204	0.539			
Separation	0.383	0.538	0.070	66.000	0.944	0.472	0.009	small
			0.065	15.020	0.949			
Distressed	*0.470*	*0.495*	*1.744*	*65.000*	*0.086*	*0.043*	*0.211*	*large*
			1.897	17.807	0.074			
Acad Integration	1.431	0.236	0.462	71.000	0.645	0.322	0.055	small
			0.503	21.917	0.620			
Social Integration	**6.762**	**0.011**	-0.411	71.000	0.682			
			-0.526	**28.915**	**0.603**	**0.302**	**0.062**	**moderate**
Satisfaction	**1.626**	**0.206**	**1.236**	**71.000**	**0.221**	**0.110**	**0.145**	**large**
			1.125	17.841	0.275			
OC Social	**0.002**	**0.963**	**-1.187**	**65.000**	**0.239**	**0.120**	**0.146**	**large**
			-1.176	14.089	0.259			
OC Environ	**0.014**	**0.905**	**-0.597**	**65.000**	**0.553**	**0.276**	**0.074**	**moderate**
			-0.588	14.017	0.566			
Roommate OC	0.210	0.649	-0.369	55.000	0.713	0.356	0.050	small
			-0.378	9.614	0.713			

[1]If the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

For four of the Socio-Emotional Success Marker factors (Social Integration, On-Campus Living, On-Campus Living, Social, Environment) that were non-significant, the effect sizes were unusual (see Table 4.25). An independent-samples t-test was conducted to compare Social Integration factor scores for those who did not return ($M = 4.83$, $SD = .66$, $n = 14$) and those who did return ($M = 4.95$, $SD = 1.00$, $n = 59$); the effect size was moderate. In addition, an independent-samples t-test was conducted to compare On-

Campus Living, Social factor scores for those who did not return (M = 4.42, SD = 1.16, n = 11) and those who did return (M = 4.88, SD = 1.15, n = 56); the effect size was large. Finally, an independent-samples t-test was conducted to compare On-Campus Living, Environment factor scores for those who did not return (M = 5.06, SD = 1.10, n = 11) and those who did return (M = 5.27, SD = 1.08, n = 56); the effect size was moderate (Table 4.24). For these three factors that had a moderate or large effect size, but were not statistically significantly associated with fall-to-fall retention to the second year, the assumption could be made that each of these factors were important in retaining international students because of fitting in and feeling supported on-campus.

For two of the Socio-Emotional Success Marker factors (Peers and Satisfaction) that were non-significant, the mean differences were in the opposite direction, and the effect sizes were either moderate or large. An independent-samples t-test was conducted to compare Peers factor scores for those who did not return (M = 5.14, SD = 1.10, n = 14) and those who did return (M = 4.94, SD = 1.08, n = 61); the effect size was moderate. An independent-samples t-test was conducted to compare Satisfaction factor scores for those who did not return (M = 5.08, SD = 1.25, n = 14) and those who did return (M = 4.68, SD = 1.08, n = 59); the effect size was large (Table 4.24). In other words high-risk international students who did not return for the fall semester of their second year were associated with higher Peers factor scores and higher Satisfaction factor scores than those who did return. These unexpected results could be a function of the smaller group sizes or factors that are not being measured by the MAP-Works™ survey.

Table 4.25. Summary of independent-samples t-test for Research Question #2 (retention) (high-risk, international)

Success Markers and Factors	Levene's Test for Equality of Variances[1]		t-test for Equality of Means				Effect Size	
	F	Sig.	t	df	Sig. (2-tailed)	Sig. (1-tailed)	Eta squared	Cohen[2]
Cumulative GPA (n.s.)	32.795	0.000	-1.125	14.503	0.232	0.116	0.003	Small
Financial (n.s.)			-1.449	74.000	0.152	0.076	0.004	Small
ACADEMIC (opposite) (n.s.)	13.731	0.000	0.003	14.781	0.998	0.499	0.000	Small
Communication (opposite) (n.s.)	4.529	0.037	0.711	15.567	0.488	0.244	0.082	Moderate
Test Anxiety (opposite) (n.s.)			0.814	72.000	0.418	0.209	0.096	Moderate
Analytical (n.s.)			-1.537	74.000	0.129	0.064	0.176	Large
BEHAVIORS & ACTIVITIES (opposite) (n.s.)			0.526	74.000	0.600	0.300	0.000	Small
Self-Discipline (opposite) (n.s.)			0.978	73.000	0.331	0.166	0.114	Large
SOCIO-EMOTIONAL (opposite) (n.s.)			0.736	74.000	0.464	0.232	0.001	Small
Commitment (opposite)			1.920	68.000	0.059	0.030	0.227	Large
Homesickness: Distressed (opposite)			1.744	65.000	0.086	0.043	0.211	Large
Satisfaction (opposite) (n.s.)			1.236	71.000	0.221	0.110	0.145	Large
Peers (opposite) (n.s.)	6.762	0.011	0.632	73.000	0.530	0.265	0.074	Moderate
Social Integration (n.s.)			-0.526	28.915	0.603	0.302	0.062	Moderate
On-Campus Living, Social (n.s.)			-1.187	65.000	0.239	0.120	0.146	Large
On-Campus Living, Environment (n.s.)			-0.597	65.000	0.553	0.276	0.074	Moderate

[1]if the F and Sig. are not reported, assume that variances were equal and the p-value was greater than .05

[2]See Cohen, 1988, 284-287 as reported in Pallant, 2010, p. 243: .01 = small, .06 = moderate, .14 = large

Summary of Research Question #2

The analysis of high-risk domestic students showed that cumulative GPA and Socio-Emotional Success Markers were found to be significantly associated with fall-to-fall retention. In addition, the factors: Communication, Analytical, Social Integration and On-Campus Living, and Social were significantly associated with retention from fall-to-fall of the second year. However, the direction of the mean difference in Analytical factor scores was in the opposite direction than expected; that is, those who did not return for the fall semester of their second year had higher Analytical factor scores than those who did.

The analysis of high-risk international students indicated that of the five Success Markers for high-risk international students (MAP-Works^{TM} does not collect a combined ACT score for international students) there were no significant differences associated with retention to the fall semester of the second year. The factors Commitment and Homesickness: Distressed were significantly associated with retention of high-risk international students to the fall of their second year. Both factors were associated with large effect sizes, but both factors were in the opposite direction from expected. These results could be influenced by the small sample size for international students who did not return.

Research Question #3

Did first-time first semester freshman students, who were rated as high-risk on the retention scale from the MAP-Works^{TM} program, have a higher probability of retention from fall semester to spring semester and retention to his or her second year after an

intervention by trained faculty or staff compared to a high-risk student who did not receive an intervention?

Research question #3 is investigating whether or not the study participants who were rated as high-risk received an in-person intervention by one of their direct connects. Each student was assigned at least two direct connects who were responsible for reaching out to their high-risk students to offer help. A students mandatory direct connects included their academic advisor and their living group coordinator. For those students living in the residence halls, their residence hall coordinator was their direct connect. For those students living off campus, the Deans of Student Life were assigned a subset of off campus students; and for those students who were residing in a fraternity or sorority, the Greek Affairs Coordinators were their direct connects. Students could also be assigned an additional direct connect advisor if they fit within one of the following categories: TRIO program, Pilot program, K-State First-year Experience course faculty, intercollegiate athlete or University Experience faculty. A student would have two direct connects and possibly up to several additional ones.

Within the MAP-Works^{TM} program the direct connects recorded their interventions with their high-risk students. This information was used to determine how many of the high-risk students in fall 2012 and 2013 received a documented intervention.

To answer this question, "Is there a relationship in retention of high-risk students between those students who did receive an intervention and those students who did not receive an intervention?" the question was separated into four hypotheses as domestic and international students were treated differently within this study. Domestic students

will be discussed first followed by International students; both groups will be considered in terms of retention and retention.

Domestic Students

During fall 2012 and 2013, the MAP-Works™ program indicated that 599 domestic students were rated as high-risk on the MAP-Works™ scale. Of those 599 domestic students, 36 did not return and enroll in the spring semester. Out of the 599 high-risk domestic students 27 received an intervention and all of them were retained to the spring semester (see Table 4.26). The following analysis for domestic high-risk students discussed the significance for fall-to-spring retention as well as fall-to-fall retention.

Table 4.26. Counts and percentages for Research Question #3 (high-risk, domestic)

INTERVENTION	Fall-to-Spring RETENTION			Fall-to-Fall RETENTION		
Control (0)	Did not return (0)	36	6.3%	Did not return (0)	242	42.3%
	Returned (1)	536	93.7%	Retained (1)	330	57.7%
		N = 572			N = 572	
Direct Connect (1)	Did not return (0)	0	0.0%	Did not return (0)	5	18.5%
	Returned (1)	27	100.0%	Retained (1)	22	81.5%
		N = 27			N = 27	

Retention

Hypothesis 3a: Did first semester domestic freshman students who were rated as high-risk on the MAP-Works™ scale have a higher retention rate from fall-to-spring (retention) whether they received an intervention or not?

A one-tailed Chi-square test for independence, with Yates Continuity Correction adjustment was used as this was a two-by-two test was computed for high-risk domestic students. The Chi-square test indicated no association between the intervention and fall-

to-spring retention between the two groups, $X^2(1, n = 599) = .86$, $p = .35/2 = .18$, $phi = .06$ (small effect size) (Pallant, 2010, p. 220) (see Table 4.27 and Table 4.28).

Table 4.27. Chi-Square Tests for fall-to-spring retention (high-risk, domestic)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.808[a]	1	.179		
Continuity Correction	.865	1	.352		
Likelihood Ratio	3.427	1	.064		
Fisher's Exact Test				.397	.180
Linear-by-Linear Association	1.805	1	.179		
N of Valid Cases	599				
a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 1.62.					
b. Computed only for a 2x2 table					

Table 4.28. Symmetric Measures for fall-to-spring retention (high-risk, domestic)

		Value	Approx. Sig.
Nominal by Nominal	Phi	.055	.179
	Cramer's V	.055	.179
N of Valid Cases		599	

Hypothesis 3a was not supported. There were no significant differences in retention between high-risk domestic students who received an intervention and those who did not. What might impact this finding, resulting in no difference between groups, is the practice at Kansas State University to let students who would normally be dismissed for academic reasons, which would be a fall semester GPA below 1.0, to reenroll with permission of their Dean's Office. A student who is dismissed for having a GPA below 1.0 is first dismissed and then must agree to participate in the Sparks program in their spring semester. This program is designed to help the student get another

start on their academic career, it requires regular meetings with academic advisors as well as attending a course designed to help with study skills, test taking and connecting to the campus resources. This Sparks program is not being examined in this research but further research could help understand its impact upon the retention and retention of those students who fall below a 1.0 GPA.

Retention

Hypothesis 3b: Did first semester domestic freshman students who were rated as high-risk on the MAP-Works^{TM} scale have a higher retention rate from the fall semester of their first-year to the fall semester of their second year when they received an intervention over those who did not receive an intervention?

To understand this if a high-risk student who received an intervention was retained at a higher rate than those high-risk students who did not receive an intervention a one-tailed Chi-square test for independence, with Yates Continuity Correction adjustment, was used, a two by two test was computed for high-risk domestic students. The Chi-square test indicated a statistically significant association between the intervention and fall-to-fall retention, $X^2(1, n = 599) = 5.08$, $p = .02/2 = 0.01/1$, $phi = .10$ (small effect size) (Pallant, 2010, p. 220) (see Table 4.29 and Table 4.30).

Table 4.29. Chi-Square Tests for fall-to-fall retention (high-risk, domestic)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.022[a]	1	.014		
Continuity Correction	5.080	1	.024		
Likelihood Ratio	6.646	1	.010		
Fisher's Exact Test				.016	.010
Linear-by-Linear Association	6.011	1	.014		
N of Valid Cases	599				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.10.					
b. Computed only for a 2x2 table					

Table 4.30. Symmetric Measures for fall-to-fall retention (high-risk, domestic)

		Value	Approx. Sig.
Nominal by Nominal	Phi	.100	.014
	Cramer's V	.100	.014
N of Valid Cases		599	

Hypothesis 3b was supported. The implication is that the intervention for domestic high-risk students made a noted difference in their retention from fall to the following fall over those students who did not have an intervention. The same was not indicated for the fall-to-spring retention of high-risk domestic students. It is interesting to note that *all* of the high-risk students receiving an intervention persisted to the spring semester (see Table 4.26). This leads to questioning if other variables that are not being measured in this study are influencing retention, it suggests the need for additional years of data to distinguish between those receiving an intervention and those who did not for fall-to-spring retention.

International Students

Of the 76 international students who were rated as high-risk on the MAP-Works™ scale, all of the students returned for their spring semester. Ten of the high-risk students did receive an intervention and all of them were retained to the spring semester (Table 4.26).

When a student was rated as high-risk, his or her direct connect would invite the student in for a meeting to problem solve the challenges associated with high-risk. Most students who were rated as high-risk ignored their direct connects' offer of assistance and did not respond. It is important to understand if high-risk international students who had an intervention persisted to the spring semester at a higher rate than high-risk international students who did not receive an intervention

Hypothesis 3c: Did first semester international freshman students who were rated as high-risk on the MAP-Works™ scale have a higher retention rate from fall-to-spring whether they received an intervention or not?

Table 4.31. Frequencies and Percentages for Research Question #3 (international)

INTERVENTION	RETENTION			RETENTION		
Control (0)	Did not return (0)	2	3.0%	Did not return (0)	14	21.2%
	Returned (1)	64	97.0%	Retained (1)	52	78.8%
		N = 66			N = 66	
Direct Connect (1)	Did not return (0)	0	0.0%	Did not return (0)	0	0.0%
	Returned (1)	10	100.0%	Retained (1)	10	100.0%
		N = 10			N = 10	

Retention

To address questions of retention for high-risk international students this study used a one-tailed Chi-square test for independence, with Yates Continuity Correction

adjustment, as this was a two by two test was computed for high-risk international students. The Chi-square test indicated no association between the intervention and fall-to-spring retention between the two groups, X^2 (1, n = 76) = .00, p =1.00/2= .50, *phi* = .06 (moderate effect size) (Pallant, 2010, p. 220) (see Table 4.32 and Table 4.33). In addition, the minimum expected cell frequency assumption was violated as indicated in footnote a., Table 4.32. The expected cell frequency assumption is violated as 2 of the cells contained less than 5 (Field, 2009).

Table 4.32. Chi-Square Tests for retention (high-risk, international)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.311[a]	1	.577		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.572	1	.449		
Fisher's Exact Test				1.000	.753
Linear-by-Linear Association	.307	1	.579		
N of Valid Cases	76				
a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .26.					
b. Computed only for a 2x2 table					

Table 4.33. Symmetric Measures for retention (high-risk, international)

		Value	Approx. Sig.
Nominal by Nominal	Phi	.064	.577
	Cramer's V	.064	.577
N of Valid Cases		76	

Hypothesis 3c was not supported. There were no significant differences in retention between high-risk international students who received an intervention and those

who did not. The small sample size could impact this finding. What may also be impacting this finding, resulting in no difference between groups, is the practice at Kansas State University to let students who would normally be dismissed for academic reasons to reenroll with permission of their Dean's Office.

Retention

Hypothesis 3d: Did first semester international freshman students who were rated as high-risk on the MAP-Works™ scale have a higher retention rate from fall-to-fall whether they received an intervention or not?

To test this research questions a one-tailed Chi-square test for independence, with Yates Continuity Correction adjustment was used, as this was a two by two test was computed for high-risk international students. The Chi-square test indicated no association between the intervention and fall-to-fall retention between the two groups, $X^2(1, n = 76) = 1.38$, $p = .24/2 = .12$, $phi = .18$ (large effect size) (Pallant, 2010, p. 220) (see Table 4.34 and Table 4.35).

Table 4.34. Chi-Square Tests for retention (high-risk, international)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.600[a]	1	.107		
Continuity Correction[b]	1.380	1	.240		
Likelihood Ratio	4.402	1	.036		
Fisher's Exact Test				.193	.113
Linear-by-Linear Association	2.566	1	.109		
N of Valid Cases	76				
a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 1.84.					
b. Computed only for a 2x2 table					

Table 4.35. Symmetric Measures for retention (high-risk international)

		Value	Approx. Sig.
Nominal by Nominal	Phi	.185	.107
	Cramer's V	.185	.107
N of Valid Cases		76	

Hypothesis 3d was not supported. It is possible that there are too few international students to say definitively if the direct connect interventions made a significant difference. One trend occurred as 100% of all high-risk international students who received an intervention persisted to the spring semester and were retained to the following fall.

Summary of Research Question #3

The analysis for the research question #3 found that the intervention conducted by their direct connects for high-risk domestic students was significant for fall-to-fall retention. Although significance was found for this question the effect size was small. Fall-to-fall retention for international students found no association between those students who received an intervention and those who did not. The implication is that the intervention for domestic high-risk students made a difference in their retention from fall to the following fall. The small number of international students in this study may be a limiting factor in this study in understanding the fall-to-fall retention question.

The analysis for the research question #3 found that there was no significance for fall-to-spring retention for either domestic or international students. There were no significant differences in retention between high-risk international students who received an intervention and those who did not. What may be impacting this finding, resulting in no difference between groups, is the practice at Kansas State University to let students

who would normally be dismissed for academic reasons to reenroll with permission of their Dean's Office.

Of interest in this study is that all international students who received an intervention for both fall-to-spring retention as well as fall-to-fall retention were retained. While no significance was found, this trend that shows 100% of all high-risk international students receiving an intervention and then persisting to the spring semester and retained to the following fall is noteworthy. If a larger number of international students were in this study, the trend may show significance over time.

Research Question #4

Do the six Success Markers (i.e., risk factors) ─ Academic, Behavior & Activities, Financial Means, and Socio-Emotional ─ along with composite ACT score, cumulative GPA, and/or other independent variables (Gender, Race and Student Residence) predict retention to the second year for high-risk students?

From twenty factors, the MAP-Works™ survey calculates a score for each Success Marker (Financial, Academic, Behaviors & Activities, and Socio-Emotional). The Success Markers plus the combined ACT score and the spring cumulative GPA are six of the independent variables being tested. For the purposes of the hypotheses, "Success Marker scores" will mean the values from the combined ACT score, the cumulative GPA, and the four calculated values from MAP-Works™. Other independent variables (Gender, Race and Student Residence) were also included in each regression model tested.

Domestic students

Hypothesis 4a: Retention of high-risk domestic students who returned for the fall semester of their second year was predicted by the Success Marker scores and/or other independent variables.

Of the six Success Markers, Cumulative GPA, ACT Composite scores, Financial Means factor scores, and Socio-Emotional scores predicted retention of high-risk domestic students (see Table 4.37). Direct logistic regression was performed to assess for domestic, high-risk students the impact of a number of factors on the likelihood that respondents would return the fall semester of their second year (retention). The model contained three categorical, demographic independent variables (gender, race, and student residency), and six continuous Success Markers (ACT Composite score, Cumulative GPA, Financial Means, Academic, Behavior & Activities, and Socio-Emotional). Evaluation of diagnostic statistics was conducted to identify cases to be removed. The final dataset had neither cases with Cook's distance greater than 1.00 nor cases with DfBetas greater than 1.00 (see Table 4.36). With each iteration of the analysis, cases were removed where the standardized residuals were less than -4.00 or greater than 4.00 and where the leverage value was greater than (10+1)/n. The analysis was repeated until the Hosmer & Lemeshow test produced a non-significant (greater than .05) result. In the final data, 50 total cases were removed (588 – 538 = 50 cases). In this analysis, normalized residuals did fall below -4.00, but none were above 4.00. Otherwise, the final dataset from which the results are reported here meets the assumptions of direct logistic regression. Hypothesis 4a was supported by Cumulative GPA, Financial Means, Socio-Emotional, and ACT Composite score (see Table 4.40).

Table 4.36. Diagnostic statistics for direct logistic regression (high-risk, domestic)

	N				
	Valid	Missing	Mean	Minimum	Maximum
Predicted probability	538	0	.6208178	.00739	.99738
Predicted group	538	0	.67	0	1
Analog of Cook's influence statistics	538	0	.0196835	.00000	.24575
Leverage value	538	0	.0185874	.00120	.06558
Normalized residual	538	0	-.0242564	-4.65034	3.17958
DFBETA for constant	538	0	.0000135	-.21644	.31010
DFBETA for Gender(1)	538	0	-.0000041	-.04740	.04463
DFBETA for Race2	538	0	-.0000033	-.05331	.04251
DFBETA for StudentResidence(1)	538	0	.0000028	-.08965	.08861
DFBETA for ACTComposite	538	0	.0000006	-.00823	.00797
DFBETA for SpringTermCumGPA	538	0	-.0000044	-.05779	.01328
DFBETA for Factor06 Financial	538	0	-.0000065	-.02131	.01752
DFBETA for AcademicAACAVAR00003	538	0	.0000032	-.05151	.04021
DFBETA for BehaviorVAR00002	538	0	.0000015	-.03566	.03308
DFBETA for SocioEmotionalVAR00001	538	0	-.0000010	-.04942	.03875

The full model containing all predictors was statistically significant, $X^2(9, n = 538) = 249.35$, $p = .00$, indicating that the model was able to distinguish between respondents who returned the fall semester of their second year and students who did not return. The model as a whole explained between 37% (Cox & Snell R Square) and 50% (Nagelkerke R Square) of the variance in fall-to-fall retention; and was correctly classified in 80% of the cases. The model improved classification by approximately 18 percentage points (compared to 62% of the base model); this model is considered to be a good fit because the Hosmer and Lemeshow Test was not significant ($p = .11$). In the

direct logistic regression test, the Hosmer and Lemeshow Test should be greater than .05 to show support for the model.

Table 4.37. Direct logistic regression predicting the likelihood of freshman students returning for the fall semester of their second year (retention) (high-risk, domestic)

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Gender(1)	-.301	.265	1.289	1	.256	.740	.441	1.244
	Race2	.293	.195	2.255	1	.133	1.340	.915	1.964
	StudentResidence(1)	-.484	.355	1.859	1	.173	.616	.307	1.236
	ACTComposite	*-.127*	*.037*	*12.116*	*1*	*.000*	*.881*	*.820*	*.946*
	SpringTermCumGPA	*2.846*	*.257*	*122.606*	*1*	*.000*	*17.212*	*10.401*	*28.483*
	Financial	*.217*	*.086*	*6.337*	*1*	*.012*	*1.242*	*1.049*	*1.470*
	AcademicAACAVAR00003	-.087	.177	.242	1	.623	.916	.647	1.297
	BehaviorVAR00002	-.128	.179	.513	1	.474	.880	.620	1.249
	SocioEmotionalVAR00001	*.585*	*.165*	*12.651*	*1*	*.000*	*1.796*	*1.301*	*2.479*
	Constant	-5.226	1.346	15.075	1	.000	.005		

As shown in Table 4.37, four of the independent variables made a unique statistically significant contribution to the model (Cumulative GPA, Socio-Emotional Success Marker, Financial, and ACT Composite). The strongest predictor of being retained for the fall semester was Cumulative GPA, recording an odds ratio of 17.21. This indicated that respondents with higher cumulative spring grade point averages were seventeen times more likely to be retained in the fall semester of their second year, controlling for all other factors in the model. The odds ratio of 1.80 for Socio-Emotional indicated that higher values on the Socio-Emotional scale contributed to students being almost twice as likely to be retained to the fall semester of their second year, controlling for other factors in the model. The odds ratio of 1.24 for Financial indicated that higher values on the financial means factor item only slightly contributes to students being

retained to the fall semester of their second year, controlling for other factors in the model. The odds ratio for ACT Composite was .88, which is less than 1, indicating that for every increase in the ACT Composite score, students were .88 times less likely to return in the fall semester of their second year.

International Students

Hypothesis 4b: Retention of high-risk international students who returned for the fall semester of their second year was predicted by the Success Marker scores and other independent variables.

Of the six Success Markers only Cumulative GPA was found to contribute to retention along with Gender (female), and Student Residence also predicted retention of high-risk international students (see Table 4.39). Direct logistic regression was performed to assess the impact of a number of factors on international, high-risk students on the likelihood that respondents would return the fall semester of their second year (retention). The model contained two categorical, demographic independent variables (gender and student residency), and five continuous Success Markers (Cumulative GPA, Financial, Academic, Behavior & Activities, and Socio-Emotional). Evaluation of diagnostic statistics was conducted to evaluate if cases needed to be removed. Even though there were cases with standardized residuals greater than 4.00 or less than -4.00, no cases were removed. In addition, no cases were removed for violations of leverage. Any cases removed only caused errors in the analysis. Therefore, the final solution did violate some of the assumptions of the direct logistic regression. For instance, there were cases with Cook's distance greater than 1.00, and there were cases with DfBetas greater than 1.00 (Table 4.38). In addition, there were cases where the leverage value was

greater than (7+1)/n. However, the Hosmer & Lemeshow test produced a non-significant (greater than .05) result. Hypothesis 4b was supported by Cumulative GPA, Gender, and Student Residence (Table 4.40).

Table 4.38. Diagnostic statistics for direct logistic regression (high-risk, domestic)

	N				
	Valid	Missing	Mean	Minimum	Maximum
Predicted probability	74	0	.8108108	.04202	.99916
Predicted group	74	0	.86	0	1
Analog of Cook's influence statistics	74	0	.1295179	.00000	1.29778
Leverage value	74	0	.1081081	.00303	.65295
Normalized residual	74	0	-.0065827	-4.63692	1.60794
DFBETA for constant	74	0	-.0111717	-1.37675	2.15829
DFBETA for Gender(1 female)	74	0	-.0004984	-.37125	.40369
DFBETA for StudentResidence(1 off campus)	74	0	-.0099668	-.74092	1.09297
DFBETA for SpringTermCumGPA	74	0	.0005956	-.31392	.21289
DFBETA for Financial	74	0	.0009282	-.12626	.24184
DFBETA for AcademicAACAVAR00003	74	0	.0048296	-.30322	.39290
DFBETA for BehaviorVAR00002	74	0	-.0025430	-.48505	.24249
DFBETA for SocioEmotionalVAR00001	74	0	-.0007622	-.37366	.28512

The full model containing all predictors was statistically significant, $X^2(7, n = 74) = 25.15$, $p = .00$, indicating that the model was able to distinguish between respondents who returned the fall semester of their sophomore year and students who did not return. The model as a whole explained between 29% (Cox & Snell R Square) and 46% (Nagelkerke R Square) of the variance in fall-to-fall retention, and correctly classified 86% of the cases. The model improved classification by approximately 5% points

(compared to 81% of the base model); this model is considered to be a good fit because the Hosmer and Lemeshow Test was not significant (p = .81).

Table 4.39. Direct logistic regression predicting the likelihood of freshman students returning for the fall semester of their second year (retention) (high-risk, international)

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	*Gender(1)*	*-2.248*	*.957*	*5.516*	*1*	*.019*	*.106*	*.016*	*.689*
	StudentResidence(1)	*-5.033*	*1.494*	*11.352*	*1*	*.001*	*.007*	*.000*	*.122*
	SpringTermCumGPA	*1.592*	*.533*	*8.930*	*1*	*.003*	*4.912*	*1.729*	*13.952*
	Financial	.509	.295	2.972	1	.085	1.664	.933	2.968
	AcademicAACAVAR00003	.136	.560	.059	1	.808	1.145	.382	3.433
	BehaviorVAR00002	.704	.585	1.451	1	.228	2.023	.643	6.365
	SocioEmotionalVAR00001	-.887	.719	1.522	1	.217	.412	.101	1.686
	Constant	-3.707	3.369	1.210	1	.271	.025		

As shown in Table 4.39, three of the independent variables made a unique statistically significant contribution to the model (Cumulative GPA, Gender, and Student Residence). The strongest predictor of being retained for the fall semester was Cumulative GPA, recording an odds ratio of 4.91. This indicated that high-risk international students with higher cumulative spring grade point averages were almost five times more likely to be retained in the fall semester of their second year, when controlling for all other factors in the model. Both Gender and Student Residence had a negative effect on retention for high-risk international students based upon the B values (Table 4.39).

Table 4.40. Comparison of binary logistic regression models

Regression Model[a] (approach)	Significant Variables Included			B (SE)	95% CI for Odds Ratio			Cox & Snell	Nagel-kerke	Hosmer & Lemeshow	% im-prove-ment	Chi-Square
		Wald	Sig.		Lower	Odds Ratio	Upper					
Model 1 (high-risk domestic)	Cumulative GPA	122.61	.00	2.85	10.40	17.21	28.48	.37	.50	.11	18	X^2 (9, n = 538) = 249.35 p = .00
	SOCIO-EMOTIONAL	12.65	.00	.58	1.30	1.80	2.48					
	Financial	6.34	.01	.22	1.05	1.24	1.47					
	ACT Composite	12.12	.00	-.13	.82	.88	.95					
Model 2 (high-risk international)	Cumulative GPA	8.93	.00	1.59	1.73	4.91	13.95	.29	.46	.81	5	X^2 (7, n = 74) = 24.146 p = .00
	Gender (1)	5.52	.02	-2.25	.02	.11	.69					
	Student Residence (1)	11.35	.00	-5.03	.00	.01	.12					

[a]Both models were forced entry

Summary of Research Question #4

The analysis of high-risk domestic students using direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would return the fall semester of their second year (retention). The analysis showed that Cumulative GPA, Financial Means, Socio-Emotional, and ACT Composite score were found to be significantly associated with fall-to-fall retention for high-risk domestic students. The strongest predictor of retention was cumulative GPA with an odds ratio of 17.21 followed by Socio-Emotional with an odds ratio of 1.80, and then Financial with an odds ratio of 1.24. The final predictor, ACT Composite score, was .88, less than 1, indicating that for every increase in the ACT score students were .88 times less likely to return in the fall semester of their second year (see Table 4.40). This indicates that high-risk domestic students who had higher ACT composite scores were more likely to not be retained. This indicates the need for further research to understand why this occurred as the ACT Composite is used for admission criteria.

The analysis of high-risk international students using direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would return the fall semester of their second year (retention). The analysis showed that Cumulative GPA, Gender, and Student Residence were significantly associated with fall-to-fall retention for high-risk international student. The strongest predictor of retention was cumulative GPA with an odds ratio of 4.91. The odds ratio for Gender (Female) was .11 and Student Residence (Off-Campus) was .01, both were less than 1 which indicates that high-risk international students who were female and living

off-campus were less likely to be retained (see Table 4.40). These results could be the result of the small sample size for international students who did not return.

Chapter 5 - Summary, Discussion and Recommendations

Summary

This study investigated first-time first-year students who were rated as high-risk for retention by the MAP-Works™ program. As a part of this study, the MAP-Works™ Success Markers and Factors that were significant in showing a difference in the retention to the second semester and second year were identified. This study also investigated whether or not high-risk first-time first-year students had improved retention rates from the fall semester to the spring semester and to their second year when an intervention was conducted by trained faculty and student services staff. The analysis used data collected from the MAP-Works™ first-year transition survey offered at Kansas State University in fall 2012 and 2013.

The population for this study were Kansas State University, Manhattan Campus first time first semester freshman students for the fall of 2012 and 2013 who were determined to be high-risk for retention based on the MAP-Works™ instrument. According to the Office of Planning and Analysis Student Demographic Report in the fall of 2012 there were 3,897 first-time full-time freshman and in 2013, 3,776 first-time full-time freshman. For the fall 2012 and 2013 there were 1577 students who were identified as high risk for retention.

The data used in this ex post facto study originated from Kansas State University's MAP-Works™ program as well as from the Office of Planning and Assessment. The information provided included a combined dataset for fall 2012 and 2013 resulted in 7,903 first-time freshmen, their level of risk in their first semester as determined by the MAP-Works™ program, the interaction logs and notation of

intervention between direct connects and their students with details of the interaction, and their enrollment status for the second semester and second year. The direct connects were Kansas State University faculty and staff who documented their intervention interactions within the MAP-Works™ management logs.

First-year freshmen at Kanas State University during the fall of 2012 and 2013 met the requirements for participation in this study. First-year freshman for this study are defined as those students who enrolled, matriculated and attended class during the first week of the fall semester. Combined number of students within this study was 7911 students. There were 5512 (69.7%) lived on-campus, 869(11%) who lived off-campus and 1522 (19.3%) did not disclose their place of residency.

The research questions addressed by this study were as follows:

1. Were high-risk students who persisted to the second semester associated with different success marker scores (i.e., risk factors) than those who did not persist?
2. Were high-risk students who are retained to the second year associated with different success marker scores (i.e., risk factors) than those who were not retained?
3. Did first-time first semester freshman students, who were rated as high-risk on the retention scale from the MAP-Works™ program have a higher probability of retention from fall semester to spring semester and retention to his or her second year after an intervention by trained faculty or staff compared to a high-risk student who did not receive an intervention?

4. Do the six Success Markers (i.e., risk factors) ─ 1. Academic, 2. Behavior & Activities, 3. Financial Means, and 4. Socio-Emotional ─ along with composite 5. ACT score, 6. Cumulative GPA, and/or other independent variables (Gender, Race, and Student Residence) predict retention to the second year for high-risk students?

Quantitative data analysis methods were used in this study. The first and second research questions were answered using independent samples *t*-tests. The third research question was explored using a 2x2 Chi-square test for independence. The fourth research question was answered using a binary logistic regression analysis with forced entry method. For all research questions the significance level was set at .05.

Research Question #1

The analysis of high-risk domestic students showed that cumulative GPA and Socio-Emotional Success Markers were found to be significantly associated with fall-to-spring retention. In addition, Test Anxiety, Peers, Homesickness: Distressed, Academic Integration, Social Integration and Environment on Campus factor scores were significantly associated with retention from fall-to-spring for high-risk domestic students.

The analysis of high-risk international students indicated that cumulative GPA was found to be significantly associated with fall-to-spring retention. Self-Efficacy and Self-Discipline were also found to be significant for retention, but the mean differences were in the opposite direction than expected. That is, high-risk international students who did not return had higher factors scores for self-efficacy and self-discipline than those who returned for the spring semester of their freshman year.

Research Question #2

The analysis of high-risk domestic students showed that cumulative GPA and Socio-Emotional Success Markers were found to be significantly associated with fall-to-fall retention. In addition, the factors Communication, Analytical, Social Integration, and On-Campus Living, Social were significantly associated with retention from fall-to-fall of the second year. However, the direction of the difference in Analytical factor scores was opposite than expected. That is, those who did not return for the fall semester of their second year had higher Analytical factor scores than those who returned.

The analysis of high-risk international students indicated that of the five Success Markers (MAP-Works^{TM} does not collect a combined ACT score for international students), none were significantly associated with retention to the fall semester of the second year. The factors Commitment and Homesickness: Distressed were significantly associated with retention of high-risk international students to the fall semester of their second year. Both factors were associated with large effect sizes, but both factors were in the opposite direction from expected. These results could be influenced by the small sample size for international students who did not return.

Research Question #3

The analysis for the research question #3 found that the intervention conducted by their direct connects for high-risk domestic students showed a significant difference in retention for fall-to-fall retention. Although significance was found for this question the effect size was small. For fall-to-fall retention for international students no difference was found between those students who received an intervention and those who did not. The small number of international students in this study may be a limiting factor in this study in understanding the fall-to-fall retention question.

The analysis for the research question #3 found that there was no significance for fall-to-spring retention for either domestic or international students. There were no significant differences in retention between high-risk international students who received an intervention and those who did not. What may lead to no difference between groups, as mentioned earlier in more detail is the practice at Kansas State University to let students who would normally be dismissed for academic reasons, which is a fall semester GPA below 1.0, to reenroll with permission of their Dean's Office.

Research Question #4

The analysis of high-risk domestic students using direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would return the fall semester of their second year (retention). The analysis showed that Cumulative GPA, Financial Means, Socio-Emotional, and ACT Composite score were found to be significantly associated with fall-to-fall retention for high-risk domestic students. The strongest predictor of retention was cumulative GPA with an odds ratio of 17.21 followed by Socio-Emotional with an odds ratio of 1.80, and then Financial with an odds ratio of 1.24. The final predictor, ACT Composite score, was .88, indicating that for every increase in the ACT score students were .88 times less likely to return in the fall semester of their second year (Table 4.40). This indicates that high-risk domestic students who had higher ACT composite scores were more likely to not be retained.

The analysis of high-risk international students using direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would return the fall semester of their second year (retention). The analysis showed that Cumulative GPA, Gender, and Student Residence were found to be significantly associated with fall-to-fall retention for high-risk international student. The

strongest predictor of retention was cumulative GPA with an odds ratio of 4.91. The odds ratio for Gender (Female) .11 and Student Residence (Off-Campus) .01, were both less than 1 which indicates that high-risk international students who were female and living off campus were less likely to be retained (Table 4.40). These results could be the result of the small sample size for international students who did not return. Future research needs to be conducted to fully understand these findings.

Discussion

The purpose of this study was to examine the MAP-Works^{TM} program and determine which of the Success Markers and Factors were associated with retention for high-risk, first-year students at Kansas State University. The study also investigated whether high-risk, first-year students, who had an intervention by the students direct connect faculty and staff was able to show a significant retention differences over those high-risk students who did not have an intervention. The findings of this study suggests that MAP-Works$^{TM\ is}$ able to differentiate between those Success Markers and Factors that are significant in retention.

For domestic students, the Success Marker that was significantly associated with both fall-to-spring and fall-to-fall retention is cumulative GPA. For international students, cumulative GPA was only significantly associated with fall-to-spring retention. Using cumulative GPA as a predictor for retention has been the standard for many years. Pascarella and Terenzini (2005) indicated in their findings that cumulative GPA is the strongest predictor of retention to their second year. The regression analysis that was conducted within this study also confirmed that cumulative GPA was significant in

predicting retention. Cumulative GPA was identified as having contributed the most to the retention regression model of any of the Success Markers or Factors.

As faculty and staff work with first-year students, their understanding the importance of cumulative GPAs on retention can inform the way in which advising and other academic feedback occurs in the academic calendar. Kansas State University has a practice of informing first-year students where they stand academically after the first eight weeks; failure to provide this feedback may lead to students not understanding just how far they may be below the academic standards. In this study those students who did not return for their second semester had an average cumulative GPA of 1.487 versus 2.983 for those students who did return.

The Financial Success Marker for high-risk domestic students was associated with retention on the regression model predicting retention. What is interesting about the Success Marker Financial in this study is this is the only time Financial appeared to contribute significantly to retention in any of the research questions. From the beginning of the study there was an expectation by the researcher that the Success Marker, Financial would be a strong predictor in retention. In another study Herzog (2005) suggested a similar finding in which financial aid, which is associated with the Financial Success Marker, is strongly predictive to future enrollment. Something that this research did not investigate is the buildup of financial stress on a student as the cost of attendance builds over multiple years. Another contributor to a lower financial stress level is practice of first-year students receiving scholarships from their communities helping supplement their overall financial picture in their first year. International students may not express financial stress in the same manner as domestic as each international student must prove

financial solvency upon their application for their student visa. The financial stress may come prior to their arrival in the United States.

The factors associated with living on-campus versus living off-campus was found to be significant for those high-risk students who lived on-campus in several of the research questions. It is not surprising this MAP-Works™ study showed that first-year students living on-campus have some measure of influence over retention versus those students living off-campus. There are numerous studies that show for individual campus studies living on campus will result in higher retention for first year students (Potts, Schulz, & Foust, 2003, Zheng, Saunders, Shelley, Whalen 2002, Thompson, Samiratedu, & Rafter, 1993, Velez, 1985). Schudde (2011) found in a large study of U.S. Department of Education data that students who lived on campus had a significantly greater chance of retention compared to those first year students who lived off campus. As decisions are being made whether or not to have a first-year residency policies having a tool such as MAP-Works™ will be helpful in gaining an understanding of the variables related to retention for each campus.

The intervention by trained faculty and staff direct connects with those first-year students who are identified as high-risk for retention students is a cornerstone of the MAP-Works™ program. The MAP-Works™ program is based upon early identification of a student who is a high-risk for retention concern is something that almost any university would be interested in knowing. This study showed that domestic students who had an intervention, had a significantly more positive difference in fall-to-fall retention than those high-risk domestic students who did not receive an intervention. No

significance was found for international students in this study, although all who had an intervention were retained to their second year.

Of interest in this study is that all international students who received an intervention for both fall-to-spring retention as well as fall-to-fall retention were retained. While no significance was found, a trend where 100% of all high-risk international students who received an intervention persisted to the spring semester as well as were retained to the following fall is interesting.

Early detection and intervention is the key for students with adjustment and integration issues (Tinto, 1993). Programs that emphasize social and problem-solving skills, leadership skills, assertiveness, coping, stress management, practical living skills, and counseling tend to facilitate the transition to college more successfully (Baker & Siryk, 1983; Poulton & Paul, 1982). As a part of the MAP-Works™ program direct connects need to identify those high-risk students and intervene as quickly as possible. The overall number of documented interventions by the direct connects was lower than what was expected, only 72 high-risk students received a documented intervention combined for 2012 and 2013. The direct connects report difficulty in getting these identified high-risk students to respond to their invitation to come in for a visit about the identified risk. They use different means to reach these students, but most do not come in. Future research could be conducted to understand why these identified high-risk for retention students do not come in.

A critique of this study is the fact that the method of intervention was not investigated in this study. This study relied upon the training and professional judgment of the direct connect to help problem solve with the high-risk student just what needed to

be done to eliminate the retention concern. An additional study could also investigate the response time from when the student was identified as high-risk until the first intervention occur.

In many ways this study raised more questions than it answered. The MAP-Works™ program gives some indication into what may be making a difference in retention of first-year students. Gaining an understanding of what Success Markers and Factors are contributing to retention can be used to focus in on issues and students who may fall into one or more of the risk categories.

Research Recommendation

Further research is recommended in the following areas:

1. Future studies need to investigate the SPARKS program which is a second chance retention program for first semester freshman who have been dismissed but are allowed to reenroll if they participate in the program. Understanding the Sparks program will help identify its impact upon retention and retention of those students who also are rated as high-risk by MAP-Works™.
2. Future longitudinal studies need to be conducted for fall-to-spring retention for those high-risk students who received an intervention.
3. Addition years of data that provides a larger data set for international students will help strengthen the findings.
4. A future study needs to be conducted to understand why several of the factors for International student retention and retention went in the opposite direction than was predicted.

5. A future student needs to be conducted to look into the retention and retention of those international students who are enrolled in the English Language Program.
6. A longitudinal study needs to be conducted following these 2012 and 2013 first-time first-year students to graduation to evaluate what Success Markers or Factors were identified as important to their retention to graduation.
7. A retention study using the MAP-Works™ program along with qualitative departure data should be conducted to gain a deeper insight into why students leave the institution.
8. A study conducted to investigate the impact of interventions led by the faculty and staff with high-risk students.
9. A study needs to investigates why high-risk students in this study who had higher ACT scores were not as likely to be retained.

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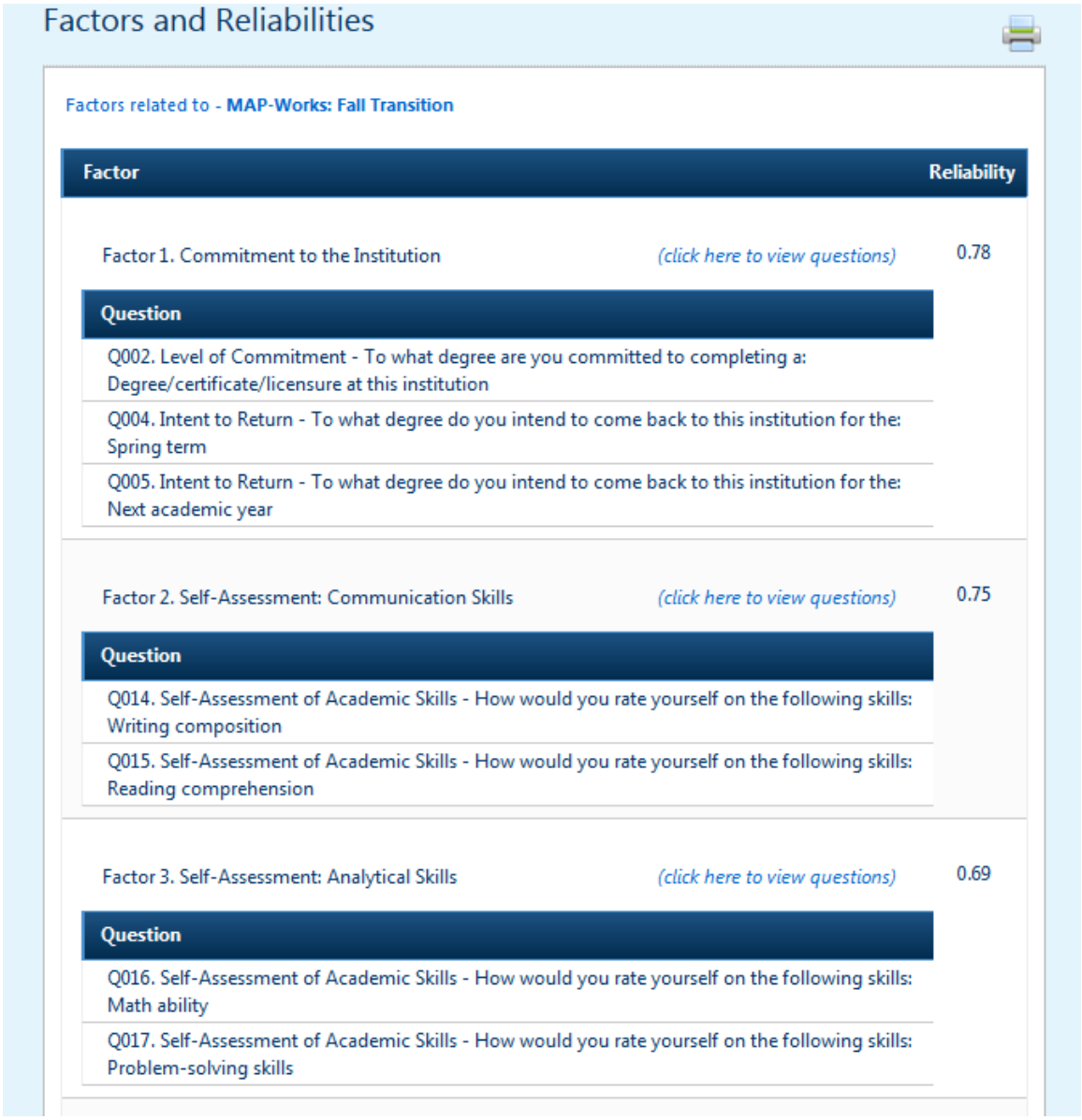
Appendix A - Factor Reliabilities

Taken from MAP-Works™



Factors and Reliabilities

Factors related to - **MAP-Works: Fall Transition**

Factor	Reliability
Factor 1. Commitment to the Institution *(click here to view questions)*	0.78

Question
Q002. Level of Commitment - To what degree are you committed to completing a: Degree/certificate/licensure at this institution
Q004. Intent to Return - To what degree do you intend to come back to this institution for the: Spring term
Q005. Intent to Return - To what degree do you intend to come back to this institution for the: Next academic year

Factor	Reliability
Factor 2. Self-Assessment: Communication Skills *(click here to view questions)*	0.75

Question
Q014. Self-Assessment of Academic Skills - How would you rate yourself on the following skills: Writing composition
Q015. Self-Assessment of Academic Skills - How would you rate yourself on the following skills: Reading comprehension

Factor	Reliability
Factor 3. Self-Assessment: Analytical Skills *(click here to view questions)*	0.69

Question
Q016. Self-Assessment of Academic Skills - How would you rate yourself on the following skills: Math ability
Q017. Self-Assessment of Academic Skills - How would you rate yourself on the following skills: Problem-solving skills

Factor 4. Self-Assessment: Self-Discipline *(click here to view questions)* 0.79

Question
Q018. Self-Assessment of Management Skills - To what degree are you the kind of person who: Is self-disciplined
Q019. Self-Assessment of Management Skills - To what degree are you the kind of person who: Follows through with what you say you're going to do
Q020. Self-Assessment of Management Skills - To what degree are you the kind of person who: Is dependable

Factor 5. Self-Assessment: Time Management *(click here to view questions)* 0.78

Question
Q021. Self-Assessment of Management Skills - To what degree are you the kind of person who: Plans out your time
Q022. Self-Assessment of Management Skills - To what degree are you the kind of person who: Makes "to-do lists"
Q023. Self-Assessment of Management Skills - To what degree are you the kind of person who: Balances time between classes and other activities (work, student activities, etc.)

Factor 6. Financial Means *(click here to view questions)* 0.87

Question
Q011. To what degree are you confident that you can pay for: Next term's tuition and fees
Q012. To what degree are you confident that you can pay for: Monthly living expenses (e.g. room, board, utilities, rent)
Q013. To what degree are you confident that you can pay for: Social activities (e.g. eating out, going to movies) with your friends

Factor 7. Basic Academic Behaviors *(click here to view questions)* 0.72

Question
Q047. Academic Behaviors - To what degree are you the kind of person who: Attends class
Q048. Academic Behaviors - To what degree are you the kind of person who: Takes good notes in class
Q049. Academic Behaviors - To what degree are you the kind of person who: Turns in required homework assignments
Q050. Academic Behaviors - To what degree are you the kind of person who: Spends sufficient study time to earn good grades

Factor 8. Advanced Academic Behaviors *(click here to view questions)* 0.78

Question
Q051. Academic Behaviors - To what degree are you the kind of person who: Participates in class
Q052. Academic Behaviors - To what degree are you the kind of person who: Communicates with instructors outside of class
Q053. Academic Behaviors - To what degree are you the kind of person who: Works on large projects well in advance of the due date
Q054. Advanced Study Skills - To what degree are you the kind of person who: Studies in a place where you can avoid distractions
Q055. Advanced Study Skills - To what degree are you the kind of person who: Studies on a regular schedule
Q056. Advanced Study Skills - To what degree are you the kind of person who: Reads the assigned readings within a day before class

Factor 9. Academic Self-Efficacy *(click here to view questions)* 0.86

Question
Q038. Academic Self-Efficacy - To what degree are you certain that you can: Do well on all problems and tasks assigned in your courses
Q039. Academic Self-Efficacy - To what degree are you certain that you can: Do well in your hardest course
Q040. Academic Self-Efficacy - To what degree are you certain that you can: Persevere on class projects even when there are challenges

Factor 10. Academic Resiliency *(click here to view questions)* 0.88

Question
Q041. Academic Resiliency - To what extent do the following statements describe you: You do everything you can to meet the academic goals you set at the beginning of the semester
Q042. Academic Resiliency - To what extent do the following statements describe you: You are a hard worker in your classes
Q043. Academic Resiliency - To what extent do the following statements describe you: When you know a course is going to be difficult, you put in extra effort
Q044. Academic Resiliency - To what extent do the following statements describe you: When you get a poor grade, you work harder in that course

Factor 11. Peer Connections *(click here to view questions)* 0.93

Question
Q075. Peer Connections - On this campus, to what degree are you connecting with people: Who share common interests with you
Q076. Peer Connections - On this campus, to what degree are you connecting with people: Who include you in their activities
Q077. Peer Connections - On this campus, to what degree are you connecting with people: You like

Factor 12. Homesickness: Separation *(click here to view questions)* 0.64

Question
Q097. Homesickness - To what degree do you: Miss your family back home
Q098. Homesickness - To what degree do you: Miss your old friends who are not at this school
Q099. Homesickness - To what degree do you: Miss your boyfriend/girlfriend who is not at this school

Factor 13. Homesickness: Distressed *(click here to view questions)* 0.86

Question
Q100. Homesickness - To what degree do you: Regret leaving home to go to school
Q101. Homesickness - To what degree do you: Think about going home all the time
Q102. Homesickness - To what degree do you: Feel an obligation to be at home
Q103. Homesickness - To what degree do you: Feel that attending college is pulling you away from your community at home

Factor 14. Academic Integration *(click here to view questions)* 0.87

Question
Q154. Overall Adjustment - Overall, to what degree are you: Keeping current with your academic work
Q155. Overall Adjustment - Overall, to what degree are you: Motivated to complete your academic work
Q156. Overall Adjustment - Overall, to what degree are you: Learning
Q157. Overall Adjustment - Overall, to what degree are you: Satisfied with your academic life on campus

Factor 15. Social Integration *(click here to view questions)* 0.90

Question
Q158. Overall, to what degree: Do you belong here
Q159. Overall, to what degree: Are you fitting in
Q160. Overall, to what degree: Are you satisfied with your social life on campus

Factor 16. Satisfaction with Institution *(click here to view questions)* 0.89

Question
Q161. Overall Evaluation of the Institution - Overall, to what degree: Would you choose this institution again if you had it to do over
Q162. Overall Evaluation of the Institution - Overall, to what degree: Would you recommend this institution to someone who wants to attend college
Q163. Overall, please rate your experience at this institution:

Factor 17. On-Campus Living: Social Aspects (Module) *(click here to view questions)* 0.86

Question
Q078. On-Campus Living - To what degree are you: Hanging out with other residents
Q079. On-Campus Living - To what degree are you: Making friends with others in the hall/building
Q080. On-Campus Living - To what degree are you: Satisfied with the social activities in your hall/building

Factor 18. On-Campus Living: Environment (Module) *(click here to view questions)* 0.73

Question
Q081. On-Campus Living - To what degree are you: Adjusting to living in on-campus housing
Q082. On-Campus Living - To what degree are you: Able to study in your room/hall
Q083. On-Campus Living - To what degree are you: Able to sleep in your room

Factor 19. On-Campus Living: Roommate Relationship (Module) *(click here to view questions)* 0.82

Question
Q085. On-Campus Roommates - To what degree do your roommate(s): Respect your sleep time
Q086. On-Campus Roommates - To what degree do your roommate(s): Respect your property
Q087. Overall, to what degree are you having problems with your roommates

Factor 20. Off-Campus Living: Environment (Module) *(click here to view questions)* 0.73

Question
Q089. To what degree are you: Able to study in your room/home
Q090. To what degree are you: Able to sleep in your room/home
Q091. To what degree are you: Satisfied with your overall living environment

Factor 21. Test Anxiety (Module) *(click here to view questions)* 0.88

Question
Q063. When you have a test, to what degree do you: Have an uneasy, upset feeling before taking an examination
Q064. When you have a test, to what degree do you: Feel anxious about an exam even when you're well prepared
Q065. When you have a test, to what degree do you: Perform worse on exams because you're worrying that you'll do badly