This dissertation titled
Developmental Ecology of First-Generation College Students:
Exploring the Relationship Between Environmental Support and Academic Performance

by

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Abstract

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Developmental Ecology of First-generation College Students: Exploring the Relationship Between Environmental Support and Academic Performance

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First-generation college students account for a significant portion of college students in the United States. While the growing attendance of this population attests to higher education’s commitment to access and social mobility, first-generation college students are not as successful as their later-generation peers by many measures. The growing number of first-generation students and the social, economic, and civil ramifications of their inequitable struggles in higher education require research to move beyond measuring outcomes and to explore influences on student success in new ways. Bronfenbrenner’s ecological model of development and Kuh’s work on student engagement are combined to create a theoretical perspective through which relationships among academic and social support and academic performance of first-generation college students are explored. Quantitative methods were used to analyze survey data from sophomore students who are enrolled in the Spring 2015-2016 semester at Ohio University. The findings are presented in a manner that informs advocates, researchers, and policymakers who hope to support first-generation college students at universities in the United States.
Dedication

To my parents, who gave me the opportunity to pursue a meaningful education so many years ago. To my children, who will forever be my inspiration. To my wife, for her undying support of my studies, selfless commitment to our family, and immeasurable patience.
Acknowledgments

It is with great gratitude that I acknowledge my committee for their guidance and support throughout my research. The completion of this research would not have been possible without the help of Dr. David Horton, Dr. Krisanna Machtmes, Dr. Peter Mather, and Dr. Michael Williford. I would like to especially thank Dr. Mather for his leadership of the committee and commitment to my development as a researcher and writer. The completion of this work is as much a product of my committee’s efforts as my own.

I would like to thank DeVry University and especially Dr. Marilyn Wiggam for their support, flexibility, and understanding throughout this process. The ability to pursue this research, remain committed to my career, and maintain a balance in life is a direct result of Dr. Wiggam and the University’s commitment to my growth and development as an educator and leader.
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3</td>
</tr>
<tr>
<td>Dedication</td>
<td>4</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>5</td>
</tr>
<tr>
<td>List of Tables</td>
<td>11</td>
</tr>
<tr>
<td>Chapter One: Introduction</td>
<td>13</td>
</tr>
<tr>
<td>Statement of Problem</td>
<td>16</td>
</tr>
<tr>
<td>Purpose of Study</td>
<td>17</td>
</tr>
<tr>
<td>Research Questions</td>
<td>17</td>
</tr>
<tr>
<td>Primary research question</td>
<td>18</td>
</tr>
<tr>
<td>Sub-question 1.</td>
<td>18</td>
</tr>
<tr>
<td>Sub-question 2.</td>
<td>18</td>
</tr>
<tr>
<td>Sub-question 3</td>
<td>18</td>
</tr>
<tr>
<td>Significance of Study</td>
<td>18</td>
</tr>
<tr>
<td>Limitations of Study</td>
<td>20</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>22</td>
</tr>
<tr>
<td>Further Discussion on Defining “First-Generation”</td>
<td>24</td>
</tr>
<tr>
<td>Measuring Academic and Social Support</td>
<td>25</td>
</tr>
</tbody>
</table>
Theoretical Perspective ........................................................................................................ 26

Organization of Study ....................................................................................................... 27

Chapter 2: A Review of the Literature ................................................................................ 28

Further Exploration of Theoretical Perspectives .............................................................. 30

Nested systems theory of ecological development .......................................................... 30

Microsystem ...................................................................................................................... 31

Mesosystem ....................................................................................................................... 31

Exosystem ......................................................................................................................... 32

Macrosystem ..................................................................................................................... 32

Further Analysis of First-Generation College Student Microsystems ............................. 32

Relationships among Engagement and Student Learning ............................................. 34

Examining First-Generation College Student Status ....................................................... 36

Demographic Characteristics ......................................................................................... 37

Academic Performance and Social Integration ............................................................... 43

Academic preparation ....................................................................................................... 43

Persistence ......................................................................................................................... 47

Social integration ............................................................................................................... 54

Connecting Attributes to Outcomes ............................................................................... 59

Thematic Concepts in Literature ..................................................................................... 60
Assessing Validity ................................................................. 98

Content validity ................................................................................. 99

Construct validity ........................................................................... 100

Variables and Analysis ................................................................. 101

Sub-question 1. ............................................................................... 101

Analysis............................................................................................ 102

Sub-question 2. ............................................................................... 102

Analysis............................................................................................ 102

Sub-question 3 ............................................................................... 104

Analysis............................................................................................ 104

Required Sample Size........................................................................ 105

Chapter 4: Data Analysis and Results............................................. 107

Descriptive Results .......................................................................... 107

Overview of student data. ............................................................... 107

Assessing Non-response Bias ......................................................... 113

Overview of Social Support .......................................................... 116

Overview of Academic Support ..................................................... 121

Research Questions and Data Analysis ............................................ 124

Sub-question 1. ............................................................................... 124
Sub-question 2. ....................................................................................................... 133

Sub-question 3. ....................................................................................................... 138

Chapter 5: Summary, Conclusions, and Recommendations ........................................... 147

Summary of the Study .............................................................................................. 147

Summary of Data Analysis ......................................................................................... 148

Descriptive results.................................................................................................... 149

Academic and social support. .................................................................................... 150

Research sub-question 1. ....................................................................................... 151

Research sub-question 2. ....................................................................................... 152

Research sub-question 3. ....................................................................................... 153

Discussion................................................................................................................... 154

Conclusion .................................................................................................................. 156

Recommendations for Future Research................................................................. 157

Policy Recommendations ......................................................................................... 159

References ................................................................................................................... 162

Appendix A-Student Communications ........................................................................... 177

Appendix B-Research Questionnaire......................................................................... 180

Appendix C-Institutional Review Board Approval ..................................................... 188
List of Tables

Table 1: Demographic Characteristics of Students who Completed the Survey .......... 108
Table 2: Percent of Respondents by Campus of Enrollment ................................................. 111
Table 3: Percent of Respondents by College of Enrollment ............................................... 112
Table 4: Percent of Respondents by GPA Range ............................................................ 113
Table 5: Overview of Social Support Items as Percentage of Student Responses ........ 119
Table 6: Overview of Academic Support Items as Percentage of Student Responses ... 123
Table 7: Chi-squared Analysis: Generation Status to Gender ............................................ 125
Table 8: Chi-squared Analysis: Generation Status to Race or Ethnic Identification ...... 126
Table 9: Chi-squared Analysis: Generation Status to Marital Status .............................. 127
Table 10: Chi-squared Analysis: Generation Status to Living Situation While Enrolled .................................................................................................................................................................................. 128
Table 11: Chi-squared Analysis: Generation Status to Hours Worked Per Week On Campus .................................................................................................................................................................................. 129
Table 12: Chi-squared Analysis: Generation Status to Hours Worked Per Week Off Campus .................................................................................................................................................................................. 130
Table 13: Chi-squared Analysis: Generation Status to Caring for Child ......................... 131
Table 14: Chi-squared Analysis: Generation Status to Caring for Elderly Parent ......... 131
Table 15: Chi-squared Analysis: Generation Status to Caring for Other Adult .......... 132
Table 16: Results of t-test and Descriptive Statistics for Age by Generation Status...... 132
Table 17: Results of t-test and Descriptive Statistics for GPA by Generation Status .... 133
Table 18: GPA and Descriptive Statistics for First- and Later-Generation Students in All Colleges........................................................................................................................... 135
Table 19: Two-Way Analysis of Variance of GPA by Generation Status and College of Enrollment....................................................................................................................... 136
Table 20: GPA and Descriptive Statistics for First- and Later-Generation Students at All Campuses ........................................................................................................................................ 137
Table 21: Two-Way Analysis of Variance of GPA by Generation Status and Campus of Enrollment....................................................................................................................... 138
Table 22: Mean Responses and Descriptive Statistics for First- and Later-Generation Students for Academic Support Items ............................................................................ 139
Table 23: Multivariate and Univariate Analysis of Variance of Academic Support Measures by Generation Status........................................................................................................... 141
Table 24: Mean Responses and Descriptive Statistics for First- and Later-Generation Students for Social Support Items........................................................................................................... 142
Table 25: Multivariate and Univariate Analysis of Variance of Social Support Measures by Generation Status........................................................................................................... 145
Chapter One: Introduction

First-generation college students are prevalent throughout colleges and universities spanning many geographical, economical, and cultural settings (Warburton, Bugarin, & Nunez, 2001; Ward, Siegel, & Davenport, 2012). To illustrate the presence of first-generation college students, Ishitani (2003) reported that first-generation college students accounted for approximately 364,000 of the 1.3 million freshmen who completed the SAT in 2001. In a 2006 study, Strayhorn provided that first-generation college student enrollment had been increasing for a decade and first-generation college students comprised 30% of college enrollments at that time. Engle and Tinto (2008) reported that 4.5 million low-income, first-generation college students were enrolled in higher education institutions. In 2010, the U.S. Department of Education reported that in the 2007-2008 school year, 51% of students in two-year institutions and 38% of students in four-year institutions had parents with no college experience.

First-generation college students not only face the challenges expected of most students entering higher education, but must often overcome an inequitable number of challenges as compared to their later-generation college student peers (ACT, 2013; Bradbury & Mather, 2009; Coffman, 2011; Hodges, 1999; Ishitani, 2003; Padgett, Johnson, & Pascarella, 2012; Warburton et al., 2001; Ward et al., 2012). Many of these challenges derive from attributes commonly associated with first-generation college student status. For example, first-generation college students are more likely than later-generation college students to be employed full-time and to be married (Warburton et al., 2001). Additionally, Pike and Kuh (2005) reported that first-generation college students
were less likely than their counterparts to live on campus. In 2009, Bradbury and Mather provided first-person accounts of how a “pull of home” (p. 265) and other environments in which the student operates, or has recently operated, affected the quality of their post-secondary experience and their ability to integrate into the university milieu. First-generation college students, as the research shows, operate in many environments that compete with that of the university for time and attention. As such, it is important that research further explore the relationship among academic and social support and students’ academic performance to better understand how university sponsored and other means of support may, or may not, be helping first-generation students improve their academic performance.

The current body of research on first-generation college students aims to better understand and support the population through two distinct methods. Both methods appear to be somewhat equally represented in the research. Many researchers closely examine educational outcomes of first-generation college students as they progress through the post-secondary education system through outcomes-based research (ACT, 2013; Bowen, Chingos, & McPherson, 2009; Chen, 2005; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Warburton et al., 2001). The second approach found in research strongly represents the views of the first-generation college students themselves, often though their own words, through interviews, focus groups, and other techniques that allow readers to fully grasp and appreciate the challenges first-generation college students face in college (Bradbury & Mather, 2009; Bui, 2002; Coffman, 2011; Engle, Bermeo, & O’Brien, 2006; Reid & Moore, 2009). These studies of the students’
perspectives of personal challenges, academic preparedness, integration into the university setting, and other psychosocial factors provide excellent insights into the challenges that lead to the academic results analyzed by outcomes-based studies.

Although research exists on the experiences and outcomes of first-generation college students, there is very little research that combines developmental ecology and student engagement as a theoretical perspective to examine student outcomes. Theories of developmental ecology often heavily inform the theoretical perspective of studies, but are less often applied to study first-generation college students and the developmental paths that influence their academic performance. Padgett, Johnson, and Pascarella’s (2012) study examining status attainment theory, cultural capital theory, and social capital theory is an excellent example of how outcome-based research can be predicated on development theories. Although limited works using such a theoretical perspective to analyze development theories and academic performance exist for first-generation college students, more research in this area is needed.

Using Bronfenbrenner’s nested systems theory (Bronfenbrenner, 1979) and Kuh’s work on student engagement and learning (Carini, Kuh, & Klein, 2006; Kuh, 2001, 2003; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Kuh, Kinzie, Schuh, & Whitt, 2005) to create a theoretical perspective, this study compiled survey data from sophomore students enrolled in the Spring 2015-2016 semester and used statistical analysis to explore relationships among academic and social support and academic performance. The use of survey data to examine Bronfenbrenner’s theory, typically used in research using
interviews or case studies, will add a valuable perspective to the current body of research examining both developmental ecology and academic performance.

**Statement of Problem**

There is evidence that first-generation college students have lower educational aspirations, lower academic achievement, higher attrition rates, and less understanding of the academic and social milieu of a college or university (ACT, 2013; Bowen et al., 2009; Ishitani, 2003; Oldfield, 2012; Padgett et al., 2012; Warburton et al., 2001). Additionally, these students are becoming more prevalent in higher education institutions (Ward et al., 2012). Even though the number of first-generation college students in American post-secondary institutions is growing, first-generation college students continue to be less successful than their later-generation college student counterparts (Bowen et al., 2009; Warburton et al., 2001). While access efforts of colleges and universities are working to grow first-generation college student enrollment, first-generation college students are not reaching their educational goals and are incurring lost time, opportunity costs in missed wages, and increased debt without the increased ability to earn additional income based on skills obtained in higher education. This is especially true for those who do not earn a degree (Bowen et al., 2009). Addressing these issues requires a better understanding of why first-generation college students are unsuccessful and how they can be better supported. There is a paucity of empirical evidence that explores the relationship between academic and social support and academic performance.

Before efforts can be made to support first-generation college students, one must better understand some of the reasons they are less successful. Research has shown that
first-generation college students are more likely to work full-time, carry a part-time class schedule, live off campus, be married, have a low socioeconomic status, and have children (Warburton et al. 2001, Ward et al., 2012). Each of these characteristics, and the environments they create, may place pressures on first-generation college students that compete with higher education for students’ time, energy, and resources.

**Purpose of Study**

The purpose of this study was to explore relationships among academic and social support and academic performance of first-generation college students. This was achieved through an analysis of student-reported data on actual academic performance, levels of participation in academic and social activities, and if such participation was perceived by the student to benefit their academic performance. The findings of this study inform faculty, administrators, and students of how academic success may be encouraged through involvement in certain academically and socially supportive activities. Such data could also be used to inform students’ use of their time and academic leaders’ decisions concerning resource allocation and policy.

**Research Questions**

The focus of this research centered on the research questions below. The primary research question was answered through an analysis of data driven by the three sub-questions. The sub-questions were designed to guide the analysis by describing characteristics of first-generation students, describing the overall academic performance of first-generation college students, and finally exploring the relationship among first-generation college students’ academic and social support and academic performance. In
all cases, the analysis compared the data of first-generation students to that of later-generation students to help illustrate differences between the two groups.

**Primary research question.** What is the relationship among academic and social support and academic performance of first-generation college students?

**Sub-question 1.** What differences exist between first-generation college students and later-generation college students concerning age, race, marital status, gender, living arrangement, and parenting/caregiving responsibilities?

**Sub-question 2.** How do first-generation college students perform academically compared to later-generation college students?

**Sub-question 3.** How do academic and social support relate to first-generation college students compared to later-generation college students?

**Significance of Study**

Higher education has reduced demarcation between social classes and improved social mobility for first-generation college students and disadvantaged populations for more than a century, especially after the Morrill Acts of the late nineteenth century (Burbacher & Rudy, 2008). Higher education researchers have an obligation to further understand the needs of this group and support their success. This study informs efforts to further student success and reduce marginalization by providing evidence about the influence of academic and social support on a growing population of first-generation college students in the United States. While expanding the research available on first-generation college students, this study provides an empirical analysis of a popular theory of developmental ecology often used in educational research to understand how academic
and social support affect disadvantaged and underrepresented groups (Parsons, Hinson, & Sardo-Brown, 2001).

In addition to informing and furthering the work of researchers, this study is of significant importance to practitioners in the field of higher education for two primary reasons. As the number of first-generation college students continues to increase, practitioners and administrators must act prudently to ensure the success of students from this group. With mounting pressures from state and federal governments to provide access to higher education and increased accountability, universities may face financial challenges if these students are not academically successful (Dougherty, Natow, Bork, Jones, & Vega 2013). The analysis of the relationship among academic and social support reported by first-generation college students and the students’ academic performance in this study will do much to inform campus administrators and faculty about the reasons first-generation college students are may be less likely to succeed.

Policy makers and political thought leaders also may benefit from this research. Even with the increased cost of college, higher education is financially rewarding (Daly & Bengali, 2014). However, significant gaps still exist between the earnings of those who attend college and those who successfully complete a degree. This phenomenon is known as the “sheepskin effect” (Bowen et al., 2009, p. 266). As state and federal government and lobbyist involvement grows at the state and national level, it is critical that researchers inform decisions through applicable, evidence-based research such as this study (McMillen, 2010). The involvement of research is especially important when state and federal government involvement includes both funding models and underrepresented
groups. Such issues can be politically charged and leveraged for political gain while affecting the lives of millions of Americans, many of whom have been historically marginalize because of their race, ethnicity, or SES (Spring, 2010). Empirical studies with practical applications help ground political decisions in evidence-based research and keep the policy development focused on students’ needs.

**Limitations of Study**

The sample used for analysis created limitations for generalizability. All students surveyed were from Ohio University. As can be seen by contrasting Bradbury and Mather (2009) and Reid and Moore (2008) and as presented by Hadgedorn (2004), differences exist in the experiences and development of rural, suburban, and urban students. The university setting in this study represents a particular educational setting and students with unique demographic and cultural characteristics. As such, the findings may not be generalized to different institutional types, regions, or cultural groups.

Further, the sample was surveyed at a single point in time in students’ education. All students were surveyed during the Spring semester of their sophomore year (Spring 2015-2016). The concern then, is that some students who matriculated as freshmen and experienced varying levels of academic and social support may have discontinued enrollment before the time of the survey and were not available to provide data on their experiences. Data from students who have already discontinued enrollment may add a valuable perspective, but the collection and analysis of data from students who have already left the university is outside the scope of this research. The focus of this research was on the relationship among academic and social support and academic performance of
students who are still enrolled. Second, the analysis at a single point in time may not provide a full view of the long-term effects of varying levels of academic and social support (Light, Singer, & Willett, 1990). The analysis of the data only illuminates the nature of the relationship between academic and social support and academic performance during the students’ enrollment prior to the survey. The exploration of such supports’ and their relationship with retention and long-term academic success would require a longitudinal design that is not within the scope of this study.

The study faced limitations in that the first-generation college students surveyed provided self-reported perceptions of academic and social support. Each student’s perception is of the utmost importance, and is the centerpiece of the study. However, it is noteworthy that what they “feel” and what “is” may differ. For example, being challenged by faculty member may not appear to promote academic success to a student while enrolled, but reflection upon how the challenge forced the student to push themselves later in life may cause the student to realize being challenged was a large part of their growth and development.

Additionally, it is impossible to discern each student’s true measure of the level of academic and social support from a given environment. This limitation is created by inconsistency in subjects’ interpretation of the scale used on the survey (Light et al., 1990). For example, students may not realize how important a certain person, program, or idea was to their success until they have matured, reflected, or even left the university environment. Allowing the summer between the freshman and sophomore year may give students time to reflect and make meaning of their experiences, but unappreciated or
unrealized support functions may not be captured. This again, is an excellent basis for a different study using longitudinal design.

Definition of Terms

It is important that terms used throughout this study are used consistently and well-understood by the readers. The terms below are defined and discussed to ensure accuracy in interpreting the design and results of the research and applying findings in practice.

- **Academic Performance**-this study used students’ cumulative GPA at the beginning of the Spring 2015-16 semester as a measure of academic performance. Student GPAs have been used to assess academic performance and learning in similar studies such as Kuh et al. (2008) and Carini et al. (2006).

- **Academic Support**-refers to the frequency of involvement in student experiences that the student perceives to promote successful academic performance. This definition for the construct of academic support was developed specifically for this study.

- **Environment**-describes a geographic location that not only represents the physical area, but the influences that directly affect students’ perceptions of and experiences in higher education as a result of interacting with or in the location. This definition of environment was developed from a perspective of developmental ecology (Bronfenbrenner, 1979).

- **First-generation college student**-is a student who is enrolled as a degree seeking student in an institution of higher education whose parents have not competed a
bachelor degree. Many definitions for first-generation status have been used in research (Supiano, 2014; Ward et al., 2012). The definition used for this term is further explored below.

- **Later-generation college student**-Terms and definitions for non-first-generation students vary across research. The term later-generation college student was first found in Barry, Hudley, Kelly, & Cho, (2009). The definition for later-generation student in this study is a student with at least one parent that has completed a bachelor’s degree or higher.

- **Parents**-refers to students’ natural parents or legal guardians. The researcher acknowledges that social capital and other benefits may be passed on to students from step-parents, adoptive parents, grandparents whom assume guardianship, and other situations in which students are raised by parents other than natural parents. Individuals who provide financial support, housing, and other basic needs for students as youths likely have an influence on how students perceive and value higher education. It was important that this research included these influential individuals when determining generation status. As such, this broad definition of parents was developed for this study.

- **Social Support**-refers to the frequency of involvement in student experiences that the student perceives to positively impact their social experience in college. This definition for the construct of social support was developed specifically for this study.
Further Discussion on Defining “First-Generation”

As the study and support of first-generation college students gains popularity in research, the debate of how to define “first-generation” continues to be a point of disagreement (Supiano, 2014; Ward et al., 2012). The least inclusive definition requires a student’s parents to have no education past the secondary level. Alternatively, many researchers espouse defining “first-generation” as students whose parents have not completed a four-year degree. While seemingly the most popular, these two definitions only represent the ends of a continuum of inclusivity used when defining this term.

Ward et al. (2012) provides a detailed discussion of the evolution of these definitions and their use. In their study, Ward et al. retraced the history of the term from its conception in the 1960s in the TRIO program, which stated that first-generation included “all students whose parents have not obtained a postsecondary degree” through other uses of the term which mandate that “neither parent attended college” (p. 4). More recently, Supiano (2014) wrote about the debate and contradictions in defining first-generation in higher education law and practice. Research has shown that students within this continuum, such as those whose parents have some college experience or two-year degrees, may benefit from varying levels of social and cultural capital when matriculating (Bowen et al., 2009; Padgett et al., 2012). Care must be taken when referencing first-generation college students, but similarities exist in the students’ attributes regardless of the rigor used when identifying this group (Bowen et al., 2009; Ward et al., 2012).

Not acknowledging research using all popular definitions to identify first-generation college students would limit the scope, depth, and effectiveness of the
research. First-generation college students, defined by any popular stratification, often have common disadvantages correlated with their status and many of these attributes create environments that do not foster success in higher education (Bowen et al., 2009; Ward et al., 2012). This study refers to first-generation college students as those whose parents have not obtained a bachelor’s degree. This is the most inclusive category, added breadth and depth to the scope of the discussion, and allowed more research to be considered.

**Measuring Academic and Social Support**

Academic and social support are important factors in the study. Neither of these constructs can be directly measured and must be assessed through analysis of measurable indicators that represent each construct. The questionnaire used in the Student Involvement Study at Ohio University will be modified to collect data for the study. The questionnaire is used by the Office of Institutional Research, Residence Life, and the Office of the Dean of Students each year to conduct a study on student involvement in academic, social, and other activities (Burk, 1992). The portion of the Student Involvement Study questionnaire used in this study was created based on the work of Astin and Tinto. Thus, modifications were made to collect data that will better align with this research which uses the work of Bronfenbrenner and Kuh as a theoretical perspective.

The subsection of the questionnaire which collects data on the importance and satisfaction of academic involvement was modified to collect data describing if involvement in academic activities was perceived as promoting academic performance,
and thus providing academic support. This data will provide a measure of academic support through the level of involvement and level of perceived support from the involvement. The subsection of the questionnaire which collects data on the importance and satisfaction of social involvement was modified to collect data describing if involvement in social activities was perceived as positively impacting their college experience, and thus providing social support. This data will provide a measure of social support through the level of involvement and level of perceived support from the involvement. A detailed discussion of the data collection instrument is provided in Chapter 3.

**Theoretical Perspective**

This study has a theoretical perspective informed by two popular concepts in the study of higher education: Bronfenbrenner’s Nested Systems Theory (Bronfenbrenner, 1979) and Kuh’s work on the relationships between student engagement and student learning (Carini et al., 2006; Kuh, 2001, 2003; Kuh et al., 2008; Kuh et al., 2005). This study focused on how the frequency of involvement in environments of varying levels of support is related to academic performance. As such, Bronfenbrenner’s work on how environmental support can buffer challenges faced by students and influence development provided critical context to frame the study. Additionally, many aspects of this study parallel with Kuh’s work studying the relationships among engagement and learning through data from the National Survey of Student Engagement (NSSE). Kuh’s work provided excellent context for the discussion of relationships between participating in academically productive activities and student learning. Using Kuh’s work alongside
Bronfenbrenner’s helped frame the study as one examining the impact of academic and social support from students’ environments (i.e., Bronfenbrenner) by studying variables that previous work has shown to be associated with learning outcomes (i.e., Kuh).

**Organization of Study**

The information in this study is presented in five chapters. In the first chapter, the foundation of the study is described by outlining the problem being addressed, the purpose of the study, the research questions, definition of terms, the theoretical underpinnings, and limitations that need illuminated. Understanding this first chapter provides critical information about the significance and importance of this research. The second chapter provides a review of literature on first-generation college students and organizes current research to situate this study in the current body of knowledge to support this group. The concluding section of the second chapter points the gap in research this study seeks to address.

In the third chapter, the methods used to gather and analyze data are detailed. Chapter three also outlines and describes the instrument used in data collection and the statistical methods used to analyze the survey data. Chapter four continues to focus on the data collected, provides the results of the analysis, and addresses key findings in the context of the research questions. The final chapter provides readers with a summary of the purpose and design of the study, reviews current programs implemented by universities seeking to support first-generation college students, and makes recommendations for further understanding and supporting first-generation college students through research.
Chapter 2: A Review of the Literature

A review of available research is critical in situating a study in the existing body of knowledge in a given discipline and identifying potential gaps (Creswell, 2013). Further, a thorough literature review assists researchers in providing rationale and need for a study, and can assist in the selection of the methodology for the research. According to Cooper (1985) “regardless of the capacities of the social scientists, expanding literature necessitates the collecting, evaluating, and synthesizing of scholarship in order to bring coherence and perspective to problem areas” (p. 4). As suggested by Creswell (2014), this literature review will be comprised of the components outlined below.

To begin, a more detailed discussion of the theoretical perspectives of this study is provided. Bronfenbrenner’s ecological development theory is further examined to underscore the relationship between dissonance and environmental support in the development of a student. After a more robust presentation of nested systems theory, highlights of Kuh’s work with the National Survey of Student Engagement are provided to illuminate how Kuh’s work informs and strengthens the study.

In the second section of the literature review, research on first-generation college student status is presented. In this section, research on first-generation college students is synthesized to highlight key themes in research about this population. This analysis will provide a foundation to better understand the population and add depth to the discussion of potentially related variables.

In the third section research examining characteristics which influence academic outcomes of first-generation college students as compared to later-generation college
students is presented. The research examining these outcomes provides great detail to frame this study’s analysis of GPAs of later- and first-generation college students. This second section also provides an analysis of social integration into the university first-generation college students experience throughout higher education. The research included provides excellent insight into the experiences of first-generation college students and the inequitable challenges members of this group may face when attempting to integrate into a university setting.

The fourth section of the literature review examines literature that has attempted to use theory of developmental ecology to illustrate relationships between first-generation college student status, academic outcomes, and influences from environments in which later- and first-generation college students operate. Studies that attempt to answer research questions similar to those of this study are examined. The findings of the research on variables similar to those used in this study provide a context to which the findings of this study can be compared.

The final section of the literature review synthesizes the findings of each section and examines deficiencies in the current body literature. In the last section, this literature review provides a brief summary and analysis of the findings, points to gaps in current literature and further illuminates the need for this study. This synthesis highlights the importance of the issue, shows the value for study at hand, and better frames the discussion of methods used to research identified voids in the national discussion of supporting first-generation college students.
Further Exploration of Theoretical Perspectives

In this section, theoretical perspectives of this study are presented in greater detail. Bronfenbrenner’s work on environmental influences and how they affect student development is at the heart of this research. The section below outlines important aspects of his theory and how it was used in this study of academic and social support and learning outcomes. Additionally, this section gives an overview of Kuh’s work on student engagement and how his research design and findings informed the design of this study.

**Nested systems theory of ecological development.** The analysis of the data provided by the surveys of first- and later-generation college students was conducted through a lens heavily influenced by Bronfenbrenner’s theory of developmental ecology as presented in his 1979 book *The Ecology of Human Development: Experiments by Nature and Design*. Bronfenbrenner’s nested systems model was not only helpful in the organization and identification of students’ environments, but informs the discussion and analysis of the importance of academic and social support in the students’ lives. A detailed discussion of Bronfenbrenner’s theory is prudent in understanding the theoretical base which underpins the research and analysis of this study.

This study uses Bronfenbrenner’s theory of developmental ecology to explore how academic and social support received from proximal processes affect the academic performance of first-generation college students. Based on Bronfenbrenner’s nested systems theory and other popular development theories, it was expected that first-generation college students who experience higher levels of academic and social support to act as buffers may have higher levels of academic performance (Renn & Reason, 2013;
Evans et al., 2009). This study used survey data describing academic support, social support, and academic performance to further explore this concept.

Bronfenbrenner’s model uses a nested-systems approach to explore the ecological influences on student development (Bronfenbrenner, 1976, 1979). The systems in Bronfenbrenner’s model are delineated primarily by their distance from the student. This study focuses on the relationships between the student and the systems in which the student is directly involved, and thus centered on microsystems as tools for analysis. The four remaining systems merit a review however, to situate our detailed use of the microsystems to examine the importance and levels academic and social support from environments in which students operate. The following delineation of systems begins with the closest proximity to the student and continues to stretch further from the student to include large-scale, long-term influences that only affect the student by affecting nested systems in which the student operates.

**Microsystem.** Microsystems are the environments in which the student is directly involved (Bronfenbrenner, 1979). Students and microsystems can be thought of “touching” each other. Students and microsystems both change and develop due to their direct interactions (Bronfenbrenner, 1979). Examples of microsystems for students could include dorms, classrooms, jobs, family at home, learning communities, and athletic teams. The specific microsystems studied in this research include the students’ home, on-campus living situation, classroom(s), work environment, and extra/curricular activities.

**Mesosystem.** Mesosystems, in which microsystems are embedded, consist of the relationships between microsystems (Bronfenbrenner, 1979). Evans, Forney, Guido,
Patton, and Renn (2010) describe the mesosystem as a system “where students’ multiple microsystems interact to create a web of developmental possibilities” (p. 164). An analysis of the mesosystem may include exploring the influences from the relationships among work, familial, and educational microsystems.

**Exosystem.** The components of exosystems include contexts that do not include the student directly, but affect the systems in which the student operates, and therefore shape students’ development (Bronfenbrenner, 1979). The microsystems, and the relationships among them (mesosystems), are nested within the exosystems. Exosystems may include national education policies, spousal workplaces, university policies, or student immigration policies and the relationships that exist among them.

**Macrosystem.** Macrosystems encompass, and thus influence, the micro-, meso-, and exosystems (Bronfenbrenner, 1979). Macrosystems are comprised of historical, cultural, and social forces that throughout time have a cumulative effect on the more proximal systems which influence, and are influenced by, students (Bronfenbrenner, 1979). Macrosystemic influences could include access to higher education for minorities and women, expectations of obtaining higher education, and other historical trends. Evans et al. (2010) explains “the macrosystem contains the sociocultural building blocks that become visible in the proximal processes of the student” (p. 129).

**Further Analysis of First-Generation College Student Microsystems**

Academic and social support required of and provided by microsystems were the primary focus of this research, and thus further discussion about these systems is merited. The data collection instrument used focused primarily on the systems in which the
students operate directly, and the importance and level of academic and social support students receive from these systems. As a study of influences students receive from operating in multiple environments it is critical that the microsystem is assiduously explored. Below, a more detailed discussion is provided to illuminate nuances about the microsystems.

Paradoxically, both synergy and appropriate levels of dissonance among microsystems are critical to student development (Renn & Reason, 2013; Evans et al., 2010). High levels of dissonance not met with adequate support may cause students to be overwhelmed and regress (Renn & Reason, 2013; Evans et al., 2010). A discussion of synergy and dissonance requires the understanding of microsystems that play an influential role in students’ lives in the context of higher education. Providing adequate academic and social support for first-generation college students is critical, as many of the first-generation college students’ attributes create microsystems which are likely to inhibit their ability to reach high-levels of academic performance (ACT, 2013; Bradbury & Mather, 2009; Warburton et al., 2001).

Many characteristics of first-generation college students likely create microsystems that cause unmitigated dissonance and decrease the potential for development (Bradbury & Mather, 2009; Reid & Moore, 2008; Roe Clark, 2006). Consider for example that first-generation college students are more likely than their later-generation college student peers to work full-time and attend college part-time, and may need to do so to fulfill needs such as obtaining food and shelter (Warburton et al., 2001). The likely high level of importance of each of these microsystems and low level of
academic and social support from each may greatly impact the student’s role in higher education. Without supportive measures such as flexible scheduling or financial assistance to supplement the lacking academic and social support received from these important microsystems, the practice of balancing a work schedule, domestic responsibilities, and course load may not become an opportunity for development but may cause the student to regress and leave higher education. In this example, the support received from the two microsystems was not adequate relative to the level required of the two microsystems and resulted in the student abandoning higher education.

While somewhat detailed, the analysis of the systems used to stratify environments influencing students’ development helps illuminate potential barriers to success in higher education. Further, understanding the proximity of systems in relationship to the student brings to the fore the painful reality that the support provided by the university has limited reach and many student issues will be outside the university’s control. However, through understanding the levels of academic and social support from environments, researchers and educators can better understand how changes made directly and indirectly instigate or inhibit student development in systems including the university.

**Relationships among Engagement and Student Learning**

Bronfenbrenner’s theory provided a lens through which this study will view the relationships among academic and social support and academic performance; however, the work of George Kuh on student engagement and learning outcomes strengthens the selection of variables used in the study and informed the analysis of findings. Kuh’s work
spans many years of studying the influence of engagement on persistence, learning, and more recently student GPAs through data provided by NSSE. Major findings from Kuh’s work, and their connections to this study, are discussed below.

NSSE is administered through the Indiana University Center for Survey Research and has been conducted in written and web modalities at hundreds of colleges since its first administration in 2000 (Kuh, 2001). NSSE surveys are administered to first-year and senior students at participating universities. Data describing of levels of engagement that can be compared to peer institutions is provided back to institutions and other stakeholders. NSSE questions can be grouped into five benchmarks of “effective educational practices” (Kuh, 2003, p. 26). These five benchmarks include “level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environments” (Kuh, 2003, p. 26). Kuh’s research has found that certain groups of students tend to be more engaged than others. Groups more likely to be engaged, as measured by NSSE data, include full-time students, students living on campus, and students in learning communities (Kuh, 2003). These findings should be addressed, as first-generation students are less likely than their later generation counterparts to be in one of these groups (Warburton et al., 2001).

There are many similarities between the design, goals, and administration of the NSSE and this study. For example, the NSSE relies solely on student feedback to measure levels of student participation in activities that may relate to learning and academic performance. Like the NSSE, the survey in this study asked students to provide
data on items that could not be feasibly observed in any other manner (Kuh, 2001). In another similarity, the NSSE does not directly measure student outcomes. Research connecting NSSE results, as a proxy for student engagement, often uses other measures of learning such as GPA, GRE scores, and other learning assessment tools (Carini et al., 2006). Using performance measures independent from the survey aligns with the design of this study in which student observations of their own activity are tested for association with GPAs acting as a proxy for academic performance.

Kuh’s research has consistently shown statistically significant relationships between levels of participation in certain activities and student academic performance (Carini et al., 2006; Kuh et al., 2008). Kuh’s study of the relationships among student-reported participation in academic and social activities and academic performance provides a theoretical foundation for this study. This study differs; however, in that student responses provided data on perceived academic and social support from participation in given activities. Using this data, this study focused on if perceived support affects first- and later-generation students differently in response to Kuh’s (2003) call for further research on engagement patterns of varying groups of students.

**Examining First-Generation College Student Status**

Before examining specific details concerning academic outcomes of first-generation college students, it is important that literature illuminating common trends among this group is presented. While each student takes a unique developmental path through higher education, it must be acknowledged that certain groups, such as first-generation college student, will show trends in behavior and will be more or less likely
than other groups to participate in certain behaviors. In this opening section, demographic information about the group is presented to provide a more thorough understanding of the characteristics of first-generation college students. Additionally, common risk factors associated with first-generation college student status are examined to highlight major issues likely faced by students in this population.

**Demographic Characteristics**

While first-generation college students are a diverse group by many measures, demographic trends exist throughout this population. Researchers and advocates of any group must understand the elements that comprise large portions of the group and trends that appear over time. It is important to note however, that each student is an individual and will experience unique challenges and developmental opportunities on their educational path. The purpose of reviewing demographic characteristics of first-generation college students is not to promote overgeneralization, but to clearly show that first-generation college student status is often associated with certain student attributes. Much of this literature review focuses on the likelihood of academic success of this population as a whole, but advocates must remain cognizant of the diversity within this group.

Saenz, Hurtado, Barrera, Wolf, and Yeung (2007) contributed greatly to the body of knowledge on first-generation college students with their comprehensive report, *First in My Family: A Profile of First-Generation College Students at Four-Year Institutions Since 1971*. The study examined more than three decades of survey data from the Cooperative Institutional Research Program’s Freshman Survey from 1971 to 2005. The
report provides that in 2005, a larger portion of women than men entering college were first-generation college students. Additionally, the survey data show that Hispanic students are the most likely to be first-generation college students, and the report continues to acknowledge that while the study is of four-year institutions, the proportion of Hispanic students would likely be even higher if data from two-year schools were included. In 2005, the proportion of Latino college students that were first-generation was 38.2% (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007). Saenz et al. continued to provide that 22.6% of African American students in the study were first-generation college students. In addition to ethnicity, the 2007 study considers the likelihood of citizenship of first-generation college students. In 2005, nearly 30% of all non-citizen students were first-generation college students (Saenz et al., 2007). This makes non-citizens the second most likely group to be first-generation college students behind Hispanics. The study provides that when selecting a college, first-generation college students strongly consider the academic reputation of the institution, but are very likely to attend an institution within 50 miles of their home and less likely to live on campus (Saenz et al., 2007).

The 2007 report is informative in beginning to understand the first-generation college student population; however, certain aspects of the methodology must be addressed. Saenz et al. (2007) only includes those students attending public or private four-year institutions, which may have skewed the data by not including students of two-year universities. Consider, for example, that Ward et al.’s (2012) analysis of data from the National Center for Higher Education found that 54.9% of all first-generation college
students choose a two-year institution as their first educational institution. Issues in
genralizability become more apparent when comparing Ward et al.’s finding to the
23.3% of later-generation college students in Saenz et al. (2007) who choose to start at a
two-year school. As such, research from many studies must be considered to paint a more
complete portrait of first-generation college students.

The results of Bui’s (2002) report align well with the findings of Saenz et al.
(2007) and offer descriptive data of first-generation college students as opposed to
proportional studies within certain groups. Bui provided that the first-generation college
student population is demographically different from the rest of the student population in
three major ways. First-generation college students in the study are more likely to
identify as a minority, more likely to speak a language other than English at home, and
more likely to be from a lower SES (Bui, 2002). Bui’s study was localized to a single
university with a relatively small sample and may therefore lack generalizability, but the
findings align with other reports and should be considered when addressing “Who are
first-generation college students?”

Engle, Bermeo, and O’Brien (2006) add great detail to the description of first-
generation college students as a group. In their study of first-generation college students
in southwest United States, Engle et al. provided many findings that align with previous
studies while including first-generation college students who attend two year universities.
This is important, as a disproportionate number of first-generation college student attend
two-year universities (Ward et al., 2012) and excluding first-generation college students
who attend of two-year schools may skew data used to describe this population. Engle et
confirmed that first-generation college students are likely to be minorities and from a low SES. Additionally, the 2006 study added that first-generation college students were more likely than their later-generation college student peers to be female, have children which depend on their care, be married, be older, and have earned a GED as opposed to a high school diploma.

In their 2001 study of academic preparation and outcomes of first-generation college students, Warburton et al. analyzed national data to discover trends in first-generation college student academic preparation and post-secondary outcomes. In doing so, the 2001 study provided one of the most comprehensive reviews of first-generation college student data available. The 2001 report is often cited in first-generation college student literature and informs multiple sections of this literature review. In later sections, characteristics concerning first-generation college students’ academic preparation as discovered by the study are analyzed. In this section, the data provided by Warburton et al. (2001) is used to compare characteristics of first-generation college students to their later-generation college student peers.

When comparing first-generation college students to later-generation college students, Warburton et al. (2001) found that first-generation college students are more likely to attend part-time while working full-time, are more likely to stop out or downward transfer, and are more likely to leave their institution and never return. While the likeliness of these events was reduced in cases where first-generation college students took a more rigorous high-school curriculum, correlations were present in most situations, even those controlled for additional variables. In addition to a positive
correlation with academic difficulties, first-generation college student status was found to be correlated with many other attributes that may decrease the likelihood of success. Such attributes include an increased need for one or more remedial courses and lower GPAs. First-generation college students also tend to enroll in less prestigious, two-year institutions, and four-year comprehensive universities as opposed to private and research institutions (Warburton et al., 2001). Additionally, first-generation college students tend to choose less-specific majors than their later-generation college student counterparts (Warburton et al., 2001).

Trends in the national data aligned with many of the findings of the localized studies with smaller sample sizes. Warburton et al. (2001) found that first-generation college students were more likely to be older than their later-generation college student counterparts. Of students whose parents earned a bachelor’s degree, 98.6% were 24 years old or younger; only 91.2% of first-generation college students fell in the same age bracket. Of the first-generation college students studied, 7.1% of first-generation college students were over 30 as compared to only .5% of later-generation college students. Warburton et al. also showed that first-generation college students were more likely than students whose parents attended or graduated college to be a minority: 61.3% of first-generation college student were White Non-Hispanic compared to 70.6% of those whose parents had some college and 78% of those whose parent graduated from college with a bachelor’s degree. The national dataset examined in the study aligned with others in that it found that first-generation college students were more likely than later-generation college students to speak a language other than English in their home, to be from a low
SES, and to be married. Additionally, first-generation college students were found more likely to be born outside of the United States.

Taken together, these studies, while varying in sample size and location, show trends within the first-generation college student population. The studies above not only align with each other in that first-generation college students have common characteristics such as the likelihood of being older, low-SES, a minority, a female, working full-time, and having children, but these common findings align with studies from the past two decades (Choy, 2001; Horn & Nunez, 2000; Oldfield, 2007; Terenzini, Springer, Pascarella, & Nora, 1996). While it cannot be overemphasized that first-generation college students have unique individual experiences and developmental paths, understanding the reoccurring and often identified characteristics of students in the population is important in ascertaining proximal environments that influence development and tenably their GPA. To that point, it is imperative that our discussion of the first-generation college student population doesn’t conclude with a simple listing of demographic information.

In the next section, key elements of the first-generation college student are examined–academic outcomes and social integration. While literature on social integration is explored as a single subject, literature on academic outcomes is initially discussed in the context of first-generation college students’ academic preparation for college-level work and then examined in the context of traditional measures of academic performance.
Academic Performance and Social Integration

In this section, scholarship on academic performance and social integration is explored to inform the discussion as related to first-generation college students and environmental influences affecting this population. Two bodies of literature will inform the discussion of academic outcomes: academic preparation and persistence. The inclusion of academic preparation is merited to understand the barriers the first-generation college students face in successfully reaching their educational goals. The second body of literature discussing persistence provides detailed analyses of the inequitable outcomes achieved by first-generation college student relative to later-generation college students. Academic preparation and persistence represent two key areas of scholarship concerning academic outcomes. Social integration is also explored in detail in this section. Below, the discussion begins with a review of academic preparation of first-generation college students.

Academic preparation. A salient theme throughout first-generation college student research is the concern for the level of general academic preparation of first-generation college students. Universities not sensitive to this heightened need for remediation may lose first-generation college students, thus affecting retention (Tinto, 1987) and revenue (McMillen, 2010), may perpetuate imposter phenomenon (Langford & Clance, 1993) and disengagement, and may further divide the gap between first-generation college students and economic success. Lacking academic preparation changes students’ experiences in the higher education setting, creating challenges potentially not experienced by better-prepared peers and adding to dissonance already felt
by developing students (Reid & Moore, 2008). Details of inadequate academic preparation of first-generation college student relative to later-generation college student are presented below.

In their study of the first-generation college student success, Warburton et al. (2001) posit that academic preparation at the secondary level is correlated with academic success at post-secondary institutions. Correspondingly, Warburton et al. found that first-generation college students were less likely to take a rigorous high-school curriculum and few took courses transcending basic high-school requirements. First-generation college students were reported to be more likely than later-generation college students to take geometry or algebra II as their highest math and less likely to take calculus (Warburton et al., 2001). Students with the first-generation college student status were less than half as likely as their peers to take college admissions tests and those that completed the tests were more likely to receive markedly lower scores (Warburton et al., 2001). Additionally, Warburton et al. reported that first-generation college students are commonly in need of remedial courses, especially when compared to populations whose secondary curricula exceeded the basic high-school requirements. The 2001 report posited that having the status of first-generation college student was negatively correlated with academic rigor, which was positively correlated with success after matriculation into the post-secondary setting. Warburton et al. presented informative trends in the academic preparation of first-generation college students; however, first-person accounts of academic challenges provide valuable depth in understanding individual situations of first-generation college students.
In an interview-based study sponsored by the Pell Institute for the Study of Opportunity in Higher Education, Engle et al. (2006) provided detailed examples of individual challenges correlated with academic preparation of first-generation college students. The qualitative format allowed the discussion to move the focus from correlated outcomes to narrated causes. This perspective allowed for a deeper understanding of appropriate remedies for first-generation college students. For example, Warburton et al. (2001) correlated academic struggles with non-rigorous high school coursework completed by first-generation college students. Engle et al., through interviews and dialog, provides that opportunities to learn beyond the required secondary curriculum can help first-generation college students succeed and posits that the lack of encouragement and opportunity for this advanced learning may have a relationship with attrition which is then correlated with lacking rigor after the fact. Such pre-departure insights are paramount to clearly understanding the relationships between variables and creating supportive interventions.

Despite their differing methods, both studies provided similar trends of first-generation college students entering the academy. Similar to Warburton et al. (2001), Engle et al. (2006) cites lacking academic rigor as a correlate to first-generation college student attrition. The 2006 study continued to discuss the detrimental effects low teacher expectations and limited resources of secondary schools have on academically preparing first-generation college students. The pre-attrition nature of the study allowed for gaps between the secondary and post-secondary curricula to be narrated in great detail. Like Warburton et al., Engle et al. reported the importance of rigorous coursework, especially
in math, but went further in noting the limited availability of rigorous courses in many secondary districts which potential first-generation college student attend. This paradoxical relationship perfectly highlights an opportunity to support first-generation college students through counseling and expanded curricula at the secondary level or planned remediation at the post-secondary level. Further, Engle et al. highlighted the lack of parental knowledge of the college admissions process, and acknowledged that first-generation college students are at a disadvantage not only academically, but in negotiating the administrative processes of transitioning from high school to college.

Themes in popular studies began to coalesce into a chronological story of pre-entry attributes, challenges while active in the academy, and correlated outcomes. Warburton et al. (2001) provided very informative correlations of first-generation college student status and factors influencing academic success. Engle et al. (2006) concurred with many of Warburton et al.’s academic correlations and provided insights from a pre-attrition perspective and student narratives. Reid and Moore (2008) further explored many challenges faced by academically-underprepared first-generation college students and continued to flesh-out the stories behind the statistics presented in previous studies.

Reid and Moore (2008) conducted a setting-specific study on first-generation college students who graduated from urban high schools to determine characteristics and challenges correlated with an urban setting. This report summarized key findings from interviews with first-generation college students and provided insights through the students’ own words. It should be noted the while insightful, the generalizability of the report may be limited by the sample size (13 urban students) and the information derived
is subject to educators’ interpretation of the students’ expressions. The narratives, however, provide great examples that bring statistical results to life.

Students in Reid and Moore’s (2008) study not only feel underprepared in subject matter, but feel behind in understanding the academic culture of the academy. One student in the 2008 study, for example, highlighted that she was not prepared for the freedom of college coursework. The student’s comments noted the importance of daily homework, one-on-one time with the teacher, regular papers and quizzes, and other regularly assigned learning exercises that are not present in many college courses. Concerning academic preparation, this student was not ready for the pedagogical changes that take place when matriculating. These students felt they lacked preparation in working with laboratories on projects such as dissections and working with educational technology. The students continued to cite time-management and study skills as major barriers. Although some conversations centered on subject matter preparation (typically in writing and advanced math), the most salient themes in this study were not subject specific. As such, academically supporting first-generation college students cannot stop with remedial coursework in mathematics and writing and efforts to supplement lacking academic preparation upon enrollment. It is critical that previous research on the academic outcomes of first-generation college students while pursuing a degree is examined to fully understand the academic challenges faced by this group.

**Persistence.** Much research has shown that first-generation college students’ academic struggles are present throughout their college careers (Chen, 2005; Coffman, 2011; Darling & Smith, 2007; Ishitani, 2003, 2006; Institute for Higher Education Policy,
Insufficient academic preparation is not often remediated by well-intended developmental courses and freshman seminars. Deficient understanding of subject matter, poor time-management skills, and underdeveloped study habits of first-generation college students prove burdensome and are consequently correlated with attrition (Chen, 2005; Clark & Cundiff, 2011; Ryan & Glenn, 2004). Below, an examination of literature exploring first-generation college student persistence and attrition is presented.

The discussion of persistence will begin with a high-level review of student departure theory as developed by Vincent Tinto (1975, 1987, 1988, 1993, 1997). While not focused on first-generation college students particularly, Tinto’s theory lays a foundation for understanding a widely adopted theory of student departure and helps organize influences from environments later discussed in the context of developmental ecology. In narrowing the focus of the review, Chen’s 2005 study is examined to illuminate quantitative results obtained from the study of first-generation college student outcomes concerning academic achievement in the academy. The 2005 study provides excellent insights into academic results and the environments that may influence these results. In continuing to narrow the focus to the topic of research at hand, this section details the findings of Ishitani’s 2006 study of first-generation college student departure. In this seminal piece, Ishitani provides a statistical analysis of first-generation college student outcomes and concludes that first-generation college students are indeed “at higher risk [than later-generation college students]” and are “less likely to complete their degree programs in a timely manner” (p. 880). While these authors are at the center of
this section of the review, research from varying perspectives are included to ensure an appropriate review of available literature and an informed discussion.

Any discussion about student persistence would be incomplete without an examination of Tinto’s theory of student departure (1987, 1993). While his theory is not without criticism (Braxton & Lein, 2000), Tinto’s theory serves as the basis for much scholarship on student persistence and has greatly influenced the study of student departure for decades (Renn & Reason, 2013). As noted above, Tinto’s theory was not developed specifically for first-generation college students, but the underpinnings of his model assisted in examining important factors in this study such as attributes of first-generation college students, development as a result of interactions with the university environment, and resulting academic outcomes.

Tinto’s theory of student departure attempts to conceptualize the student experiences over time, and how those experiences lead to continued enrollment or attrition. In his model of voluntary student departure, Tinto theorizes decisions and assessments made by students progressing through higher education (1987, 1993). Much like the discussion of first-generation college students, Tinto’s model acknowledges that students have individual attributes before entering the university setting that will affect the student’s experience in higher education. This acknowledgement is critical when studying groups with many attributes correlated with academic and social hardships such as first-generation college students. Tinto offers that students perpetually evaluate their fit with the university by assessing levels of academic and social integration (Tinto, 1987, 1993). In doing so, students assess items such as faculty relationships and academic
performance to gauge integration and examine relationships with peers, their sense of belonging, and interactions with student groups and organizations to measure social integration (Renn & Reason, 2013). As a result of this internal assessment of academic and social integration, Tinto suggests that students then reevaluate their initial goals and commitment to the institution in making a decision to remain enrolled or leave the institution.

Not only is Tinto’s theory of student departure and model of voluntary student departure requisite to any discussion of student persistence, the theory’s alignment with this study helped develop the lens through which we can analyze influences on first-generation college students. While the ability of Tinto’s model to explain the departure process of marginalized groups has been questioned (Tierney, 1999; Renn & Reason, 2013), the model does much to identify important factors that are of primary concern to this study.

Below, we examine persistence measures of first-generation college student performance relative to their later-generation college student peers, and how this study may assist models like Tinto’s in understanding environmental influences that perpetuate the academic struggles of first-generation college students.

In 2005 Xianglei Chen completed a study for the National Center for Education Statistics (NCES) that outlined persistence issues commonly correlated with first-generation college student status. In a culminating statement, Chen provided that 43% of the first-generation college students in the cohort studied left without a bachelor’s degree. In contrast, only 20% of later-generation college students in the same cohort left without
earning the same degree (Chen, 2005). Further, Chen reported that even high-math first-
generation college students were more likely than later-generation college students to
leave their institution without obtaining a degree and less likely to obtain a bachelor’s
degree at all. The results of this study also pointed to lower completion rates for students
in health and vocational training. This is of a concern for those supporting first-
generation college students as they have been found to maintain a utilitarian view of
higher education (Coffman, 2011). The report found that in addition to first-generation
college student status, SES, educational aspirations, institutional classification, delayed
enrollment, and course load all affected the academic outcomes and retention of students.
Remedial course taking was also correlated with lower levels of degree completion.

The report correlated long-term academic success with credit production and
strong academic performance in the first year, both of which are negatively correlated
with first-generation college student status (Chen, 2005). Further, Chen provided that the
low first-year GPAs of first-generation college students are not readily shed at the end of
their freshman coursework. By comparison, first-generation college students reported a
lower overall GPA that later-generation college students. Chen’s 2005 report provided
vast amounts of aggregate quantitative data which substantiates many often reported
academic issues affecting first-generation college student persistence.

While Chen (2005) reported objective measures of transcript data of first-
generation college students, many items presented can be further evaluated through a lens
of ecological systems theory, and present clear examples of voids this study addresses.
Like many reports similar to Chen’s, an analysis of influences which cause first-
generation college students to persist at lower levels the later-generation college students is outside the scope of the goals of the study. Inquiring about the causes of variances in the performance of first-generation college students and later-generation college students raises many questions that align with the research objectives of this study. For example, Chen points directly to first-year performance as a correlate with academic success. Further, Chen notes that first-generation college students struggle during this important period. When using an ecological development lens, one must note that this period of ecological transition is critical for cognitive development, and the introduction of new environments may create overwhelming dissonance for the developing student. Bronfenbrenner (1979) and Tinto (1987) both discuss the importance of successful ecological transitions, and the inequitable performance of first-generation college students during this transition mandates further exploration of influences created by the addition of a new proximal environment such as the university.

Ishitani (2002, 2006) has added greatly to the body of literature on first-generation college student attrition and has done much to detail the influences on, and experiences of, students in this population. His research on longitudinal trends of marginalized populations is prolific in studies of student success. Much of the author’s work involves studies of first-generation college students, and is well aligned with, and adds great value to, this study. The work of Ishitani has continuously shown that first-generation college student status is correlated with lower levels of academic achievement. In his 2003 study, Ishitani concluded that not only are first-generation college students less likely to graduate, but that the variances in survival rates are different at different
points in the students’ academic career, with the widest gap in persistence between first-
generation college student and later-generation college student occurring in the sixth
semester. One could draw from this conclusion that as environmental influences vary in
strength and direction, certain groups of students are unable to adequately buffer
dissonance from competing signals. In his 2006 study, Ishitani used statistical models to
illuminate patterns of first-generation college student attrition and persistence. The
findings of this study aligned with the findings of previous research in that first-
generation college students have lower completion rates as compared to their later-
generation college student counterparts (Bowen et al., 2009; Strayhorn, 2006; Warburton
et al., 2001). The 2006 study cited delayed matriculation, low SES, educational
expectations, and previous academic performance as influences on lower rate of
persistence.

Not only are these common attributes associated with first-generation college
student status, but many of these characteristics arguably alter the influences students
perceive from proximal environments in which they operate. As such, influences from
environments of first-generation college students may differ from the influences of
signals received by later-generation college students. Alternatively stated, environments
created by these characteristics, more likely portrayed by first-generation college
students, may create unbuffered dissonance not experienced by later-generation college
students. Thus, not only may first-generation college student status be directly related to
lower GPAs, but variances in support from environments in which first-generation
college students operate may influence students’ GPAs as well.
Social integration. Many students have trouble assimilating into the social milieu of the university and overcoming the academic challenges of university coursework. Students who are the first in their family to attend college however, often have less social interaction and lack meaningful relationships with faculty members (Pike & Kuh, 2005). Both of these activities have been correlated with academic success (Tinto, 1988). This may be partially driven by first-generation college students’ inability to fully leave one environment and commit to, and integrate into, the university setting. One of the most salient themes of the first-generation college student research is that first-generation college students are more vulnerable than other groups to experience non-academic hardships that inhibit social integration into in the academy. Bradbury and Mather (2009), Coffman (2011) and Pascarella, Peirson, Wolniak, and Terenzini (2004) and other researchers have provided insights into supporting first-generation college students by publishing social needs, issues inhibiting integration, and social challenges captured in the students’ own words. Bradbury and Mather highlighted obstacles faced by first-generation college students attempting to navigate the complex social landscape of the university setting in Appalachia Ohio while remaining connected to past environments. Coffman posits that challenges faced by first-generation college students are exacerbated by low educational aspirations, lacking familial support, a utilitarian view of a college education, and the need for strong social support. Coffman found many instances in which previous research was solidified through interviews and dialog. Pascarella et al. provided quantitative detail which illustrates the magnitude of many issues presented by
Bradbury and Mather and Coffman in a multi-university study of first-generation college students.

When appropriately buffered, the ecological transition from home to campus may prompt self-exploration, commitment to values, and healthy development (Bronfenbrenner, 1979). However, Bradbury and Mather (2009) describe a “pull of home” (p. 265) resulting from dissonance between first-generation college students’ efforts to engage in higher education and the strong ties to the community to which they were once fully committed. This pull is so strong for many first-generation college students that it may determine where they matriculate and if they live on or off campus (Bradbury & Mather, 2009). However, students may be in peril if the pull of home is significantly more powerful than the commitment to educational goals. Students not transitioning well into the campus culture due to such conflicting signals may feel as if they are abandoning their family (Bradbury & Mather, 2009), may feel like an imposter (Langford & Clance, 1993), and may fail to successfully integrate socially (Tinto, 1988).

The importance of addressing these issues with first-generation college students cannot be overstated, as these struggles may not be as salient to faculty and advisors, and may manifest in the student discontinuing enrollment to assuage overwhelming dissonance between the past and current environments (Tinto, 1988). In addition to the pull of home, first-generation college students in the Bradbury and Mather’s 2009 study shared concerns of successfully making an “academic adjustment” (p. 268) noting that academic engagement, relationships with faculty, and motivation to attend college all played critical roles in persisting. The students interviewed also shared a needed sense of
“belonging” (p. 270) in addition to purely academic relationships. Tinto (1988) noted the importance of such integration when discussing factors influencing persistence. Lastly, the first-generation college students interviewed by Bradbury and Mather shared the ominous concern of “financial realities” (p.272) such as future debt, college funding, and the intimidating process of using financial aid that served as constant stressors which may inhibit the integration process.

Bradbury and Mather (2009) posit that while the pull of home may be an obvious barrier to social integration, the academic adjustment, need for belonging, and financial realities can be serious deterrents to social integration as well. Consider, for example, the heightened level of integration felt by the first-generation college students when building relationships with faculty. A mentorship relationship with a faculty member can be more than an academic exercise. The acceptance of the student by the faculty member could represent the acceptance into the university setting and feeling of worth to many first-generation college students. Similarly, students seeking “belonging” in the university may be precluded from doing so by dissonant signals from lacking support from important environments, especially those such as full-time work environments, family responsibilities, and other influences that are created by, or are created in response to, the financial realities reported by students in this study.

In his 2011 article Coffman described key influences that can serve as focal points for the study of social support required and received by first-generation college students. A thorough understanding of these social factors allows for a more nuanced view of dissonant signals from environments in which first-generation college students operate.
Coffman sought to “decrease marginalization” and “strengthen…social networks” (p. 88) to assist in counteracting negative social constructs affecting first-generation college students by expanding on the knowledge required to foster a meaningful and successful college experience for students in this group. Socioeconomic status was found to influence support networks and persistence (Coffman, 2011). The author described research that correlated the commonly low SES of first-generation college students with reduced access to resources and increased marginalization on college campuses (Smith, 2008).

Coffman (2011) noted two key points which further illuminate the lacking social support felt by first-generation college students and influences which perpetuate successful integration into an academic setting. First, the need of a social network to support the first-generation college students is reiterated and its importance emphasized. As mentioned above, however, low-SES students, thus many first-generation college students, are unlikely to find such support. Second, Coffman noted the increased levels of social support received by students whose parents are involved in the educational process. This is a perfect example of proximal environments providing support and mitigating dissonance. Unfortunately, many first-generation college students may construct and maintain a negative view of higher education as a result of lacking academic and social support. Careful consideration must be given to the conflicting relationship between the increased needs of first-generation college students and the low levels of access, preparation, and support outlined by Coffman (2011).
A review of the findings of Terenzini et al. (1994) adds value to Coffman’s study by describing the high level of influence family background has on educational aspirations. It is important to remain cognizant that first-generation college students are by many definitions the first person in their family to attend any form of higher education. Imagine then, the role family background plays in constructing the first-generation college students’ view of the college experience, and the influence felt from this important (albeit often misinformed) perception. The immediate family’s lack of education may perpetuate a decreased appreciation of higher education, thus contributing to the construction of lower educational aspirations.

Pascarella et al. (2004) did much to further educators’ knowledge of this high-risk group in a landmark study quantifying the effects of non-academic challenges of first-generation college students in 18 universities. In a statement recapitulating a review of first-generation college student data, Pascarella et al. suggests that first-generation college students face heightened barriers compared to later-generation college student in terms of SES, diminished familial support, lower educational aspirations, and deficient knowledge of university functions. The 2004 report states that first-generation college students often have “substantial cultural as well as social and academic transitions” (p.250) in additional to the “anxieties, dislocations, and difficulties” (p.250) many college students encounter. Pascarella et al. correlates the challenges above with the inability to live on campus, participate in extra- and co-curricular activities, engage academically, and otherwise fully participate in educational pursuits. This finding is notable, as these activities were found to increase satisfaction, increase educational aspirations, and
increase academic confidence. Identifying and ameliorating the academic and psychosocial challenges that inhibit first-generation college students from engaging in activities that are most beneficial to their success should be a target of programs aimed at supporting this group.

Bradbury and Mather (2006), Coffman (2011), and Pascarella et al. (2004) provided valuable stories that illuminate challenges faced by first-generation college students attempting to integrate into the university setting. Previous research covering the non-academic inhibitors of first-generation college student success allows an appreciation for each individual behind the outcomes often aggregated and studied en masse. Statistical figures, culminating outcomes, and numerical data are well augmented by individual stories and first-person accounts that allow educators to refocus on individual first-generation college student success through empathy and personalized efforts. Further, these reports provide illustrations of the importance of academic and social support for first-generation college students.

**Connecting Attributes to Outcomes**

In the final section of the literature review, possible connections between the independent and dependent variables are explored as the research examined becomes more aligned with the goals of this research. First-generation college student status and the influences created by common attributes of this group are discussed in the context of academic hardships through a discussion of themes in first-generation college student literature. To begin, an analysis of popularly referenced issues in first-generation college student research is presented. While these issues are presented separately from literature
using developmental ecology to explain influences experienced by first-generation college students, they are not to be considered mutually exclusive in providing explanations of struggles for students who are the first in their family to attend college. An understanding of the concepts presented will help narrow the review to the primary focus of this study. In the concluding discussion of this section, an analysis of literature that closely aligns with the research objectives of the current study is presented. This final review of a very pointed body of scholarship will examine the use of ecological systems theory in support of underrepresented groups in the higher education environment, and will set the stage to discuss the gaps in research the this study addresses.

**Thematic Concepts in Literature**

It is important to acknowledge that the no single theory can be used as a perfect mechanism to explain or predict academic performance. Researchers and educators must use the vast knowledge in the study of student development to support students in the higher education system. While the overarching focus of this study will center on the use of ecological systems theory to try to connect first-generation college students’ academic performance to varying levels of academic and social support from the environments in which they operate, several different concepts have been used to help researchers and educators understand challenges faced by first-generation college students. As discussed in the introduction to this section, these concepts are not considered alternate or deficient means through which the experience of first-generation college students in higher education can be explained. Conversely, they add to the depth of discussion of
developmental effects of academic and social support from environments and in some cases are a result of, or even create, environmental influences. These thematic concepts are strongly interrelated and interdependent with influences from proximal processes in which students operate.

**Self-authorship.** The discussion below is an examination of the fundamental underpinnings of Baxter Magolda’s theory of self-authorship and how this theory can be used to better understand the developmental challenges first-generation college students may face. Baxter-Magolda’s longitudinal study of cognitive, interpersonal, and intrapersonal development is one of the longest running studies in the field of student development and is informative in that it provides insight not only into the developmental paths of students while in college, but follows them through their lives as young adults and working professionals (Renn & Reason, 2013). Using Kegan’s concept of self-authorship as a theoretical perspective, Baxter-Magolda’s study sought to explore three primary aspects of development. The study follows participants as they navigate how they know (epistemological; cognitive perspective), who they are (finding one’s self and his or her beliefs; intrapersonal perspective), and how they want to relate to others (how relationships will be constructed; interpersonal perspective) (Evans, Forney, Guido, Patton, & Renn, 2010).

Baxter Magolda posits that students move through four key phases on their developmental path to self-authorship (Evans et al., 2010). In the first phase, Following Formulas, Baxter-Magolda described young adults as seeking approval and allowing external forces to define their lives by following the plans that others have constructed for
them (Evans et al., 2010). When meeting a Crossroads and entering the second phase, young adults become dissatisfied with having their lives defined by the approval of others and feel a need to act more authentically (Evans et al., 2010). It is this second phase that is often instigated by crisis, such as acknowledging that previously used formulas may not fit the young adult’s newly constructed view of “who they are” or a more complex worldview. In the third phase, in which the young adult is Becoming the Author of One’s Own Life, young adults begin to choose and defend belief systems that better define their newly-constructed self (Evans et al., 2010). In the final phase, Internal Foundation, young adults have a “self-determined belief system,” a “solid sense of identity and values,” and “truly mutual relationships” (Renn & Reason, 2013, p. 121). This is the endpoint of Baxter Magolda’s path to self-authorship. It is at this point, that Baxter-Magolda posits that subjects enter into adulthood.

Although the homogeneity of the sample in Baxter-Magolda’s study may limit generalizability, Renn and Reason (2013) provide the many researchers are starting to apply the concept of self-authorship in the study of marginalized groups such as first-generation college students. Notably, Janet Pizzolato (2003) is a widely published researcher studying the concept of self-authorship in the context of high-risk students, many of whom are first-generation college students. Interestingly, research provides that student characteristics can be linked to the path to self-authorship that students experience (Wawrzynski & Pizzolato, 2006). Pizzolato (2003) found that high-risk students, including those with first-generation college student status, may have experienced dissonance, exploration, and maturing earlier in life than those from a more
privileged background. As such, first-generation college students may be further on the path to self-authorship than their later-generation college student peers when entering the college environment.

In her later work, however, Pizzolato (2004) found that even though first-generation college students may enter the academy closer to self-authorship than their peers, this advancement is temporary as new complexities and ways of meaning making introduced by matriculating may lead to overwhelming dissonance, lacking confidence, and regression. Even though these students may be closer to self-authorship initially, they still require support and would greatly benefit from the guided meaning making Baxter-Magolda notes in her research. Supporting these students through the complexities of regressing through stages of self-authorship, pluralistic thinking, contextual knowing, and the renegotiating relationships could be the buffering required to put first-generation college students back on the path to self-authorship.

**Deficient cultural capital.** Cultural capital is a major construct in the higher education experience of college students and can affect academic outcomes and the process of integrating into the university (Ward et al., 2012). This construct tenably affects first-generation college students relative to later-generation college students in an inequitably negative manner based on the inability of many parents of first-generation college students to pass on fundamental knowledge to their children who are entering the university setting (Collier & Morgan, 2007; Oldfield, 2007; Ward et al., 2012). This is a fitting use for this theory, as cultural capital was first used in the context of higher education to analyze experiences of students from varying social classes in the study of
cultural and social reproduction (Bourdieu, 1973). Cultural capital is not simply a barrier for first-generation college students, but may also further demarcate the academic performance of first-generation college students and later-generation college students by increasing the likelihood of success for students whose parents have attended college and can share experiences, knowledge, and resources with their children (Dumais & Ward, 2010).

As discussed by Ward et al. (2012), it is important to delineate the differences between parental support and cultural capital. Many parents of first-generation college students want their children to be successful in higher education, as research on parental support has shown mixed results with only moderate differences between later- and first-generation college students’ perceptions of parental support (Barry, Hudely, Su-Je, & Kelly, 2008). What makes cultural capital such an effective proponent of inequitable outcomes of students whose parents have attended college and those who have not is that the parents of first-generation college students cannot, to be clearly differentiated from will not, share knowledge of university language, customs, rituals, resources, and other information that would likely increase their child’s chances of success (Barry et al., 2008).

From the lens of developmental ecology, this ecological transition into the university setting is much different for first-generation college students than their later-generation college student peers. First-generation college students enter the university setting with a heightened level of stress as the interactions with new proximal environments begin to influence the students through the dissonance and conflict of the
ecological transition. Further, the creation of this new environment begins to become interrelated with existing microsystems which can compound the influences experienced by the student. For the first-generation college students, the lack of cultural capital and its ability to assist in navigating the university landscape academically and socially may create overwhelming dissonance and inhibit development. Students who enter the university environment with adequate cultural capital may feel the inverse of the influences on first-generation college students as cultural capital may allow for the new environment to be perceived as welcoming and more easily navigable. For later-generation college students, the ecological transition will still create dissonance; however, the dissonance may be more manageable, create synergy with existing microsystems such as family interactions, and create an opportunity for healthy development. As with many concepts in this section, the differences between the experiences of the two groups of students are clear. Below, we discuss the effects of anticipatory socialization and how it can hinder the success of first-generation college students.

**Anticipatory socialization.** While similar in some aspects to cultural capital theory, another phenomenon that has been used to relate student characteristics such as parental education to academic outcomes and social integration is the concept of anticipatory socialization (Latham, 2004; Pascarella, Trerenzini, & Wolfe, 1986). A concept long used by social scientists in many different fields, O’Kane, Barenblatt, Jensen, & Cochran (1977) provide that anticipatory socialization implies that “[an] individual uses as a reference group another group to which they aspire, and socialize
themselves towards this group’s perceived norms, values and beliefs, before they actually attain membership” (p. 69). In a more recent study applying the concept to higher education, Latham (2004) writes the concept “describes the process by which individuals identify a group [to which] they aim to belong and socialize themselves according to that group’s norms” (p. 17). There is a critical nuance in O’Kane et al.’s definition that is the crux of this concept’s use in the study of first-generation college students, which clearly points to perceived norms, values, and beliefs. Inaccurate anticipatory socialization can inhibit a smooth transition and drastically affect the developmental progress of a student entering and socializing into the actual university environment.

The use of anticipatory socialization to examine potential connections between first-generation college student status, the environments in which they operate (including ecological transitions), and academic performance has been used by notable authors in the field of first-generation college student development (Coffman, 2011; Pascarella et al., 1986; Pike & Kuh, 2005; Ward et al., 2012). Additionally, this concept overlaps, informs, and is informed by the widely used transition theory as presented by Schlossberg (1981).

When aligning anticipatory socialization with developmental ecology in the context of first-generation college students and how this concept can be related to academic performance, consider the importance of the perceived norms and how students may, or may not, have access to develop accurate pictures of these norms. Students without access to these norms may inaccurately define the culture of the anticipated groups, and create incremental dissonance in addition to the stress inherent in the
transition (Evans et al., 2010; Schlossberg, 1981; Pascarella et al., 1986). If inaccurate anticipatory socialization occurs, the additional dissonance could inhibit socialization into the actual environment and create negative influences between the perceived environment and the actual university environment.

**Developing racial identity.** First-generation college students are much more likely than their later-generation peers to report a race/ethnicity other than White (Chen, 2005). Depending on the operationalized definition of first-generation, as much as 36% of students in this group report a race/ethnicity of American Indian, Asian/Pacific Islander, Black, or Hispanic (Chen, 2005). Over the same period, only 16% of students whose parents had at least a bachelor’s degree reported identifying with one of the above races/ethnicities (Chen, 2005). These findings show that first-generation college students are more than twice as likely as their later-generation peers to identify as a minority. Given the representation of minority students, the development of racial identity, and the role it plays in the development of a college student must be acknowledged.

Phinney (1996) worked with adolescent children and young adults to develop a three stage model to examine students’ development of ethnic identity. Phinney’s model aligned closely with that of Marcia’s model of identity development, but was particularly focused on ethnic identity (Renn & Reason, 2013). Phinney posited that students are first unaware of their ethnic identity and that exploration of ethnic identity is a result of an event, or non-event, which makes their ethnic identity more salient. After encountering
and exploring their ethnic identity, the model posits that students may achieve their ethnic identity and successfully operate in a multicultural society.

The work of Cross has influenced ethnic identity development research for many years (Renn & Reason, 2013). Cross’s model specifically focused on the identity development of Black individuals. Cross posits that Black identity is realized through a five-stage process consisting of pre-encounter, encounter, immersion/emersion, internalization, and internalization-commitment. Cross’s model highlights that as Black individuals explore their ethnic identity, they enter a highly emotional stage of immersion, in which everything in their lives is centered on their ethnicity, and then emersion, during which individuals may find security and a new sense of self.

A key factor in both Cross’s and Phinney’s models centers on a change in the person’s life which makes them more aware of their ethnic identity and incongruences or inequalities in the world that surrounds them. The exploration period that follows the pre-encounter stages can be emotional and volatile. Although positive growth and development may result from encounter and exploration, racism, emotional distress, and self-doubt may burden developing individuals during these stages of development. When considering the likelihood of first-generation college students identifying as a minority, researchers and advocates must consider how the developmental effects of ethnic identity development can affect students’ commitment to academic success in higher education.

**Undermatching.** Another concept that appears across research of first-generation college students, and especially those of a low SES, is undermatching. The concept of undermatching holds that students benefit in terms of likelihood of graduating by
attending the most highly selective institution to which they are accepted (Bowen et al., 2009; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009). Recently, it has been reported that institutional selectivity not only has an effect on completion, but is correlated with higher salaries after graduation (Ma & Savas, 2013). The theory of undermatching initially appeared in literature through studies conducted by the Consortium on Chicago School Research at the University of Chicago examining factors of college readiness and success in the Chicago Public School District. In 2009, Bowen, Chingos, and McPherson tested the theory using larger datasets and provided a more detailed description of the negative academic outcomes with which undermatching was associated. Both authors related undermatching, which is associated with academic hardships and lower success rates, to parental education among other variables. Based on these widely acclaimed studies, first-generation college students are more likely to undermatch when selecting a college and may face inequitable challenges in performance by doing so.

It is important to not only define the concept of undermatching, but to understand how attending less selective institutions may negatively affect academic performance of first-generation college students. As students enter institutions, they may take on many of the cultural norms of the new environment. Selective institutions may do much to influence students’ academic performance by fostering an environment of success that is academically challenging, socially supportive, and provides the resources needed by students. In short, students are more likely to be successful in university environments that promote success.
To conclude the discussion of undermatching, it is important that two further items are addressed. The authors take care to clearly articulate that not every student should attend the most selective university to which they are accepted. Bowen et al. (2009) warn that undermatch should not have a “normative connotation” (p. 100) and that many valid reasons exist for students to choose universities other than the most selective. In both studies published on the subject, Roderick et al. (2008, 2009) comment that college match, albeit important, is only one of many factors to consider when choosing a college. Second, there have been challenges to the research methods used to explore undermatching and its effect on academic success. Most notably, Bastedo and Flaster (2014) critiqued the study for overstating the importance of undermatching and overstating the ability of researchers to accurately predict enrollment patterns of the high-achieving, low-income, and often first-generation students. As mentioned above, the national popularity of the undermatching concept is relatively new, and Bastedo and Flaster admit there is inequity, but have concerns about the methods of research. However, many well-respected researchers in the discipline of higher education have supported the theory of undermatching, and agree that it is a critical issue in equality and social mobility and defend the works of authors mentioned in this literature review (Jaschik, 2014). As such, this research subscribes to the importance and urgency of undermatching as a barrier to first-generation college student success.

As noted in the introduction to this section, the above concepts of self-authorship, cultural capital, anticipatory socialization, developing a racial identity, and undermatching are not to be viewed as counterpoints to the following discussion which
examines the use of ecological systems theory to help explain the academic performance of first-generation college students. The prominence of these concepts merits their discussion to ensure a complete review of important first-generation college student literature and to help situate the use of developmental ecology, and more specifically, ecological systems theory in understanding challenges students face. The concepts of self-authorship, cultural capital, anticipatory socialization, developing a racial identity, and undermatching are strongly interconnected with ecological systems theory and are considered parallel theories of equal importance. That withstanding, there is a notable dearth of scholarly literature employing developmental ecology to explain academic performance of first-generation college students. This void becomes even more conspicuous when seeking literature using quantitative data through an ecological systems lens to study this marginalized group. Below, a review of works in the field of developmental ecology, specific to supporting college students from underrepresented groups is presented to better frame the need for this study, and how it adds to the current body of knowledge.

Developmental Ecology and First-Generation College Students

In this final section of the literature review, the body of research informing and aligning with the research objectives of this study is further refined and examined. The studies in this section of the literature review are those that most align with the purpose and theoretical perspective of this study. The preceding examination of literature studying first-generation college student characteristics, academic outcomes, social integration, and thematic concepts posited to affect this group all provide the foundation for this very
pointed review of studies that attempt to explain student outcomes through ecological studies. The studies examined below give insight into how developmental ecology, and more pointedly ecological systems theory, can serve to explain the challenges students face, and how influences from proximal processes can affect student development and success in higher education.

It is important to note the contrast between the studies presented below, which use developmental ecology as a theoretical underpinning, with the use of a developmental ecology perspective which was applied to examine the research above. Because of the nature of this study, the literature reviewed above was described and analyzed through the lens of developmental ecology with a focus on support and academic outcomes. The perspective of developmental ecology was intentionally applied to interpret results provided by many varying theoretical perspectives and methods of research to better connect the current body of literature to the study at hand. Conversely, the works reviewed below use developmental ecology directly to heavily inform the research questions and methods of each piece of research. This distinction is important for two primary reasons. Initially, it is necessary to show that there is a paucity of research using developmental ecology as a theoretical perspective to explain academic performance, and especially so for first-generation college student specifically. Additionally, an understanding of the few studies that exist helps illuminate the unique aspects of this study of environmental influences on first-generation college students and show the value this study adds to the very narrow body of research that currently available.
**The introduction of campus ecology.** In their 1974 article, Banning and Kaiser provide one of the earliest applications of an ecological perspective in higher education research. In a study funded by the Western Interstate Commission for Higher Education, the authors apply principles from Blocher’s (1974) ecological perspective of elementary school settings to university campus design. In doing so, Banning and Kaiser clearly delineate key points of an ecosystem, as it pertains to campus environments and college student development, and situate the theory of an “ecosystem model” and an “ecological perspective” (p. 372) among popularly used theories in student affairs. Without using the terminology popularized by Bronfenbrenner five years later, the authors point out the importance of the interrelations which create mesosystems, the critical need for understanding the relationship between the college student and the environments in which they operate, and how development and academic outcomes can be affected by this relationship. The authors eloquently describe the goal of the ecosystem model as “design[ing] environments in which the transactions between the student and environment will foster optimum educational growth and development” (Banning & Kaiser, 1974, p. 372).

The alignment of this article’s key points and this study’s emphasis on environmental influences make Banning and Kaiser’s (1974) publication an important piece of this literature review. The 1974 article discounts “unenlightened,” “counseling,” and “developmental” families of student development theory by describing them as “one-sided” in that they ignore the effects of the interactions between the student and proximal environments and only consider how the student must adjust to the environment to be
successful (p. 371). The authors’ pointed critique of alternative theories and detailed attention to the interrelations between students and the microsystem of the campus bespeak important role of ecological systems theory throughout the history student development research in higher education.

The remainder of the article focuses on using an ecosystem model to design, or redesign, a campus environment that would foster developmental opportunities by acknowledging influences on students from interactions between students and environments. In a very progressive statement for its time, the 1974 article commits one of three major pillars in the ecological system model to designing environments that address “the congruities and incongruities that specific groups are experiencing with their environments” (Banning & Kaiser, p. 374). The specific groups to which they are referring include “any number of characteristics” but “ethnic origins” and “special interest patterns” are specifically stated (p. 374).

As can be seen, Banning and Kaiser’s (1974) description of an ecological systems model aligns with using academic and social support systems to evaluate influences on first-generation college students. Although greatly aligned with the theory presented by Banning and Kaiser, the research in this study furthers the sentiment of their study in two primary ways. Unlike Banning and Kaiser’s article, this study used quantitative data to examine actual levels of academic and social support students receive. This empirical study adds great value to further understanding the level of academic and social support from environments and relationships that may exist between academic and social support and students’ GPA. Further, this study explored environmental influence at a more
granular level: the focus is on a single group of students and a given set of environments in which they likely operate. Banning and Kaiser provided that experiences and environments will vary for certain groups, but fall short in evaluating the accuracy of these statements and magnitude of the influence on these groups.

**Developmental ecology in practice.** The use of developmental ecology has not only been applied to the planning of physical environments, but also to inform other functions supporting students. In 2011, Stebleton published a study that used a developmental ecology framework to advance academic advising practices when working with immigrant college students. The inclusion of this article in the literature review shows the focus of literature further narrowing towards the research objectives for the study at hand. Very similar to the objectives this study, Stebleton used developmental ecology, and Bronfenbrenner’s ecological systems framework specifically, to better understand environmental influences on a particular population. The similarities between Stebleton’s article and this study do much to situate this study of first-generation college students in the body of literature. Stebleton’s 2011 study provided detailed insights into characteristics of a particular population, current terms used to describe and define the group, the importance of relationships on campus, and how ecological systems theory can be used to understand and support this population. The author used developmental ecology as a method of informing academic advisors of another option to better understand the students with whom they work and provides practical applications of ecological systems theory in practice.
Stebleton (2011) presented enhancements to interactions with immigrant students in a manner specifically geared toward academic advisors that interact directly with members of this group. In a novel recommendation for advisors, Stebleton suggests that students’ understandings of influences in their lives may be enhanced with a visual representation of potential ecological systems influencing their development and presents a graphical example of influences based on ecological systems theory. The article suggests that advisors not only understand the ecological influences on immigrant students’ developmental path, but attempts to connect university resources to negative influences which can help mitigate dissonance and foster healthy development. Further suggested practices include professional development for advisors and university representatives interacting directly with students, the creation of peer groups, and increases in the use of technology. The suggested practices all tie ecological systems theory to understanding student influences and suggest ways in which conflicting signals among influences can be mitigated to prevent overwhelming dissonance and create a developmental opportunity for immigrant students. The suggested practices are applicable and informed by literature, but the study does not present original findings as no empirical research was conducted.

There are many similarities in the research objectives of Stebleton’s work and the study at hand. Stebleton (2011) and this study both used Bronfenbrenner’s (1979) ecological systems model to understand environmental influences on a marginalized population. Further, both studies not only advance the scholarly body of knowledge on ecological systems theory and its use in supporting underrepresented students, but both
studies also tie research to practical application. There are, however, key differences that illuminate gaps in ecological systems theory literature this research addresses.

Stebleton’s (2011) work does much to tie the characteristics of immigrant students to environmental influences. While ecological systems theory appears to be an accurate model to organize influences on immigrant students, Stebleton stops short of testing this empirically. Stebleton’s study is well-informed by literature, but large, although tenable, assumptions are made when using ecological systems theory to define influences of immigrant students without primary data from the students. This research addressed this by not only applying an ecological systems model to known characteristics of first-generation college students as described earlier, but also used quantitative data collected directly from students to inform the analysis of environmental influences. The use of empirical data is not often seen in research of ecological systems theory and will do much to ensure assumptions such as those made in Stebleton’s work are accurate. Below, we review a study which presents the rare combination of quantitative methods and ecological systems theory in support of another marginalized group.

An ecological perspective of minority first-generation college students. In a study which greatly aligns with the research objectives, research approach, theoretical framework, and fundamental cause of the study at hand, Dennis, Phinney, and Chuateco (2005) study the ability of motivation and social support factors to predict academic performance of ethnic minority first-generation college students. This longitudinal quantitative study analyzed self-reported and university data of 100 ethnic minority students in an urban university. As stated by the authors, the study “takes[s] an ecological
perspective and include[s] aspects of the person and the environment” (Dennis et al., 2005, p. 224). The study explored relationships among background variables such as ethnicity, SES, and gender; personal motivators such as family expectation motivation and personal/career motivation; and environmental support such as family support available and needed and peer support available and needed. The authors sought to predict outcomes of GPA, college adjustment, and commitment to college by using correlation measures and regression analysis.

The results of the study provide both expected and surprising results (Dennis et al., 2005). The authors hypothesized that both family expectation motivation and personal career motivation would be related to outcomes. In partially confirming this hypothesis, the data show that while personal/career motivation could predict outcomes, even while controlling for other variables, family expectation motivation was not related to outcomes in a statistically significant manner with or without controlling for background variables. In the context of social support, which more directly ties the ecological framework of Dennis et al. (2005) and this study, Dennis et al. found that lacking needed support (i.e., the support needed is perceived to be not available) was predictive of college outcomes. Interestingly, it was the measure of peer resources needed that remained significantly related to outcomes when controlling for all other variables. This finding points to the importance of the campus environment, and the important role it plays in the development and success of ethnic minority first-generation college students by creating dissonance and providing resources and positive environments to mitigate dissonance to provide a healthy developmental experience.
Two additional findings inferred from the statistical analysis were notable. First, the regression analysis failed to reject the hypothesis that first-generation college students look to their peers more than their family for support (Dennis et al., 2005). This point underscores the importance of fostering relationships and the role of social integration in success of first-generation college students. Further, the data show that students’ perceptions of support available and support needed are not strongly correlated and that the perceived lack of support is a much stronger predictor of outcomes (Dennis et al., 2005). This too connects the environments, as perceived as supportive or not, to outcomes.

There are many characteristics of Dennis et al. (2005) that align with the current study. Most notably, Dennis et al. (2005) is one of the few studies available that combine quantitative research methods and an ecological systems approach to better understand outcomes of a given population. The 2005 study, like the current study, used methods such as student surveys, pilot testing, and statistical models to analyze data of student perceptions and possible connections to student outcomes. In addition to the methods used to collect data and measure relationships, Dennis et al., aligns greatly with this research in the overarching framework of using Bronfenbrenner’s ecological systems theory (1979) to illuminate environmental influences on a marginalized group. However, there is one critical difference between the current and the 2005 study that highlights how this study adds to the body of knowledge and is a valuable contribution to scholarly literature on ecological systems theory and first-generation college students.
The most salient difference between Dennis et al. (2005) and the current study is the inclusion of all first-generation college students. According to (Chen, 2005) a large percentage of first-generation college students identify as White or Black. Dennis et al. used a small and highly-refined sample consisting of only Latino and Asian first-generation college students severely limited generalizability to the larger population. Further, the focus of Dennis et al. was on predictive power of a given number of independent variables.

**Addressing the Gap in Previous Research**

The literature review above was designed to describe key themes and seminal works that situate and inform this study. Previous research was presented in a manner which addressed the broadest discussions first, such as the overview of first-generation college students’ characteristics and demographic information from national studies. The research reviewed then narrowed in focus to present studies of academic performance and social integration, followed by a review of thematic concepts found in literature which attempt to explain outcomes of first-generation college students. These first three sections align with the independent variables, dependent variables, and concepts aiming to connect the variables, respectively. In the final section, only studies that greatly align with the study at hand were presented. The methods and findings of these studies situate the study at hand in the body of knowledge and clearly show how this study will advance the body of knowledge in this discipline.

As seen in the first section, first-generation college student status is associated with many other characteristics that have been associated with academic difficulties and
lower levels of social integration. Among others, these characteristics often include identifying as an ethnic minority, being of a low SES, working full time, having irregular enrollment spells, and having families (Bui, 2002; Engle et al., 2006, Saenz et al., 2007; Warburton et al., 2001; Ward et al., 2012). These characteristics are important to the use of ecological systems theory in this study, as many create microsystems which provide varying levels of academic and social support. As the presentation of germane research continued, the focus shifted to academic performance and social integration. It is in this second section that research examining indicators of academic performance such as GPAs, persistence, integration with campus resources, and other outcomes clearly showed that first-generation college students have relatively lower levels of academic success than their later-generation college student peers (Bradbury & Mather, 2009; Chen, 2005; Coffman, 2011; Ishitani, 2003; Pike & Kuh, 2005; Reid & Moore, 2008; Warburton et al., 2001).

The penultimate section of the literature review examined concepts which aim to explain relationships between student characteristics and student outcomes. Concepts of self-authorship, deficient cultural capital, anticipatory socialization, developing a racial identity, and undermatching were reviewed to connect the variables and explain why first-generation college students have reduced success. In the final section, three studies which align with the concepts of this research were presented. These studies use an ecological systems approach to understand learning, development, and academic performance. The three studies focused on campus ecology as an environmental planning tool, using developmental ecology to advise immigrant students, and using ecological
systems theory to gain perspective on the experiences and outcomes of ethnic minority first-generation college students.

Although research correlating first-generation college student status with barriers to academic success exists, there is still a need in scholarly dialog for a deeper understanding of potential relationships between first-generation college student status, academic and social support, and academic performance. This gap in research is even more salient when searching for empirical findings to describe these relationships. To date, Dennis et al. (2005) appears to be the only study which uses similar methods to measure first-generation college students’ influences through the lens of ecological systems theory. As noted above, the report can be augmented by more robust sampling and more generalizability to students of varying ethnicities.

The call for more research aimed at advancing the knowledge of ecological systems influencing marginalized students is noted in the current body of literature. At the conclusion of their study, Dennis et al. (2005) illuminate this need by noting that “future studies from an ecological perspective must move beyond investigating…personal characteristics and contextual supports and investigate the ways in which these interact with one another to influence the development of college students” (p. 235). In addition to Dennis et al.’s pointed call for additional study, the dearth of studies available on ecological development of first-generation college students is a reflection of the need for more work in the field.

This study addressed this gap in current research by deepening the understanding of environmental influences on first-generation college students by moving the analysis
from a student-attribute-level perspective to a multi-system, environmental-level lens. This is accomplished by using Bronfenbrenner’s (1979) ecological systems theory and the work of Kuh on student engagement to help explain relationships between academic performance as measured by GPA and varying levels of academic and social support as quantified by statistical analysis of survey results. To be sure, previous research identifying attributes of first-generation college students that make these individuals high-risk is useful and informative. The significance of this study, however, is its use of primary survey data to explore relationships among first-generation college student status, GPA, and academic and social support, and the use of quantitative data in conjunction with ecological systems theory to explain relationships that are found. Using ecological systems theory can help illuminate the need for academic and social support from proximal environments and illustrate how advocates for first-generation college students and other underrepresented groups can buffer dissonance from conflicting environments and improve academic performance. In the next section, the methods used to gather and analyze the data are reported in detail.
Chapter 3: Methods

This study examined the relationship among first-generation students’ academic and social support and academic performance. The construct of academic support was defined as involvement in activities the student perceives to promote successful academic performance. The construct of social support was defined as involvement in activities the student perceives to positively impact their social experience in college.

The questionnaire presented students with various activities and students provided data on how often they participate in the given activity and if they believe the activity promotes academic success or positively impacts their social experience in college. Examples of academic activities on the questionnaire include instruction, utilizing faculty availability, and making social contacts with faculty. Examples of social activities on the questionnaire include spending time with close friends, attending cultural events, and working on campus. All activities that represent academic and social support can be seen on the questionnaire. To better understand this relationship, this study explored differences in student attributes, academic performance, and academic and social support reported by first-generation college students as compared to their peers with at least one parent who has completed a bachelor’s degree.

Population

The population for this study consists of undergraduates at Ohio University who are in their sophomore year and enrolled at any physical campus during the Spring 2015-2016 semester. A detailed discussion of the inclusion criteria is provided below. Before
outlining the specific criteria of the target population, it is important that more information about the university which they attend is provided.

Ohio University’s main campus and seven of its regional campuses and centers are located in Southeastern Ohio. The university also has a center in Cleveland and one in Dublin. The university offers associate’s, bachelor’s, master’s, and doctoral degrees including a doctor of osteopathic medicine (OIR, 2014). According to the university’s website, the university has 11 colleges and offers more than 250 undergraduate majors. The Carnegie Foundation classifies the Athens (main) campus of Ohio University as a research university with high activity and the regional campuses are listed as public four-year primarily associate’s universities.

Total enrollment at Ohio University for the Fall 2013 semester was 38,857 (OIR, 2014). This included 22,657 students who attend the main campus in Athens, Ohio; 6,129 students who are online learners; and 10,071 students who attend one of the university’s regional campuses. According to the Ohio University Fact Book (2014) published by the Office of Institutional Research, the total undergraduate population of on-site students during the Fall 2013 semester was 27,446. Nearly two-thirds (17,375) of these students attended the Athens campus while the remaining students (10,071) were somewhat evenly distributed throughout the regional campus system. In total, more than 86% of the university’s students are undergraduates (OIR, 2014).

The campuses and centers that belong to the regional campus system include locations in Cambridge, Chillicothe, Eastern, Lancaster, Pickerington, Ironton, Proctorville, and Zanesville. According to the university’s website
(www.ohio.edu/regional), these locations do not offer student housing, offer mostly degrees that are career-focused, and only require a high-school diploma or General Education Diploma to enroll. As such, these locations were more likely than the Athens campus to enroll non-traditional and first-generation college students. The inclusion of the regional-campus students is critical to the diversity of the population. All 50 states are represented in the student body and there are 1,859 international students (OIR, 2014).

**Inclusion criteria.** The target population for this study included Ohio University students who

- were enrolled in any number of credit hours during the Spring 2015-2016 semester;
- have completed more than 30 semester hours but less than 60 credit hours at the start of the Spring 2015-2016 semester; and
- were registered at Ohio University as a campus-based student.

This research limited the study to only those students who are enrolled for two primary reasons. Students who were enrolled at the time of the survey were still living out the developmental experience of attending a university. Currently enrolled students still experiencing the varying levels of academic and social support could more accurately gauge the level of support provided by the environments they were still in. Input from students who are no longer enrolled may provide useful responses, but the scope of the study focused on the experiences of current students. Second, currently enrolled students were a more feasible group to study. Although feasibility should never be the single guide for choosing a population, it must be considered in the design (Light
et al., 1990). Enrolled students were still engaged at some level with the university, have active e-mail accounts, and are more accessible.

The spring semester was chosen as the appropriate time to administer the survey. Concerns about the summer and fall semesters are outlined below. The usefulness of the findings of this study depended on students’ ability to accurately gauge their levels of participation in academic and social activities and how this participation affected their experience. If surveyed in the fall semester—after many students are just returning from home after summer break—students ability to recall participation in activities and influences from such participation accurately may be limited because of the time passed during break. Administering the survey in the Spring gives the students a semester to resume participating in the academic and social environments and to receive grades that may be affected by the environments. By allowing the students to complete the fall semester before taking the survey, their ability to more accurately report on the variables of the study may be improved. The spring semester was considered a better choice than the summer semester as the decline in enrollment experienced in the summer may not provide an appropriate sample.

Sophomore students were chosen to be the “level” of students in the target population. Juniors and seniors have already survived the academic and social challenges of matriculating and, as a distinct group, may report disproportionate levels of support as a result of only surveying those who made it to their junior or senior year. The relationship among academic and social support and academic performance among juniors and seniors may be misinterpreted due to confounding variables. A relationship
among higher levels of academic and social support and higher academic performance may falsely appear as both independent and dependent variables could be affected by unknown influences that have helped junior and senior students advance through the first years of college.

Although the freshman class may provide the most, and most generalizable responses, concerns about the amount of unsystematic variance in the cumulative GPA of freshmen prohibited the selection of this group as the target population. The small number of credit hours completed by freshmen can allow for wide variance in the cumulative GPA as a result of the formula used to calculate cumulative GPAs. For example, the effect an extreme grade in a single class can have on the GPA of a freshman with only a few credit hours may show variance due only to the weight of that particular grade which cannot be disentangled from variance related to academic and social support. The use of sophomore students allowed for the completion of enough credit hours for student cumulative GPAs to “level out” while avoiding the selection issues attributed to using junior and senior students.

An additional risk of using the freshman class centered on other unexplained variances. Although this group may be the largest and most diverse, first-year students have limited experience operating in the environments which they would have reported as academically or socially supportive. When the survey was administered in the spring semester, many freshmen would have only been enrolled for a single semester. Not only is this a relatively short amount of time, but the transition into college is very stressful for many students. Responses from a group of students experiencing a stressful ecological
transition may provide data that is more representative of “surviving” an ecological transition than of academic and social support. This, in addition to the increased variance in the measure of how students are affected (GPA) would have made the data from student responses less generalizable to students already settled in to the university environment.

Enrollment as a campus-based student is the final inclusion criterion. This study sought to explore the levels of academic and social support from university environments. As such, students who take their classes online will likely operate in different environments than those who are enrolled on a campus. The results of this study will be generalizable to students experiencing varying levels of academic and social support at an Ohio University campus and the study of at-home environments of online students is not within the scope of this research.

**Including first-generation students in the sampling frame.** It was important that the completed sample included an appropriate amount of first-generation student respondents. Two key steps were taken to help encourage first-generation students to complete the survey: the inclusion of regional campuses and a communication plan grounded in social exchange theory.

The regional campuses and centers are commuter locations, offer an extensive schedule of evening classes, require only a high school diploma or equivalent to be admitted, and primarily offer career-orientated degrees. These characteristics of regional campuses and centers align very well with the needs of many first-generation students (Dennis et al., 2005) and the regional campuses have historically enrolled a higher
proportion of non-traditional students which research has shown are more likely to be the first in their family to attend college. Including the regional campuses and centers increased the number of first-generation students in the sampling frame, thus increasing the likelihood that the sample will include an adequate amount of first-generation students.

Simply having first-generation students in the sampling frame is not enough; they must be part of the completed sample. The communication plan for the survey was grounded in social exchange theory. Dillman (2000) suggests that increasing social rewards and decreasing social costs for participating in a survey can increase response rates. Additionally, Dillman argues that establishing trust with the members of the sample can further increase response rates. The pre-survey letter, questionnaire cover letter, and reminder communicated the social rewards for participation and established trust as suggested by Dillman. These items can be seen in the appendices to this document.

More specifically, the content of these communications helped promote completion by first-generation college students by explaining how they and their first-generation peers will benefit from this study and discussing how important their participation is to help better understand and support first-generation college students at Ohio University. Some strategies implemented as suggested by Dillman (1978, 2000) include showing positive regard, making questions interesting, giving social validation, explaining the value and scarcity of their input, avoiding embarrassing and subordinating language, avoiding asking for personal information, and communicating the importance of the task. Effectively communicating with first-generation students through these
strategies portrayed a favorable “reward, cost, and trust matrix” (Dillman, 2000, p.15) and encouraged participation.

**Survey Design and Procedures**

The survey method of data collection was advantageous to this research for many reasons. This study used variables derived from perceptions reported by the students. This data is not collected by the Office of Institutional Research of the university and is not available through the National Center for Educational Statistics or other aggregate datasets. It is only through the direct response of the students that these perceptions of academic and social support can be collected.

The survey design was an analytical study as described by Taylor (1999). The survey was administered to a population with common and varying attributes to explore the association among risk factors and outcomes. This approach is desirable as the research objectives of this study sought to explore associations among independent and dependent variables as opposed to simply identifying the prevalence of attributes in the population (Taylor, 1999).

Dillman (2000) suggests that survey design should be focused on minimizing three sources of error which could limit the ability of the findings to be generalized to the population. The sources of error include coverage error, measurement error, and nonresponse error. Below is a brief discussion of each source of error and steps included in the survey design to help reduce error from each.

**Coverage error.** The primary sources of coverage error for this research were inaccuracies in university data and potential issues in how the population is defined.
More specifically, the primary threat of coverage error to this research was the possibility of members of the sample not being retrieved when the university data is queried for students who meet the inclusion criteria.

The mechanisms used to query for students meeting the inclusion criteria accessed data which were used to compile reports for accreditors, funding, and federal reporting, all which require accurate data. The query was administered by a professional university employee with experience in information technology and institutional research. Additionally, previously published reports from the university were used to evaluate the accuracy of the number of students provided as the sampling frame. Public reports are currently available which show enrollment figures, attrition rates, enrollment by level (e.g., sophomore), and location. Given this data available, it was possible to evaluate if the sampling frame was realistic or if an error had occurred that omitted a portion of the survey population. After examining the public reports, it was estimated that approximately 5200 students would meet the inclusion criteria and the query retrieved 5233. The small difference in the amount of students expected and returned adds confidence to the accuracy of the query.

In addition to errors in university data, coverage error could have resulted from defining the population in a manner that unintentionally excludes a portion of the intended population from becoming part of the sampling frame. Care was taken to ensure the inclusion would allow for all members of the desired population to become part of the sampling frame. No exclusion criteria that may unintentionally prevent a subgroup of the population from being in the population were used. Excluding geographic regions,
academic disciplines, campuses, and other stratifications would increase the threat of coverage error as groups of students in any of these strata may have similar attributes and not including them would cause bias in the data. Broad inclusion criteria were used to be sure no subgroups were omitted from the population or sample frame.

**Measurement error.** Light et al. (1990) expands the discussion of measurement error by suggesting that measurement error should be discussed in more overarching terms of reliability. Light et al. suggests multiple steps that can be taken to help reduce measurement error and increase reliability such as increasing the number of items on the instrument, lengthening measurement scales, and considering the timing of the administration among other suggestions. The design and administration of this research incorporated these recommendations to help avoid measurement error and increase reliability; these procedures are addressed below.

This instrument used multiple items and scales to measure the constructs of academic and social support. This helped reduce measurement error by providing more measures of each construct. Any single item may have significant variability but using multiple items for each construct gave a more accurate portrayal of the desired measurement. The instrument used five-point Likert scales that included an option for a “Don’t Know/Unsure” response. Lengthening the scales and including the option for students who are unsure of the answer gave students more choices, allowed for unsure students to respond as opposed to skipping a question, and avoided the ambiguity in scale item differences that may arise from six- or seven-point scales. The survey design incorporated the role timing plays in the accuracy of the students’ awareness of their
participation in supportive activities. The survey was administered in the spring semester to allow for students to spend the fall semester living in the environments about which the survey asked to help increase students’ ability to accurately gage participation in activities and the level of support they received from the participation.

The reliability of the data was tested using Cronbach’s Alpha. Light et al. (1990) provides that Cronbach’s Alpha is commonly used to assess scale measurement error and reliability in higher education research. In previous research, Cronbach’s Alpha for importance and satisfaction responses for both freshmen and senior students completing the Student Involvement Questionnaire were all above .9 and the author concluded that “most of the variability is due to respondents and not the instrument” (Sand, 2000, p. 53). Although the findings of reliability in previous research are informative, modifications to the Student Involvement Questionnaire for this study required that reliability be reassessed. The reliability measurements for data provided by the new instrument are discussed in Chapter 4.

**Nonresponse error.** The ability of the web-based survey to be quickly administered to multiple geographic locations, taken at the students’ convenience, and completed quickly helped combat nonresponse error. The Qualtrics surveying system delivered the survey to Ohio University students. Using university e-mails assigned to all students in the target population helped increase the number of respondents. Students are encouraged by university staff and faculty to check e-mail daily. Although the frequency in which students check their university e-mail will vary, the use of this e-mail, as opposed to collecting e-mail addresses through other methods, help ensure valid e-mail
addresses for each member of the population were used. Obtaining a valid e-mail address for every student in the sample would not be feasible by any method other than obtaining university-issued e-mail addresses. Although using a university assigned e-mail address will not ensure students check their e-mail, doing so did ensure that the survey was delivered to a valid e-mail address for each student.

Multiple choice and Likert-type scales were used to reduce the time required to complete the survey and promote completion, which has been shown to increase the number of respondents (Hoerger, 2010). Obtaining an appropriate number of responses in the sample in a single-stage survey will require a wide reach and user-friendly survey that encourages completion (Hoerger, 2010).

Reminders were sent to non-respondents without violating their anonymity. Sending reminders allowed for missed invitations, deleted e-mails, and similar oversights to be remedied for students who may have otherwise forgotten to take the survey. Research has shown that using multiple contacts such as pre-survey letters and reminders has been associated with increased response rate which can reduce non-response error (Dillman, 2000).

Even though steps were taken to combat non-response error, the demographic data was analyzed to identify non-response error that may exist. The demographic statistics of the completed sample were compared to the demographic of the population to illuminate non-response bias arising from low response rates from certain groups of students. Public reports from the university’s institutional research website were used to
make estimates about the population and compare those estimates to the survey data. Gaps in the population data and the survey data are addressed in the analysis.

**Instrumentation**

Multiple resources were used to ensure questions are clearly worded and will provide reliable answers. Questions 1 and 2 were modified from the Ohio University Student Involvement Study. Questions 3, 4, 6, 9, and 10 on age, gender, race, living situation, and parental education were taken from the 2014 National Survey on Student Engagement. Question 5, on marital status, was taken from the 2000 U.S. census questionnaire found at www.census.gov. Questions 7 and 8 on student working situations were based on demographic questions provided by the Office of Student Affairs Assessment and Research from the University of Arizona. Questions 11 through 15 were developed using the methods suggested in Dillman (1978, 2000) such as using simple words, avoiding vague phrases in questions and answers, keeping the length of the questionnaire to a minimum, avoiding subordinating language, not asking objectionable questions, and avoiding asking about hypothetical situations.

This research used modified subsections of the questionnaire used in the Ohio University Student Involvement Study to collect data on academic and social support. According to the Office of Institutional Research’s website, the Student Involvement Study has been conducted annually since 1979 and the questionnaire has been through multiple revisions, most recently in the 2009-2010 academic year. The questionnaire has been used to provide data for three previous dissertations (Burk, 1992; Sand, 2000;
Williford, 1989) and the Office of Institutional Research has used it for more than three decades.

Academic support and social support, for this research, were defined by involvement in activities that students perceive to promote successful academic performance or improve their social experience. As such, an instrument which can assess involvement levels in academic and social events was an excellent starting point for an instrument for this study. Given that this study sought to understand the relationship between support and academic performance, modifications needed to be made to the original questionnaire to show if students perceived the involvement as academically or socially supportive.

Items 24 through 39 on the Student Involvement Study questionnaire were modified to be used for this study. Items 24 through 33 currently measure indicators of student social involvement and items 34 through 39 measure indicators of student academic involvement. In their current form, these items measure the importance of certain activities and the level of satisfaction students receive from involvement in the activities through a five-point Likert-type scale. In keeping with the original design, as little modification as possible was made to the original wording of the instrument. The new questionnaire also used the same instructions as the original questionnaire and used a similar five-point Likert-type scale which included an option for students to respond with “Unsure/Don’t know.” The modified questionnaire for this study asked students to report how often they are involved in such an activity and how supportive the activity is to their
social experience or academic performance. The original questionnaire and the adjusted instrument are both available in the appendices to this document.

As discussed in Chapter 1, ensuring perfectly accurate GPAs of student respondents would have come at the cost of anonymity, as personally identifiable information would be required to connect respondents to their official student file. The benefit of ensuring GPAs were reported with the level of precision provided by student record data is not worth the potential social desirability bias (Fernandes & Randall, 1992) or increased nonresponse error (Perneger, Cullati, Rudaz, Agoritsas, Schmidt, Combescur, & Courvoisier, 2014) that may result from requiring students to identify themselves so GPA data can be validated. Although student records may provide more precise GPA data, past research has shown self-reported GPAs to highly correlate with student record GPAs (Gray & Watson, 2002; Noftle & Robins, 2007) and that self-reported student GPAs are often used in published peer-review research journals (Caskie, Sutton, & Eckhardt, 2014). Given the risk of potential bias arising from identifying students and the findings of past research which showed self-reported GPAs to be highly correlated with student-record data, this study used self-reported GPAs as a criterion-valid measure of student GPAs.

Assessing Validity

Although the questionnaire to be used only slightly modified subsections of an instrument that has been used by the Office of Institutional Research for many years, the validity of the data provided by the modified instrument must be addressed. Light et al. (1990) describes validity as “how well a measure actually assesses what you want it to”
Light et al. continues to point out that while many forms of validity exist, it is critical that researchers address content and construct validity while designing research. Each of these forms of validity is discussed below.

**Content validity.** Light et al. (1990) posits that researchers must be concerned with two types of content validity. The authors state that researchers must address face validity and sampling-content validity when designing or modifying an instrument. Light et al. (1990) argues that although face validity is the most subjective form of validity, it is still very important. As suggested by literature on improving validity through research design (Brown, 2000; Light et al., 1990; Messick, 1995), the face validity of the instrument was established through consultation with methodological experts during the design process and provided feedback. Such consultation has already resulted in revising wording of questions, changing the order in which the questions are asked, restructuring questions from scale to multiple response, and adding choices given in the scale.

Light et al. (1990) suggests that sampling-content validity can be established by defining the areas of interest of your research, and ensuring that the instrument’s items, when taken together, clearly measure the stated areas of interest. The primary areas of interest of this research include parental education, academic performance, academic support, and social support. Students’ first-generation status was obtained by Question 8 on the questionnaire and self-reported by the student. Academic performance was measured by the students’ self-reported GPA, which was given by the student through Question 11 on the questionnaire.
This study operationalized a definition of academic support which included the *frequency of involvement* in experiences which the student perceives to *promote successful academic performance*. Question 1 on the questionnaire addressed these areas of interest. Similarly, this research operationalized a definition of social support which included the *frequency of involvement* in experiences which the student perceives to *positively impact their social experience in college*. Question 2 on the questionnaire addressed these areas of interest. The extent to which these measures accurately gaged the constructs of academic and social support is discussed below. However, content-sampling validity has been established as all domains of interest and how they were covered on the instrument have been identified.

**Construct validity.** This research assessed three constructs: academic support, social support, and academic performance. Academic support was assessed by analysis of student responses to Likert-type questions which ask the frequency in which students participate in academic activities that promote successful academic performance. Social support was assessed by the frequency in which students participate in social events that improve their social experience in college. The construct of academic performance was assessed by an analysis of respondents’ cumulative GPAs. Ensuring that the data collected actually measured the constructs in the study is important.

Light et al. (1990) provides that construct-validation pilot studies are especially useful when developing a new or modifying an instrument. While the instrument modified for this study has been used on similar populations at one of the locations in the research, construct measurement validation was still required. Pilot testing of the
instrument was administered to assist in improving construct validity. The instrument was pilot tested with eight individuals of varying age, gender, race, and major. The pilot group took the questionnaire on a variety of devices and browsers and all surveys were completed in the online format used when the live survey was administered. The pilot group completed all questions that were applicable and in no instance did anyone answer a question twice, provide illogical answers, or show any indications of misunderstanding directions. The pilot group communicated questions through a group chat developed to facilitate open discussion while the group completed the survey. Participants in the pilot study had a few questions about the questionnaire, but no changes were recommended.

**Variables and Analysis**

The independent and dependent variables associated with each research question are discussed. Immediately following the discussion of the variables for each sub-question, the statistical methods used to explore potential relationships between these variables are detailed. The analysis used in addressing each of the sub-questions below helped answer the overarching research question, which asks: What is the relationship among academic and social support and academic performance of first-generation college students?

**Sub-question 1.** The first sub-question guiding the design of this research project asks: What differences exist between first-generation college students compared to later-generation college students concerning age, race, marital status, sex, living arrangement, employment, involvement in campus activities, and parenting responsibilities?
Analysis. The independent variable for Sub-Question 1 is the binary variable created to show if students are first- or later-generation college students based on Question 10 on the questionnaire. Respondents were divided into two groups—first-generation and later-generation college students. The dependent variables in the first sub-question are the student characteristic information from the instrument. The responses of each group concerning attributes such as age, sex, race, employment, living arrangement, and marital status were examined for statistically significant differences between the groups. The questionnaire collected data providing both binary and continuous dependent variables. Between-group differences in categorical dependent variables were analyzed using Pearson’s chi-squared test and between-group differences in continuous dependent variables were analyzed with independent t-tests.

Sub-question 2. The second sub-question guiding the design of this research project asks: How do first-generation college students perform academically as compared to later-generation college students?

Analysis. The second sub-question was analyzed using t-tests and two, two-way ANOVA analyses. In the initial analysis, t-tests were performed to see if significant differences exist in the average GPA of the groups. In the ANOVA, the independent variables are generation status and college of enrollment as reported in Questions 10 and 14 on the questionnaire, respectively. In the second analysis, the independent variables are generation status and campus of enrollment as reported in Questions 10 and 12 on the questionnaire, respectively.
The college and campus of enrollment was included in the analysis to help isolate the relationship between academic performance and generational status. Faculty grading practices, student cultures, faculty expectations, and other potential influences on student GPAs may vary across campuses and colleges. Further, as noted in the literature review, first-generation students are more likely to enroll in two-year, career-focused majors, and attend non-residential campuses—which makes them more likely to attend a regional campus and more likely to enroll in colleges that offer career-focused degrees. By including both college and campus as independent variables in the analysis, the data provided better insight into the relationship between generational status and academic performance within each college or campus of enrollment. Examining the academic performance of both groups at the same campus and in the same college assisted in holding campus- and college-specific influences equal when studying differences in academic performance.

The dependent variable in both analyses is the students’ GPA provided in their response to Question 13 on the questionnaire. The initial analysis examined the main effect of generation status on GPA, the main effect of college of enrollment on GPA, and the effect of the interaction of generation status and college of enrollment on students’ GPA. The second analysis examined the main effect of generation status on GPA, the main effect of campus of enrollment on GPA, and the effect of the interaction of generation status and campus of enrollment on students’ GPA.


Sub-question 3. The third sub-question guiding the design of this research project asks: How do academic and social support relate to first-generation college students compared to later-generation college students?

Analysis. The dependent variables for the third sub-question consist of the constructs of academic and social support. As noted earlier, this research defines academic support as the frequency of involvement in student experiences that the student perceives to promote successful academic performance. Question 1 provided measured indictors of the frequency of involvement in academic activities and the students’ perceptions of if such involvement promotes academic success. As seen on the questionnaire, the questions measuring academic and social support consist of two, five-point Likert-type scales which collected data on the frequency of involvement in academic activities and the other collected data on if involvement promotes academic success. The construct of social support, defined in this research as the frequency of involvement in student experiences that the student perceives to positively impact their social experience in college, was measured in the same manner as academic support. Question 2 provided measured indictors of the frequency of involvement in social activities and the students’ perceptions of if such involvement improved their social experience in college through two, five-point Likert scales. The independent variable in the analysis of sub-question 3 was generational status.

The analysis of data pertaining to sub-question 3 used MANOVA to determine if generation status differed on reported levels of academic and social support.
Discriminant function analysis was used to further examine MANOVA results that were statistically significant.

**Required Sample Size**

According to the 2008 meta-analysis published by Lozar Manfreda, Bosnjak, Berzelak, Haas, and Vehovar, a response rate of 6% to 15% can be expected in online surveys. Achieving these response rates would have provided an estimated sample of approximately 300 to 750 respondents from the population of 5233 students in the sample frame. The α and power were be set before the data was gathered and analyzed. The α for this study is 0.05 and the power is set at .80. These limits are conventional for social science research and represent a 5% chance finding a statistically significant result when it does not exist and an 80% chance of finding a statistically significant result in the population that does exist (Field, 2013). Because no similar studies have been published to date, and effect size was unknown, statistics representing a medium effect size were used when calculating required sample sizes. Using the data above and G*Power software, the required sample size to perform the analysis for each research question was calculated.

Sub-question 1 used chi-squared analysis for categorical data and t-tests for continuous data. The largest chi-squared table has 7 degrees of freedom (two columns and eight rows). The required sample size for the largest chi-squared analysis is 160 (w = 0.3, α = 0.05, power = 0.80, df = 7), which will be sufficient for all other chi-squared analyses. The t-tests on the same sub-question require a sample size of 200 (d = 0.05, α = 0.05, power = 0.80, allocation ratio of 4 [N2/N1]). This allocation ratio is based on the
percent of later-generation students to the percent of first-generation students (80%:20%) as discussed in the population section above. Sub-question 2 includes two, two-way ANOVA analyses. The analysis with the most degrees of freedom included two columns and 11 rows (df = 10). The estimated sample size required for this analysis is 269 ($f = 0.25$, $\alpha = 0.05$, power = 0.80, df = 10). In the MANOVA analyses used in sub-question 3, the minimum required sample size to determine group differences was 34 ($f = 0.25$, $\alpha = 0.05$, power = 0.80). Comparing the estimated required sample sizes to the number of respondents ($N = 1278$) shows that the completed sample obtained was sufficient to perform the analysis.

The sample obtained in the study is not a random sample. Contact information was collected for all students meeting the inclusion criteria and all students in the population were invited to participate in the survey. Although random sampling is an assumption of ANOVA and MANOVA, this exploratory research used statistical significance as a tool to identify important differences between first- and later- generation students for further examination. The ability to invite all members of the population to participate helped achieve a sufficient number of first-generation college students to perform the statistical analysis as random sampling may have, by chance, excluded first-generation students from being included in the sampling frame. Additionally, students who identify as an ethnic minorities make up a small percentage of the population. Similar to generation status, inviting all students to participate ensured that no students identifying as an ethnic minority were randomly excluded so their information could be used in the analysis.
Chapter 4: Data Analysis and Results

The results of the data analysis are presented in this chapter. Initially, the characteristics of respondents are presented with a discussion of potential non-response bias. Second, an overview of aggregate data concerning academic and social support is provided. In the last section of this chapter, the results of the analysis of data concerning each research question are presented and discussed.

Descriptive Results

The survey was administered online from January 13 through February 1, 2016. The questionnaire was delivered to 5233 students who met the inclusion criteria and 1278 completed the survey. The response rate for the completed sample was 24.4%. Tables 1-4 show the profile for the students who participated in the survey.

Overview of student data. Table 1 shows that 544 (43.4%) of the students who responded reported being a first-generation college student and 709 (56.6%) reported being a later-generation college student as defined for this study. Table 1 also shows that of the students who responded, 409 (32.3%) reported their gender identity as man and 845 (66.6%) reported their gender identity as woman. The number of students who identified as White was 1149 (89.9%) and 65 students (5.0%) identified as Black or African American.

Table 1 continues to further describe the students who participated in the survey. Concerning marital status, 1131 students (89.3%) have never been married and 105 students (8.3%) reported being married at the time of the survey. As seen on the table, 447 (35.0%) students reported working on campus and 381 (29.8%) students reported
working off campus. More students reported working on campus (447) than off campus (381). A majority of the students (62.4%) reported living in dormitories or other campus housing. The second largest group (21.7%) reported living in a residence farther than walking distance from the campus. Table 1 continues to describe the living situations of the student respondents. Only 87 (6.8%) students reported being primary caregivers for children less than 18 years of age and 58 (4.5%) students reported being the primary caregiver for an elderly parent or other adult.

Table 1

Demographic Characteristics of Students who Completed the Survey

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-Generation</td>
<td>544</td>
<td>42.6</td>
</tr>
<tr>
<td>Later-Generation</td>
<td>709</td>
<td>55.6</td>
</tr>
<tr>
<td>Missing</td>
<td>25</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>845</td>
<td>66.1</td>
</tr>
<tr>
<td>Male</td>
<td>409</td>
<td>32.0</td>
</tr>
<tr>
<td>Another Gender Identity</td>
<td>8</td>
<td>0.6</td>
</tr>
<tr>
<td>Missing</td>
<td>16</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
<tr>
<td>Race or Ethnic Identification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>23</td>
<td>1.8</td>
</tr>
<tr>
<td>Asian</td>
<td>33</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Table 1 (Continued)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino</td>
<td>31</td>
<td>2.4</td>
</tr>
<tr>
<td>Black or African American</td>
<td>65</td>
<td>5.0</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>White</td>
<td>1149</td>
<td>89.9</td>
</tr>
<tr>
<td>Other Race</td>
<td>16</td>
<td>1.3</td>
</tr>
<tr>
<td>Missing</td>
<td>24</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>1344*</td>
<td>100</td>
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</tbody>
</table>

Marital Status

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Now Married</td>
<td>105</td>
<td>8.2</td>
</tr>
<tr>
<td>Widowed</td>
<td>4</td>
<td>.03</td>
</tr>
<tr>
<td>Divorced</td>
<td>22</td>
<td>1.7</td>
</tr>
<tr>
<td>Separated</td>
<td>5</td>
<td>2.8</td>
</tr>
<tr>
<td>Never Married</td>
<td>1131</td>
<td>88.5</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
<td>0.9</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
</tbody>
</table>

Employment

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Campus</td>
<td>447</td>
<td>35.0</td>
</tr>
<tr>
<td>Off-Campus</td>
<td>381</td>
<td>29.8</td>
</tr>
<tr>
<td>Not Employed</td>
<td>428</td>
<td>33.5</td>
</tr>
<tr>
<td>Missing</td>
<td>22</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
</tbody>
</table>

Living Situation

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dormitory or Campus Housing</td>
<td>798</td>
<td>62.4</td>
</tr>
<tr>
<td>Fraternity or Sorority</td>
<td>38</td>
<td>3.0</td>
</tr>
<tr>
<td>Residence within Walking Distance</td>
<td>69</td>
<td>5.4</td>
</tr>
</tbody>
</table>
Table 1 (Continued)

<table>
<thead>
<tr>
<th>Residence not within Walking Distance</th>
<th>277</th>
<th>21.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>96</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
</tbody>
</table>

Caregiver Responsibilities

<table>
<thead>
<tr>
<th>Primary Caregiver for Child</th>
<th>87</th>
<th>6.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Caregiver for Parent or Other Adult</td>
<td>58</td>
<td>4.5</td>
</tr>
<tr>
<td>No Caregiver Responsibilities Reported/Missing</td>
<td>1133</td>
<td>88.7</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
</tbody>
</table>

Note. *Total reported Race or Ethnic Identification is greater than the completed sample (n=1278) as respondents were allowed to select more than one race with which they identified. Percent column totals may be more than 100 due to rounding.

Respondents’ ages ranged from 18 to 69 with a mean age of 21.8 (SD = 5.65). Twenty-year-olds were the largest group with 584 (45.6%) followed by 21 year-olds with 330 (25.6%).

Tables 2, 3, and 4 present data on students’ educational characteristics. As seen in Table 2 the majority of the 951 (74.4%) students reported that they have completed most of their coursework on the Athens campus. The remainder of the students was spread throughout the regional campus system with the largest groups reporting Lancaster (7.3%) and Chillicothe (6.4%) as the campus at which they have completed a majority of their coursework.
Table 2

*Percent of Respondents by Campus of Enrollment*

<table>
<thead>
<tr>
<th>Campus of Enrollment</th>
<th>n</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens</td>
<td>951</td>
<td>74.4</td>
</tr>
<tr>
<td>Chillicothe</td>
<td>82</td>
<td>6.4</td>
</tr>
<tr>
<td>Eastern</td>
<td>23</td>
<td>1.8</td>
</tr>
<tr>
<td>Lancaster</td>
<td>93</td>
<td>7.3</td>
</tr>
<tr>
<td>Ironton</td>
<td>48</td>
<td>3.8</td>
</tr>
<tr>
<td>Zanesville</td>
<td>57</td>
<td>4.5</td>
</tr>
<tr>
<td>Ohio University Center</td>
<td>9</td>
<td>0.7</td>
</tr>
<tr>
<td>Missing</td>
<td>15</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1278</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Note.* Locations at Cleveland, Dublin, Pickerington, and Proctorville were combined into a single variable of Ohio University Center. Percent column totals may be more than 100 due to rounding.

Table 3 presents the academic colleges in which students reported to be enrolled.

The College of Arts and Sciences and the College of Health Sciences and Professions were the largest colleges of enrollments with 249 (19.5%) and 241 (18.9%) respectively. The colleges with the fewest students enrolled were the Honors Tutorial College (2.5%) and University College (4.7%).
Table 3

**Percent of Respondents by College of Enrollment**

<table>
<thead>
<tr>
<th>College of Enrollment</th>
<th>n</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Arts and Sciences</td>
<td>249</td>
<td>19.5</td>
</tr>
<tr>
<td>College of Business</td>
<td>146</td>
<td>11.4</td>
</tr>
<tr>
<td>College of Fine Arts</td>
<td>58</td>
<td>4.5</td>
</tr>
<tr>
<td>College of Health Sciences and Professions</td>
<td>241</td>
<td>18.9</td>
</tr>
<tr>
<td>Honors Tutorial College</td>
<td>32</td>
<td>2.5</td>
</tr>
<tr>
<td>College of Education</td>
<td>124</td>
<td>9.7</td>
</tr>
<tr>
<td>College of Engineering and Technology</td>
<td>112</td>
<td>8.8</td>
</tr>
<tr>
<td>College of Communication</td>
<td>173</td>
<td>13.5</td>
</tr>
<tr>
<td>University College</td>
<td>60</td>
<td>4.7</td>
</tr>
<tr>
<td>Missing</td>
<td>83</td>
<td>6.5</td>
</tr>
<tr>
<td>Total</td>
<td>1278</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4 shows GPA data for the students who participated in the survey. A majority (65.4%) of the students had a cumulative GPA in the 3.0 through 3.99 range. Students with a GPA ranging from 2 through 2.99 made up the second largest group of respondents 324 (26.1%). Students with GPAs below 1.99 made up 1.9% (24) of the respondents and 81 students with a 4.0 or above made up 6.5% of respondents.
Table 4

Percent of Respondents by GPA Range

<table>
<thead>
<tr>
<th>Percent of Students</th>
<th>.01-1.99</th>
<th>2.00-2.99</th>
<th>3.00-3.99</th>
<th>4.0 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.9</td>
<td>26.1</td>
<td>65.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

In addition to the tables above, data was collected which described the transfer status of students who participated in the survey. Of the students who responded 182 (14.3%) transferred to Ohio University from another college or university.

Assessing Non-response Bias

Contact information was obtained for all students at Ohio University who met the inclusion criteria. In this section, characteristics of the respondents are compared to characteristics of the study population in effort to identify particular groups of students who did not respond. Obtaining actual data on the student population would violate university policy (L. Ohlinger, personal communication, January 4, 2016). Thus, the data used to compare the expected proportions of respondents to actual respondents was obtained on the university’s institutional research website and represents enrollment statistics for Spring 2015, the most recent semester available.

The completed sample included a slightly larger proportion of females (66.6%) than the university sophomore population (55.7%). Additionally, the completed sample included slightly more students who identify as White (89.9%) than the university data (85.5%), and more students who identify as Black or African American–5.0% of the completed sample as opposed to 4.7% of the university data. The completed sample had a smaller proportion (5.0%) of respondents who identify as a race other than White, Black,
or African American than the university data (9.8%). Nineteen through 22 year olds were the largest age groups in both the respondents and the university data. In both datasets, 20 and 21 year old students comprised 71%-73% of the dataset and 19 through 22 year old students made up more than 84% of the dataset.

Although exact university data on the number of first-generation students was not available, the only estimate provided by the university is that nearly 25% of the incoming students at the Athens campus are first-generation. In the survey data, 42.6% of students who responded reported being first-generation college students as defined in the study. The difference in the two measures of first-generation college student enrollment and participation above are not perfectly comparable, but are examined with the best data available. The university-reported figure of 25% of the incoming class being first-generation students is for the Athens campus. This figure likely understates the actual percent of first-generation college students enrolled across all campuses of Ohio University. As discussed in Chapters 2 and 3, previous research suggests that the regional campuses of Ohio University are more likely to enroll first-generation college students given the regional campuses’ less-competitive admissions requirements, vocational majors, and two-year degrees. There were no indications in the data that a disproportionately high response rate of first-generation students caused bias. As mentioned above, the actual difference in the population and sample data is likely much less than implied.

In addition to the demographic data outlined above, educational attributes of students in both datasets were studied. The data show that 62.4% of respondents reported
living on campus. This proportion of students living on campus is much higher than the 48.6% of students the university data reports living on the Athens campus. In both datasets, the College of Arts and Sciences and the College of Health Sciences and Professions provided the highest proportions of students. Of the respondents, 19.5% of the data was provided by students who reported the College of Arts and Sciences as their college of enrollment and 18.9% reported enrollment in the College of Health Sciences and Professions. In the university data, 18.4% of the students reported enrollment in the College of Arts and Sciences and 17.5% in the College of Health Sciences and Professions.

Most students who participated in the study reported that they completed their coursework on the Athens campus. The university data provides that 67.3% of sophomores attended the Athens campus in Spring 2015. In the study data, 74.4% of respondents claimed they have completed most of their coursework at the Athens campus. As with the university data, the study data show that the largest groups of students from the regional campuses were from Lancaster and Chillicothe and the smallest group represented by a regional campus was from the Eastern (St. Clairsville) campus. In all, the university data show that 32.7% of sophomores attended a regional campus in Spring 2015 compared the 24.5% of respondents.

Although differences in the university and study data cannot be measured with perfect precision, exploring potential disproportions among student responses and the population gives important context to the analysis. Female, first-generation students who identified as White and attended the Athens campus had response rates that were
somewhat higher than the university enrollment data. However, no patterns in the data indicated bias due to disproportionately high response rates from these groups and no severe threat of non-response bias was observed.

**Overview of Social Support**

In this section, results of the study concerning students’ responses on the level of social support from activities in university environments are presented. The reliability of data from each scale was analyzed using Cronbach’s alpha. The scales used to collect data on the frequency of social activities and the impact such activities had on the social experience each contained eight items. Cronbach’s alpha for the items measuring the frequency of social involvement was .62 and the alpha for the items measuring impact such involvement had on students’ social experience was .79. The data provided by these scales is presented below. Interestingly, the item concerning working while enrolled negatively affected the alpha for each group of items. Without this item, the alpha for the items collecting data on frequency of social activities was .72, and the alpha for the items collecting data on the impact of participation was .81.

Table 5 shows student responses to the scale items measuring social support. The table provides percentages of student responses concerning the frequency and positive impact of social activities. The table shows the most popular choices concerning personal relationships were the choices of participating Very Often and being Very Much So positively impacted by participating in this activity. Similar to the data describing personal relationships, the largest percent of responses showed that students Very Often spent time with close friends and were Very Much So positively impacted when doing so.
The table gives an overview of student responses concerning the frequency and positive impact of attending cultural events on campus. The largest percent of student responses to this variable was Never Attending cultural activities and Not at All being positively impacted. The table shows that cultural events are Very Often attended by very few students; however, relatively large groups of students reported Sometimes attending cultural events on campus and being Somewhat positively impacted by the participation.

Table 5 also presents data on student responses about interacting with international students. The largest groups of responses were from students who Rarely interact with international students and their social experience in college was Not at All positively impacted. However, many students reported Sometimes interacting with international students and the interaction Somewhat positively impacting their social experience. The data also show that interacting with people of a different race is a very common activity among students and students’ social experience in college is positively impacted by these experiences. The data show that the largest category of responses was from students who Sometimes interact with individuals of a different race and are Somewhat positively impacted by their experiences. Another large group of students reported such interactions happening Very Often and being Very Much So positively impacted by the experience.

The data in Table 5 also show student responses to the items inquiring about participation in religious activities. The data show that a large group of students reported Never attending religious events on campus and many students felt their social experience was Not at All positively impacted. The data show that few students reported
regularly attending religious events on campus. Students largely reported Very Often working while enrolled and Very Much So or Somewhat feeling that doing so provided a positive social impact. Conversely, another large group of students reported Never working on campus and answered Not at All when asked about any positive impact working had on their social experience.

The survey data on academic support are provided before addressing the research questions which explore relationships among variables when the data is disaggregated into groups.
Table 5

Overview of Social Support Items as Percentage of Student Responses

<table>
<thead>
<tr>
<th>Frequency of Participation</th>
<th>Positively Impact Social Experience in College?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>Involvement in personal relationships</td>
<td>5.3</td>
</tr>
<tr>
<td>Spending time with close friends at Ohio University</td>
<td>5.9</td>
</tr>
<tr>
<td>Getting involved in student organizations</td>
<td>18.0</td>
</tr>
<tr>
<td>Attending cultural events on campus</td>
<td>35.9</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>24.9</td>
</tr>
</tbody>
</table>
Table 5 (Continued)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
<th>Group E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interacting with people of different races</td>
<td>2.8</td>
<td>8.3</td>
<td>7.7</td>
<td>47.4</td>
<td>33.8</td>
</tr>
<tr>
<td></td>
<td>11.4</td>
<td>7.6</td>
<td>20.8</td>
<td>31.5</td>
<td>28.6</td>
</tr>
<tr>
<td>Getting involved in religious activities</td>
<td>55.3</td>
<td>17.8</td>
<td>7.9</td>
<td>11.7</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>42.6</td>
<td>7.7</td>
<td>24.2</td>
<td>13.6</td>
<td>11.9</td>
</tr>
<tr>
<td>Having a job while enrolled</td>
<td>35.5</td>
<td>6.4</td>
<td>6.3</td>
<td>13.0</td>
<td>38.7</td>
</tr>
<tr>
<td></td>
<td>26.1</td>
<td>10.3</td>
<td>18.3</td>
<td>21.6</td>
<td>23.8</td>
</tr>
</tbody>
</table>
Overview of Academic Support

This section provides an overview of survey data on levels of reported frequencies of involvement in academic activities and student responses to questions asking if such involvement promotes successful academic performance. Similar to the previous section, the reliability of data from the scales was analyzed using Cronbach’s alpha. The scales collecting data on the frequency of involvement in academic activities and if these activities promoted successful academic performance each had 5 items. Cronbach’s alpha for the items measuring frequency of involvement in activities was .71 and the alpha for the items measuring promotion of successful academic performance from these activities was .78.

Table 6 shows data on items measuring involvement in academic activities and promotion of academic success. The largest groups of responses concerning receiving instruction in major courses came from students who reported receiving instruction in their major classes Very Often and Very Much So promoting successful academic performance. As can be seen on the table, very few students reported a low level of frequency in this area, and few reported this activity less than Somewhat promoting successful academic performance. The table also gives insights into student participation in and promotion of successful academic performance from instruction in non-major courses. Similar to data concerning instruction in major courses, the data show that the largest groups of students reported receiving instruction in non-major courses Very Often and Very Much So promoting successful academic performance.
The table also outlines student responses to items concerning utilizing faculty availability. The data show that students often take advantage of faculty availability and often consider it to promote successful academic performance. The largest groups of responses were from students who reported Sometimes utilizing faculty availability and consider it to Very Much So promote academic performance. Concerning social interaction with faculty, the largest groups of responses were from students reporting Sometimes making social contacts with faculty and such contacts Very Much So promoting successful academic performance. Large groups of students reported making social contacts with faculty Very Often and that the contacts Somewhat promoted successful academic performance. The data show that social contacts with faculty promote successful academic performance more than not at any level of interaction. The data in Table 6 suggest that, similar to social contacts with faculty, receiving academic advising also promotes successful academic performance. A review of the table shows that large groups of students reported Very Often or Sometimes participating in academic advising and this activity Very Much So promoting successful academic performance.

The analyses thus far described the survey data on student attributes and student responses to measures of academic and social support. The analyses were presented at the aggregate level and help frame the data collected to address the research questions of the study. Below, each research question is addressed.
### Table 6

**Overview of Academic Support Items as Percentage of Student Responses**

<table>
<thead>
<tr>
<th>Frequency of Participation</th>
<th>Promote Successful Academic Performance?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at All</td>
</tr>
<tr>
<td>Never</td>
<td>1.8</td>
</tr>
<tr>
<td>Rarely</td>
<td>4.0</td>
</tr>
<tr>
<td>Unsure/Don't Know</td>
<td>3.7</td>
</tr>
<tr>
<td>Sometimes</td>
<td>11.4</td>
</tr>
<tr>
<td>Very Often</td>
<td>4.5</td>
</tr>
</tbody>
</table>

- Receiving instruction in major courses
- Receiving instruction in non-major courses
- Utilizing faculty availability
- Making social contacts with faculty
- Receiving academic advising
Research Questions and Data Analysis

The overarching research question of this study asks: What is the relationship among academic and social support and academic performance of first-generation college students? As discussed in Chapter 3, this study seeks to answer this research question through the analysis of data from three sub-questions. Each of these sub-questions is addressed below.

**Sub-question 1.** The first research sub-question asks: What differences exist between first-generation college students and later-generation college students concerning age, race, marital status, gender, living arrangement, employment, campus of enrollment, and parenting/caregiving responsibilities? Each of these variables is analyzed below to further explore student attributes, with an emphasis on differences between first- and later-generation students as independent groups through chi-squared analysis and independent groups t-tests.

Table 7 presents the first examination of potential differences that exist among first- and later-generation students. The table shows the chi-squared analysis of the dependent variable of gender. As can be seen from Table 7, the proportion of males was not significantly different from the proportion of females in either generation status. As such, there appears to be no significant association between generation status and gender, $\chi^2(3) = 6.09, p = .107$. 
Table 7

**Chi-squared Analysis: Generation Status to Gender**

<table>
<thead>
<tr>
<th>Gender Identity</th>
<th>Generation Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>156</td>
<td>28.7</td>
<td>248</td>
</tr>
<tr>
<td>Woman</td>
<td>382</td>
<td>70.3</td>
<td>452</td>
</tr>
<tr>
<td>Another Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identity</td>
<td>3</td>
<td>0.6</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. No significant associations were found between generation status and gender, $\chi^2 (3) = 6.09$, $p = .107$.

Table 8 shows the chi-squared analysis for race or ethnicity with which students identify in each generation status. A review of the table shows that a large portion of both first-generation (88.8%) and later-generation (92.7%) identified as White. Additionally, 5.7% of first-generation students identified as Black or African American compared to 4.5% of later generation students. Responses to all other choices on the questionnaire were each less than 3% of the total responses within each generation status. The data suggest that there is no significant association between generation status and race or ethnic identity, $\chi^2 (7) = 3.97$, $p = .783$. 
Table 8

*Chi-squared Analysis: Generation Status to Race or Ethnic Identification*

<table>
<thead>
<tr>
<th>Race or Ethnic Identity</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>12</td>
<td>2.2</td>
</tr>
<tr>
<td>Asian</td>
<td>13</td>
<td>2.4</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>14</td>
<td>2.6</td>
</tr>
<tr>
<td>Black or African American</td>
<td>31</td>
<td>5.7</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>White</td>
<td>483</td>
<td>88.8</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Note.* No significant associations were found between generation status and race or ethnic identification, $\chi^2 (7) = 3.97$, $p = .783$.

Table 9 shows the results of the chi-squared analysis of student responses about marital status. As can be seen, the proportion of first-generation students who are married is significantly larger than the proportion of later-generation students who reported being currently married. The difference in proportions was large enough to suggest that there is
a significant association between generation status and if students are currently married $\chi^2(4) = 32.12, p < .001$.

Table 9

*Chi-squared Analysis: Generation Status to Marital Status*

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>%</td>
</tr>
<tr>
<td>Now Married</td>
<td>61</td>
<td>11.2</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>Divorced</td>
<td>16</td>
<td>2.9</td>
</tr>
<tr>
<td>Separated</td>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>Never Married</td>
<td>459</td>
<td>84.4</td>
</tr>
</tbody>
</table>

*Note.* Significant differences were found between generation statuses, $\chi^2(4) = 32.12, p < .001$.

Table 10 displays the chi-squared analysis of student responses to the questionnaire item about living situations while enrolled. The table shows that there are differences in the living situations of many first- and later-generation students. The data show that a significantly larger proportion of later-generation students live in dormitories, fraternities, or sororities. Conversely, a significantly larger proportion of first-generation students than later-generation students live outside of walking distance from the campus while enrolled. Thus, there is a significant association between generation status and living arrangement while enrolled, $\chi^2(4) = 111.58, p < .001$. 
Table 10

Chi-squared Analysis: Generation Status to Living Situation While Enrolled

<table>
<thead>
<tr>
<th>Living Arrangement While Enrolled</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>$%$</td>
</tr>
<tr>
<td>Dormitory or other Campus Housing</td>
<td>265</td>
<td>48.7</td>
</tr>
<tr>
<td>Fraternity of Sorority</td>
<td>10</td>
<td>1.8</td>
</tr>
<tr>
<td>Residence within Walking Distance of Campus</td>
<td>34</td>
<td>6.3</td>
</tr>
<tr>
<td>Residence Farther than Walking Distance from Campus</td>
<td>182</td>
<td>33.5</td>
</tr>
<tr>
<td>None of the Above</td>
<td>53</td>
<td>9.7</td>
</tr>
</tbody>
</table>

*Note.* Significant differences were found between generation statuses, $\chi^2 (4) = 32.12, p < .001.$

Tables 11 and 12 provide information on the amount of hours students reported working on and off campus while enrolled. Table 11 shows that most of the students who participated (64.7%) do not work on campus. For the students who do have on-campus employment, there was no significant association between generation status and the reported hours worked in on-campus employment. A review of Table 12 shows that a significant association does exist between generational status and the number of hours worked per week by students who reported having off-campus employment, $\chi^2 (5) = 93.17, p < .001.$ The proportion of first-generation students who work off-campus at all
levels of hours except 1-10 hours per week was significantly larger than the proportion of later-generation students working the same level of hours.

Table 11

*Chi-squared Analysis: Generation Status to Hours Worked Per Week On Campus*

<table>
<thead>
<tr>
<th>Hours Worked on Campus</th>
<th>Generation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>None</td>
<td>346</td>
</tr>
<tr>
<td>1-10</td>
<td>102</td>
</tr>
<tr>
<td>11-20</td>
<td>73</td>
</tr>
<tr>
<td>21-30</td>
<td>14</td>
</tr>
<tr>
<td>31-40</td>
<td>4</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note.* No significant differences were found between generation statuses, $\chi^2 (5) = 2.98$, $p = .701$. 
Table 12

*Chi-squared Analysis: Generation Status to Hours Worked Per Week Off Campus*

<table>
<thead>
<tr>
<th>Hours Worked Off Campus</th>
<th>Generation Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-Generation</td>
<td>Later-Generation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>None</td>
<td>301</td>
<td>55.4</td>
<td>558</td>
</tr>
<tr>
<td>1-10</td>
<td>54</td>
<td>9.9</td>
<td>54</td>
</tr>
<tr>
<td>11-20</td>
<td>76</td>
<td>14.0</td>
<td>44</td>
</tr>
<tr>
<td>21-30</td>
<td>54</td>
<td>9.9</td>
<td>34</td>
</tr>
<tr>
<td>31-40</td>
<td>28</td>
<td>5.2</td>
<td>13</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>30</td>
<td>5.5</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note.* Significant differences were found between generation statuses, $\chi^2 (5) = 93.17, p < .001.$

Tables 13, 14 and 15 show data describing each generation status’ responsibilities concerning caring for others. The questionnaire asked students to report if they were the primary caregiver for a child less than 18 years of age, an elderly parent, or another adult that required care for basic needs. Table 13 shows that a significant association does exist between generational status and being a primary caregiver for a child under 18, $\chi^2 (1) = 49.68, p < .001,$ where a significantly larger portion of first-generation students reported having caregiving responsibilities for a child. Table 14 shows that a significant association exists between generation status and being the caregiver for an elderly parent, $\chi^2 (1) = 10.45, p < .01,$ in which a significantly larger portion of first-generation students care for elderly parents. Table 15 shows that a significant association exists between generation status and being responsible for the care of another adult, $\chi^2 (1) = 7.29, p <$
.01. In this variable as well, a larger proportion of first-generation students are responsible for the care of another adult.

Table 13

*Chi-squared Analysis: Generation Status to Caring for Child*

<table>
<thead>
<tr>
<th>Primary Caregiver Responsibility</th>
<th>Generation Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Later-Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Less than 18 Years of Age</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>68</td>
<td>12.5</td>
<td>17</td>
</tr>
</tbody>
</table>

*Note.* Significant differences were found between generation statuses, $\chi^2 (1) = 49.68$, $p < .001$.

Table 14

*Chi-squared Analysis: Generation Status to Caring for Elderly Parent*

<table>
<thead>
<tr>
<th>Primary Caregiver Responsibility</th>
<th>Generation Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First-Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Later-Generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elderly Parent</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>3.1</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note.* Significant differences were found between generation statuses, $\chi^2 (1) = 10.45$, $p < .01$. 
Table 15

Chi-squared Analysis: Generation Status to Caring for Other Adult

<table>
<thead>
<tr>
<th>Primary Caregiver Responsibility</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Other Adult</td>
<td>23</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Note. Significant differences were found between generation statuses, $\chi^2 (1) = 7.29, p < .01$.

Table 16 shows data comparing the ages of first- and later-generation students. As can be seen, the mean age of first generation students, $n = 539$, $M = 23.30$, $SD = 7.60$, is more than two years higher than that of their later-generation peers, $n = 706$, $M = 20.64$, $SD = 2.99$. This difference proved to be significant, $t(665) = 7.67, p < .001$. First-generation students who participated in the study were, on average, statistically significantly older than later-generation students.

Table 16

Results of t-test and Descriptive Statistics for Age by Generation Status

<table>
<thead>
<tr>
<th>Generation Status</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Age</td>
<td>23.3</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Note. ***$p < .001$
Sub-question 2. The second sub-question of this study asks: How do first-generation college students perform academically compared to later-generation college students? Independent t-tests and two-way ANOVAs were used to analyze variables in this question as described in the previous chapter.

The mean GPAs for the two groups were analyzed using independent groups t-tests. The mean GPA for first-generation college students, $n = 531$, $M = 3.15$, $SD = .59$, was lower than the mean GPA of later-generation students, $n = 696$, $M = 3.31$, $SD = .52$. As can be seen in Table 17 the results of the t-test showed that the mean GPA of first-generation students was significantly lower than the mean of later-generation students, $t(1050) = -4.87$, $p < .001$.

Table 17

Results of t-test and Descriptive Statistics for GPA by Generation Status

<table>
<thead>
<tr>
<th>Generation Status</th>
<th>First-Generation</th>
<th>Later-Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>GPA</td>
<td>3.15</td>
<td>.594</td>
</tr>
</tbody>
</table>

Note. ***p < .001

Two-way ANOVA was used to determine if generation status, college of enrollment, or the interaction of generation status and college of enrollment were associated with GPA. Table 18 shows the mean GPA and descriptive statistics for each group in all colleges. The analysis shown in Table 19 found that there was a significant main effect of generational status on the students’ GPA, $F(1, 1207) = 9.42$, $p < .01$,
across all colleges. Further, the data suggest a significant main effect of college of enrollment across generational statuses, $F(9, 1207) = 5.74$, $p < .001$. The data also show that there was a no significant interaction between the generation status and college enrolled on students’ GPA, $F(9, 1207) = .951$, $p > .05$. Homogeneity of variance was initially tested using Levene’s test. The result of the Levene’s test was significant for the ANOVA, $F(19, 1207) = 2.79$, $p = < .001$. Although Levene’s test was significant, research has shown that this test is very sensitive to large sample sizes and unequal groups, both of which are characteristics of this study (Field, 2013). The more robust Welch test was significant when conducted and confirmed the findings of the ANOVA results can be correctly interpreted, Welch’s $F(9, 323) = 22.89$, $p < .001$.

Bonferroni post hoc analysis showed that students in the College of Arts and Sciences had a significantly lower GPA, $M = 3.17$, $SD = .62$, than students in the Scripps College of Communication, $M = 3.35$, $SD = .51$, at the $p < .05$ level. The post hoc analysis also showed that students University College reported a significantly lower, GPA, $M = 2.83$, $SD = .72$, than all other colleges and students in the Honors Tutorial College reported a significantly higher GPA, $M = 3.84$, $SD = .24$, than students in all other colleges at the $p < .05$ level.
Table 18

GPA and Descriptive Statistics for First- and Later-Generation Students in All Colleges

<table>
<thead>
<tr>
<th>College of Enrollment</th>
<th>First-Generation</th>
<th>Later-Generation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>College of Arts and Sciences</td>
<td>3.12</td>
<td>0.63</td>
<td>124</td>
</tr>
<tr>
<td>College of Business</td>
<td>3.19</td>
<td>0.52</td>
<td>53</td>
</tr>
<tr>
<td>College of Fine Arts</td>
<td>3.06</td>
<td>0.62</td>
<td>19</td>
</tr>
<tr>
<td>College of Health Sciences and Professions</td>
<td>3.15</td>
<td>0.55</td>
<td>117</td>
</tr>
<tr>
<td>Honors Tutorial College</td>
<td>3.73</td>
<td>0.21</td>
<td>3</td>
</tr>
<tr>
<td>Patton College of Education</td>
<td>3.30</td>
<td>0.56</td>
<td>62</td>
</tr>
<tr>
<td>Russ College of Engineering and Technology</td>
<td>3.08</td>
<td>0.57</td>
<td>35</td>
</tr>
<tr>
<td>Scripps College of Communication</td>
<td>3.37</td>
<td>0.50</td>
<td>41</td>
</tr>
<tr>
<td>University College</td>
<td>2.73</td>
<td>0.76</td>
<td>35</td>
</tr>
<tr>
<td>Unsure/Don’t Know</td>
<td>3.15</td>
<td>0.52</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>3.15</td>
<td>0.59</td>
<td>531</td>
</tr>
</tbody>
</table>
Table 19

*Two-Way Analysis of Variance of GPA by Generation Status and College of Enrollment*

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation Status</td>
<td>1</td>
<td>2.71</td>
<td>2.71</td>
<td>9.42</td>
<td>.002**</td>
</tr>
<tr>
<td>College of Enrollment</td>
<td>9</td>
<td>14.86</td>
<td>1.65</td>
<td>5.74</td>
<td>.000***</td>
</tr>
<tr>
<td>Generation Status x College of Enrollment</td>
<td>9</td>
<td>2.46</td>
<td>.274</td>
<td>.951</td>
<td>.480</td>
</tr>
<tr>
<td>Within Cells</td>
<td>1207</td>
<td>347.33</td>
<td>.288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1226</td>
<td>379.62</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* N = 1227. **p < .01. ***p < .001.

The second ANOVA sought to determine if generation status, campus of enrollment, or the interaction of generation status and campus was associated with the GPA of first- and later- generation students. Table 20 shows the mean GPA and descriptive statistics for each group at all campuses. Table 21 shows that there is a significant main effect of generation status on GPA, $F(1, 1208) = 4.81, p < .05$ across all campuses and a significant main effect of campus enrolled on GPA, $F(6, 1208) = 2.73, p < .05$ across generation statuses. The data show that there is no significant interaction effect between generation status and campus of enrollment on GPA $F(6, 1208) = .667, p > .05$. Similar to the first analysis, homogeneity of variance was initially tested using Levene’s test. The result of the Levene’s test was significant for the ANOVA, $F(13, 1208) = 3.48, p = .< .001$ As discussed previously, the large sample size and uneven group sizes of this project require Levene’s to be followed up with a more robust test. The more robust Welch test was significant when conducted and confirmed the findings of the ANOVA results can be correctly interpreted, Welch’s $F(6, 64.91) = 2.59, p < .001$. 


Bonferroni post hoc analysis showed only one statistically significant between-campus difference in GPA. The post hoc analysis showed that students at Ohio University Centers reported a significantly lower GPA, $M = 2.71$, $SD = .97$, than students at the Ironton Campus $M = 3.44$, $SD = .46$ at the $p < .05$ level.

Table 20

*GPA and Descriptive Statistics for First- and Later-Generation Students at All Campuses*

<table>
<thead>
<tr>
<th>Campus of Enrollment</th>
<th>First-Generation</th>
<th>Later-Generation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$n$</td>
</tr>
<tr>
<td>Athens</td>
<td>3.10</td>
<td>0.62</td>
<td>329</td>
</tr>
<tr>
<td>Chillicothe</td>
<td>3.31</td>
<td>0.43</td>
<td>59</td>
</tr>
<tr>
<td>Eastern</td>
<td>2.92</td>
<td>0.50</td>
<td>10</td>
</tr>
<tr>
<td>Lancaster</td>
<td>3.14</td>
<td>0.61</td>
<td>58</td>
</tr>
<tr>
<td>Ironton</td>
<td>3.44</td>
<td>0.43</td>
<td>32</td>
</tr>
<tr>
<td>Zanesville</td>
<td>3.26</td>
<td>0.47</td>
<td>35</td>
</tr>
<tr>
<td>Ohio University Center</td>
<td>2.61</td>
<td>1.13</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>3.15</td>
<td>0.59</td>
<td>529</td>
</tr>
</tbody>
</table>
Table 21

Two-Way Analysis of Variance of GPA by Generation Status and Campus of Enrollment

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation Status</td>
<td>1</td>
<td>1.44</td>
<td>1.44</td>
<td>4.81</td>
<td>.028*</td>
</tr>
<tr>
<td>Campus of Enrollment</td>
<td>6</td>
<td>4.91</td>
<td>.818</td>
<td>2.73</td>
<td>.012*</td>
</tr>
<tr>
<td>Generation Status x Campus of Enrollment</td>
<td>6</td>
<td>1.20</td>
<td>.200</td>
<td>.667</td>
<td>.677</td>
</tr>
<tr>
<td>Within cells</td>
<td>1208</td>
<td>361.76</td>
<td>.299</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1221</td>
<td>377.91</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 1222. *p < .05.

Sub-question 3. The third sub-question for this study asks: How do academic and social support relate to first-generation college students compared to later-generation college students?

MANOVA was used to determine if first- and later-generation students reported different levels of academic or social support. In the first analysis, MANOVA was used to determine if mean differences existed in the levels of academic support reported by first- and later-generation students. The construct of academic support, the dependent variable in the analysis, was measured by Likert-type scales in the questionnaire. The results of the first MANOVA suggest that no statistically significant between-group differences exist in the levels of academic support reported by students, $V = .01$, $F (10, 1135) = 1.32$, $p = .214$. Table 22 shows the mean responses and descriptive statistics from first- and later-generation students. Table 23 shows the findings of the multivariate and univariate analysis of variance concerning academic support.
Table 22

*Mean Responses and Descriptive Statistics for First- and Later-Generation Students for Academic Support Items*

<table>
<thead>
<tr>
<th>Academic Support Indicator</th>
<th>First-Generation</th>
<th>Later-Generation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>How often do you participate in this activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving instruction in my major courses</td>
<td>4.39</td>
<td>.93</td>
<td>535</td>
</tr>
<tr>
<td>Receiving instruction in my non-major courses</td>
<td>3.97</td>
<td>1.13</td>
<td>536</td>
</tr>
<tr>
<td>Utilizing faculty availability</td>
<td>3.64</td>
<td>1.13</td>
<td>535</td>
</tr>
<tr>
<td>Making social contacts with faculty</td>
<td>3.18</td>
<td>1.33</td>
<td>534</td>
</tr>
<tr>
<td>Receiving academic advising</td>
<td>3.72</td>
<td>1.17</td>
<td>535</td>
</tr>
</tbody>
</table>
Table 22 (Continued)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving instruction in my major courses</td>
<td>4.45</td>
<td>.96</td>
<td>502</td>
<td>4.60</td>
<td>.77</td>
<td>664</td>
<td>4.53</td>
<td>.86</td>
<td>1166</td>
</tr>
<tr>
<td>Receiving instruction in my non-major courses</td>
<td>4.07</td>
<td>1.15</td>
<td>500</td>
<td>4.18</td>
<td>1.07</td>
<td>665</td>
<td>4.13</td>
<td>1.11</td>
<td>1165</td>
</tr>
<tr>
<td>Utilizing faculty availability</td>
<td>4.06</td>
<td>1.11</td>
<td>499</td>
<td>4.12</td>
<td>1.08</td>
<td>667</td>
<td>4.09</td>
<td>1.09</td>
<td>1166</td>
</tr>
<tr>
<td>Making social contacts with faculty</td>
<td>3.70</td>
<td>1.31</td>
<td>500</td>
<td>3.82</td>
<td>1.24</td>
<td>663</td>
<td>3.77</td>
<td>1.27</td>
<td>1163</td>
</tr>
<tr>
<td>Receiving academic advising</td>
<td>4.03</td>
<td>1.24</td>
<td>502</td>
<td>4.05</td>
<td>1.18</td>
<td>663</td>
<td>4.04</td>
<td>1.20</td>
<td>1165</td>
</tr>
</tbody>
</table>
Table 23

*Multivariate and Univariate Analysis of Variance of Academic Support Measures by Generation Status*

<table>
<thead>
<tr>
<th>Multivariate</th>
<th>$F$</th>
<th>$p$</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.32</td>
<td>.214</td>
<td>.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Univariate</th>
<th>$F$</th>
<th>$p$</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you participate in this activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving instruction in my major courses</td>
<td>1.14</td>
<td>.225</td>
<td>.00</td>
</tr>
<tr>
<td>Receiving instruction in my non-major courses</td>
<td>0.92</td>
<td>.339</td>
<td>.00</td>
</tr>
<tr>
<td>Utilizing faculty availability</td>
<td>0.09</td>
<td>.765</td>
<td>.00</td>
</tr>
<tr>
<td>Making social contacts with faculty</td>
<td>0.20</td>
<td>.658</td>
<td>.00</td>
</tr>
<tr>
<td>Receiving academic advising</td>
<td>0.74</td>
<td>.390</td>
<td>.00</td>
</tr>
<tr>
<td>Does involvement in this activity promote successful academic performance?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving instruction in my major courses</td>
<td>8.20</td>
<td>.004</td>
<td>.01</td>
</tr>
<tr>
<td>Receiving instruction in my non-major courses</td>
<td>2.24</td>
<td>.135</td>
<td>.00</td>
</tr>
<tr>
<td>Utilizing faculty availability</td>
<td>0.53</td>
<td>.468</td>
<td>.00</td>
</tr>
<tr>
<td>Making social contacts with faculty</td>
<td>2.69</td>
<td>.101</td>
<td>.00</td>
</tr>
<tr>
<td>Receiving academic advising</td>
<td>0.08</td>
<td>.772</td>
<td>.00</td>
</tr>
</tbody>
</table>

In the second analysis, MANOVA was conducted to determine if mean differences existed in the levels of social support reported by first- and later-generation
students. The dependent variable of social support was measured by Likert-type scales in the questionnaire. The results of the second MANOVA suggest that statistically significant between-group differences exist in the levels of social support reported by first- and later-generation students, $V = .08, F(16, 1079) = 6.05, p < .001$. However, separate univariate ANOVAs on the measures of social support showed non-significant between-group differences in some dependent variables. Table 24 shows the mean responses and descriptive statistics from first- and later-generation students. Table 25 shows the findings of the multivariate and univariate analysis of variance concerning social support.

Table 24

<table>
<thead>
<tr>
<th>Social Support Indicator</th>
<th>First-Generation</th>
<th></th>
<th></th>
<th>Later-Generation</th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$n$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$n$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>How often do you participate in this activity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement in personal relationships with peers at Ohio University</td>
<td>3.84</td>
<td>1.28</td>
<td>537</td>
<td>4.19</td>
<td>1.07</td>
<td>703</td>
<td>4.04</td>
<td>1.18</td>
</tr>
<tr>
<td>Spending time with close friends at Ohio University</td>
<td>3.90</td>
<td>1.40</td>
<td>535</td>
<td>4.38</td>
<td>1.03</td>
<td>700</td>
<td>4.17</td>
<td>1.22</td>
</tr>
<tr>
<td>Activity</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>N</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>N</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
<td>-----------</td>
<td>-----</td>
<td>------</td>
<td>-----------</td>
<td>-----</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>Getting involved in student organizations</td>
<td>2.84</td>
<td>1.50</td>
<td>535</td>
<td>3.45</td>
<td>1.32</td>
<td>700</td>
<td>3.18</td>
<td>1.43</td>
</tr>
<tr>
<td>Attending cultural events on campus</td>
<td>2.15</td>
<td>1.25</td>
<td>537</td>
<td>2.24</td>
<td>1.17</td>
<td>697</td>
<td>2.20</td>
<td>1.21</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>2.43</td>
<td>1.27</td>
<td>535</td>
<td>2.58</td>
<td>1.23</td>
<td>698</td>
<td>2.52</td>
<td>1.25</td>
</tr>
<tr>
<td>Interacting with people of different races</td>
<td>3.98</td>
<td>1.04</td>
<td>531</td>
<td>4.04</td>
<td>0.97</td>
<td>700</td>
<td>4.01</td>
<td>1.00</td>
</tr>
<tr>
<td>Getting involved in religious activities</td>
<td>1.93</td>
<td>1.31</td>
<td>534</td>
<td>2.01</td>
<td>1.33</td>
<td>695</td>
<td>1.98</td>
<td>1.32</td>
</tr>
<tr>
<td>Having a job while enrolled</td>
<td>3.46</td>
<td>1.72</td>
<td>533</td>
<td>2.89</td>
<td>1.78</td>
<td>700</td>
<td>3.14</td>
<td>1.77</td>
</tr>
<tr>
<td>Does involvement in this activity positively impact your social experience in college?</td>
<td>4.01</td>
<td>1.23</td>
<td>494</td>
<td>4.35</td>
<td>1.02</td>
<td>664</td>
<td>4.21</td>
<td>1.13</td>
</tr>
</tbody>
</table>
Table 24 (Continued)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spending time with close friends at Ohio University</td>
<td>4.12</td>
<td>1.28</td>
<td>493</td>
<td>4.55</td>
<td>0.96</td>
<td>659</td>
<td>4.36</td>
<td>1.13</td>
<td>1152</td>
</tr>
<tr>
<td>Getting involved in student organizations</td>
<td>3.31</td>
<td>1.49</td>
<td>489</td>
<td>3.79</td>
<td>1.29</td>
<td>658</td>
<td>3.59</td>
<td>1.39</td>
<td>1147</td>
</tr>
<tr>
<td>Attending cultural events on campus</td>
<td>2.63</td>
<td>1.41</td>
<td>484</td>
<td>2.76</td>
<td>1.31</td>
<td>651</td>
<td>2.70</td>
<td>1.36</td>
<td>1135</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>2.84</td>
<td>1.40</td>
<td>486</td>
<td>2.99</td>
<td>1.33</td>
<td>656</td>
<td>2.92</td>
<td>1.36</td>
<td>1142</td>
</tr>
<tr>
<td>Interacting with people of different races</td>
<td>3.49</td>
<td>1.35</td>
<td>492</td>
<td>3.65</td>
<td>1.23</td>
<td>657</td>
<td>3.58</td>
<td>1.29</td>
<td>1149</td>
</tr>
<tr>
<td>Getting involved in religious activities</td>
<td>2.36</td>
<td>1.45</td>
<td>488</td>
<td>2.51</td>
<td>1.44</td>
<td>656</td>
<td>2.44</td>
<td>1.45</td>
<td>1144</td>
</tr>
<tr>
<td>Having a job while enrolled</td>
<td>3.14</td>
<td>1.55</td>
<td>497</td>
<td>3.02</td>
<td>1.50</td>
<td>657</td>
<td>3.07</td>
<td>1.52</td>
<td>1154</td>
</tr>
</tbody>
</table>
Table 25

*Multivariate and Univariate Analysis of Variance of Social Support Measures by Generation Status*

<table>
<thead>
<tr>
<th>Multivariate</th>
<th>F</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.05</td>
<td>&lt;.001</td>
<td>.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Univariate</th>
<th>F</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you participate in this activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement in personal relationships with peers at Ohio University</td>
<td>21.33</td>
<td>&lt;.001</td>
<td>.02</td>
</tr>
<tr>
<td>Spending time with close friends at Ohio University</td>
<td>39.08</td>
<td>&lt;.001</td>
<td>.03</td>
</tr>
<tr>
<td>Getting involved in student organizations</td>
<td>47.11</td>
<td>&lt;.001</td>
<td>.04</td>
</tr>
<tr>
<td>Attending cultural events on campus</td>
<td>2.46</td>
<td>.117</td>
<td>.00</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>4.98</td>
<td>.026</td>
<td>.00</td>
</tr>
<tr>
<td>Interacting with people of different races</td>
<td>2.18</td>
<td>.140</td>
<td>.00</td>
</tr>
<tr>
<td>Getting involved in religious activities</td>
<td>1.39</td>
<td>.239</td>
<td>.00</td>
</tr>
<tr>
<td>Having a job while enrolled</td>
<td>32.69</td>
<td>&lt;.001</td>
<td>.03</td>
</tr>
</tbody>
</table>

Does involvement in this activity positively impact your social experience in college?

| Involvement in personal relationships with peers at Ohio University | 25.68 | <.001 | .02 |
| Spending time with close friends at Ohio University | 42.45 | <.001 | .04 |
In addition to the univariate analysis, the MANOVA was followed-up with discriminant function analysis. The analysis revealed a single function that explained the variance, canonical $R^2 = .082$. This function was able to significantly differentiate between the reported social support of first- and later-generation students, $\Lambda = .92$, $\chi^2(16) = 93.27$, $p < .001$. An examination of the correlations between the outcome variable (generation status) and the function and the canonical discriminant function coefficients suggests that the frequency of involvement in student organizations ($r = .69$), positive impact from spending time with close friends ($r = .66$), and having a job while enrolled ($r = -.58$) are the best predictors of group membership. These three measures of social support not only had high correlations with the function, but also had high canonical discriminant function coefficients relative to the others.
Chapter 5: Summary, Conclusions, and Recommendations

This chapter provides a summary of the study’s purpose, data collection procedures, methods of analysis, and conclusions drawn from the analysis of data. Additionally, this chapter identifies recommendations for future research on first-generation students and policy recommendations that are derived from the findings of this study.

Summary of the Study

The purpose of this study was to explore relationships among academic and social support and academic performance of first-generation college students. The study was designed to add to the research on first-generation students by moving beyond descriptive results of first-generation students’ performance in college to an analysis of variables that influence academic performance. Specifically, the study’s focus was to explore the nature of the relationships among environmental support and students’ GPAs and if the relationships differed between first- and later-generation students.

In the study, I used the work of Bronfenbrenner (1979) and the ongoing work of Kuh (Carini, Kuh, & Klein, 2006; Kuh, 2001, 2003; Kuh, Cruce, Shoup, Kinzie, Gonyea, 2008; Kuh, Kinzie, Schuh, Whitt, 2005) to develop a theoretical perspective that appreciated both the role played by support from environments in the development of students (Bronfenbrenner) and the relationship between engagement in given environments and students’ academic performance (Kuh). The constructs of academic and social support were measured by the frequency of involvement in given activities while enrolled and if such involvement positively impacted the students’ social
experience or promoted successful academic performance. GPAs were used to represent the construct of academic performance. Data were collected from first- and later-generation students to explore how each group may be affected by academic and social support while in college.

The findings of the study are significant in that they expand the current body of knowledge on first-generation students and the disparities in their success as compared to their later-generation counterparts. The study found, as described in detail below, that first-generation students had lower GPAs than later-generation students and that first-generation students experienced lower levels of social support. The findings suggest that the academic performance of first-generation sophomore students at Ohio University is significantly lower than that of their later-generation counterparts, and that first-generation students are receiving a lower level of such support. In the next section, the findings and conclusions are discussed, and recommendations for future research and policy recommendations are provided.

**Summary of Data Analysis**

The data analysis of the study was divided into five sections. The first section gave descriptive results of the respondent data to outline the demographic and educational characteristics of the completed sample. The second section provided an analysis of student responses concerning the measured indicators of academic and social support. The focus of the analysis, however, was the analysis of data addressing the three research sub-questions designed to answer the overarching research question of the study which asks: What is the relationship among academic and social support and academic
performance of first-generation college students? A summary of each of these sections is provided below.

**Descriptive results.** The initial step in the data analysis was to describe important characteristics of the completed sample. The population of the study included sophomores at any physical campus of Ohio University and included 5233 students. The completed sample included 1278 respondents who completed the survey. Of the students who provided data, 43.4% were first-generation and 56.6% had at least one parent who completed a bachelor degree. Ohio University’s website promotes that 25% of their entering class are first-generation students, so the proportion achieved in the study was helpful in more accurately analyzing first-generation student activities and academic performance. Achieving a sufficient proportion of first-generation student responses was a concern when designing the study and the number of responses was helpful in the analysis.

The completed sample was similar to the population in that it was comprised of a large proportion of 19 through 22 year-olds, mostly female students who live on and attend the Athens campus. The proportion of students who identified as White or Black or African American were comparable as well. Also like the population data, the completed sample reported the Lancaster and Chillicothe campus as the top regional campuses of attendance and the College of Arts and Sciences and the College of Health Sciences and Professions as the two largest colleges of enrollment.
The completed sample consisted largely of students who have never been married. A majority of the respondents reported a GPA of 3.0 or above and very few were transfer students. The respondent dataset was generally representative of the population.

**Academic and social support.** The constructs of academic and social support were each measured by scales of 10 and 16 items, respectively, that were adapted from Ohio University’s Student Involvement Study questionnaire. Students were asked to report on the frequency of participation in a given activity and then report on if the activity promoted successful academic performance or positively impacted their social experience. The data were collected through two, five point Likert-type scales. The reliability of data from each scale was analyzed using Cronbach’s alpha. The alphas of the four scales ranged from .62 to .79 with three of the four scales above .70.

The analysis first provides an overview of students’ responses to items concerning social support. The aggregate data show that many students often participate in events such as being involved in personal relationships with peers, spending time with close friends, getting involved in student organizations, interacting with people of different races, and working while enrolled. In addition to frequently participating in these events, a large number of students also reported that these events positively impacted their social experience while in college.

Students reported less involvement in, and less positive impact from, attending cultural events on campus, interacting with international students, and getting involved in religious activities. Interestingly, while many students did indeed report that having a job on campus positively impacted their social experience, a large proportion of students also
reported never having a job and, as such, never being positively impacted by working while enrolled.

Concerning academic support, many students reported frequently participating in activities such as receiving instruction in major courses, receiving instruction in non-major courses, utilizing faculty availability, making social contacts with faculty, and receiving academic advising. Students not only reported being frequently involved in these activities, but that these activities often promoted successful academic performance. The largest groups of responses show that students are frequently involved in academic activities and reported that all activities promoted successful academic performance.

**Research sub-question 1.** The first research sub-question asks: What differences exist between first-generation college students and later-generation college students concerning age, race, marital status, gender, living arrangement, employment, and parenting/caregiving responsibilities? The analysis of data found that first-generation students differed from their later-generation peers concerning several of the variables in question.

The data suggest that first- and later-generation students in the sample have statistically significant differences in age; marital status; living arrangements while enrolled; the number of hours worked by students that have off-campus employment; and responsibilities in caring for children, aging parents, or other adults. Differences between the two groups in gender, hours worked on campus, and race were not statistically significant in this sample.
Overall, the data suggest that in the completed sample a statistically significantly larger proportion of first-generation students were married, live off campus, work more hours off campus, and have responsibilities to care for a child or adult other than themselves. These findings align well with the current research on first-generation college students, with the exception that no statistically significant difference was found in the race or ethnic identity with which students identify. This issue is further addressed in discussions and conclusions from the analysis.

**Research sub-question 2.** The second sub-question of this study asks: How do first-generation college students perform academically compared to later-generation college students? The study used students’ GPA as a measure of academic performance. As suggested by the sub-question the mean GPAs of first- and later-generation students were analyzed as separate groups, within college of enrollment in one analysis and within campus in another. The findings of the analysis suggest that there is a statistically significant difference in the GPAs of first- and later-generation college students.

Initially, the GPAs of first- and later-generation college students were analyzed using independent t-tests to compare the mean GPAs of the two groups. The results of the t-tests suggested a statistically significant difference did indeed exist. The GPAs of the two groups were then analyzed across college of enrollment and campus of enrollment to help account for any effects that the culture or grading norms of a particular campus or college may have on students’ GPA. The findings suggest that differences exist in the GPAs of the two groups even within the same college or campus.
Overall, generation status was found to have a main effect on GPA in that first-generation college students reported a lower level of GPA in every college except the Scripps College of Communication and at every campus except the Ironton campus.

**Research sub-question 3.** The third sub-question for this study asks: How do academic and social support relate to first-generation college students compared to later-generation college students?

The analysis performed to address this question used student responses to Likert-type scales created to measure the constructs of academic and social support. The responses were examined to determine if first- and later-generation students reported statistically significant differences in levels of academic and social support. The analysis was conducted using MANOVA including follow-up analysis using ANOVA and discriminant function analysis.

The first MANOVA conducted found no statistically significant differences in the level of academic support reported by first- and later-generation students. The second MANOVA, however, revealed a highly-significant finding in that first- and later-generation students reported different levels of social support. Further analysis showed that later-generation students indicated higher levels of social support in all but two of the 16 indicators, with the two exceptions being the frequency and positive impact from having a job while enrolled. Discriminant function analysis was used as a follow up to the MANOVA. The discriminant analysis suggested that the frequency of involvement in student organizations, positive impact from spending time with close friends, and having a job while enrolled are the best predictors of a student’s generational status.
Overall, first-generation students in the sample reported levels of academic support not significantly different than their later-generation peers. However, the data show that later-generation students received significantly more social support than first-generation students, especially when considering non-work environments.

**Discussion**

It is important that the focus of the study is not lost in the detailed discussion of analysis and addressing of the sub-questions individually. The overarching research question, which the sub-questions address, asks: What is the relationship among academic and social support and academic performance of first-generation college students? The three sub-questions were created to answer this question with the depth and context required of such a complex question. Each of the sub-questions involved a comparative analysis of first- and later-generation college students to help illuminate how the academic performance of first-generation college students may be affected by academic and social support as compared to later-generation college students.

Many of the findings of this study align with findings from previous research on first-generation college students. In the sample studied, first-generation college students were more likely than later-generation college students to be older, be married, have children, live and work off campus, work more hours, and provide care for others. First-generation students’ disproportionate involvement these activities may suggest, based on the theoretical perspective of the study, that first-generation students operate in environments that do not allow for social engagement in university settings. Given the findings Bronfenbrenner and Kuh, it is plausible to suggest that if first-generation
students report operating in environments that compete with socially engaging in university settings, their academic performance would be at a lower level than later-generation students who are more likely to operate in fewer non-academic environments and be more engaged. The findings of this study have confirmed this notion: first-generation students operate in more non-academic environments, receive less social support from many campus-based activities, and have lower levels of academic performance than their later-generation peers.

The findings show that of the students studied, those who are first-generation college students report operating in more non-educational environments, having more off-campus responsibilities, having a lower level of academic performance, and receiving less social support from where it is most needed–on the campus. Although no differences in academic support across generational status were reported, the magnitude of off-campus, non-academic responsibilities of first-generation students, the lack of social support they receive, and their lower-level of academic performance cannot be ignored.

Although many findings of the study align with other research on first-generation college student success, the findings related to the non-significant differences in academic support and significant differences in academic performance add a new perspective to the body of literature. As discussed, the value of this study is in the research’s focus on influences of academic success, not simply reporting outcomes. First-generation college students reported the same level of perceived academic support as their later generation peers yet performed at significantly lower level. This finding further emphasizes the importance of social support, and should lead research in new directions
when exploring the effectiveness of academic support, how academic support is measured, and how accurately students can gage the helpfulness of academic activities in fostering academic success.

**Conclusion**

The final conclusion of this study is that the findings suggest first- and later-generation college students in the sample report not only living different lives and operating in different environments, but that some resources provided by the university do not benefit first-generation college students to the extent that they benefit later-generation college students in terms of academic success.

First-generation students do not appear to enjoy equitable support from engaging socially in the university. This finding is important in that efforts to increase the academic performance and overall success of students through social support do not appear to be increasing the performance of first-generation college students who are in great need of the support these activities are designed to provide.

Further, although first- and later-generation students did not report significant differences in academic support, the significantly lower GPA of first-generation students suggests that first-generation students may not be as effective as their later-generation peers in translating academic activities that appear to promote academic success into improved academic performance. The combination of these two findings reinforces the need for researchers and educators to support this important group of students in effectively using academic activities to improve academic performance and to find ways to engage in social activities in the university environment.
**Recommendations for Future Research**

This study has highlighted many areas that future research should address to continue to understand and support students with the goal of being the first in their family to obtain a bachelor degree. Below are recommendations for future research that were developed based on the methods, findings, and limitations of this study.

1. Further analysis should be conducted in exploratory research to answer the overall question left by this study: How can universities provide meaningful social support to first-generation students to help improve their academic performance? Much research exists on the characteristics of first-generation students, but there is a dearth of research seeking out factors that influence academic performance. Such findings would allow researchers and advocates to focus efforts and resources on changing variables that have been empirically associated with improvements in social support and academic performance.

2. A more detailed analysis of sub-groups within the study should be conducted. The scope of this study was limited to the relationships among academic and social support and academic performance of students aggregated by generation status. The study of how groups disaggregated by variables such as age, gender, and race may illuminate important differences in the relationship among academic and social support and academic performance.

3. Research using a more comprehensive list of items or that allows individual student responses to measure academic and social support may show different levels of academic and social support within the two groups. The scope of this research focused on
the items used in the Student Involvement Survey at Ohio University. A scale developed specifically to measure academic and social support of first-generation students may prove to be a more accurate measure of academic and social support and provide findings different from those of this study.

4. Conducting a study of a similar nature with a more diverse group may yield different findings and would increase the generalizability of the findings to a wider range of students and institutions. Although no statistically significant difference was found in the race or ethnic identity of first- and later-generation college students in the sample of this study, research has shown that first-generation college students are more likely than later-generation college students to identify as an ethnic minority. Further, although the sample and the study population had similar proportions of students who identify as White and Black or African American, both groups were comprised of mostly students who identified as White. Conducting the research on a more diverse population may prove that race, age, or gender may influence the relationship among academic and social support and academic performance.

5. Alternative measures of academic performance should be considered for future studies. An examination of the relationship among academic and social support and alternative measures of academic performance may yield different results. General education assessments, GRE scores, specifically designed measures, major field tests, or other methods of measuring learning, as opposed to GPA, may add value to the discussion of learning, growth, and development as a result of academic and social support.
6. Further analysis of the varying levels of academic performance among colleges and campuses may suggest investigation is needed to explore the practices, cultures, and support mechanisms that differ among the colleges and campuses. Such research may illuminate student needs in individual colleges and campuses that could help reduce the disproportionate success of later-generation college students. This would be an opportunity to design, test, and share interventions that are associated with increased academic success with other advocates.

**Policy Recommendations**

The value of this research is not in the research itself, but in the application of findings to develop meaningful and effective interventions that will help first-generation students succeed. Below, policy recommendations based on the findings of this research are discussed to help faculty, administrators, and advocates for first-generation college students begin the process of informing practice with research.

1. The findings of this study suggest that the relationships of social support and academic performance varies across generational statuses. First- and later-generation college students reported significantly different levels of social support and academic performance. With this in mind, policymakers should appreciate that these different groups of students have different needs, and supporting successful academic performance will need to be accomplished through different methods. As such, specific programs geared toward helping first-generation college students obtain needed support should be implemented.
2. The results of this study suggest that first- and later-generation college students perform differently across colleges and campuses. Recognizing this, policymakers should refrain from implementing only university-wide approaches to helping first-generation college students and appreciate that the discipline, culture, and other college- or campus-specific characteristics may affect how first-generation students perform. In addition to university efforts, it is recommended that individual colleges and campuses assess the success and needs of first-generation students enrolled in their programs.

3. Policymakers should objectively evaluate items that may be thought of as obvious contributors to academic success. First- and later-generation students were not significantly different in their responses to questions concerning receiving instruction in major and non-major courses or utilizing faculty availability, yet first-generation students reported a significantly lower GPA. Policymakers should be sure that high-risk groups have the resources and ability to learn from instruction and not assume that simply going to class and enjoying the experience will affect academic performance. Increased skills in studying, note taking, test taking, and general success strategies might allow participation in core academic activities to increase the academic performance of first-generation students.

4. Policymakers should advocate for resources and support functions that will allow first-generation students to be more engaged in the university life. Although this may not recreate the same social experience had by later-generation students, providing means for first-generation students to engage may help connect their social activities to
increased academic performance and reduce the disparity in achievement between the two groups.
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Appendix A-Student Communications

Pre-Survey Letter

Dear Ohio University Student,

You have been selected to be part of a study exploring the effects of academic and social support on academic performance of students at Ohio University. Only a limited number of students meet the qualifications to be part of this study. As such, your participation and input is very important.

This study is being conducted for dissertation research by a doctoral student in the Patton College of Education. The study is collecting data from select students to better understand how involvement in supportive activities affects academic performance. By participating in this study, you will be helping university administrators and faculty members across the nation better understand how to support students like yourself in ways that are likely to improve students’ GPAs.

No identifiable data will be collected and your anonymity will be protected.

You’ll be receiving an invitation e-mail to complete a questionnaire for this study on Friday, January 15 from te156311@ohio.edu. If you have any difficulty with the link, please feel free to respond directly to the invitation.

Thank you for your willingness to participate and help students like yourself reach their academic goals.

Sincerely,

Thomas Eveland
Survey Cover Letter

Dear Ohio University Student,

As mentioned in a previous e-mail, you have been selected to be part of a study exploring the effects of academic and social support on academic performance of students at Ohio University. Only a limited number of students meet the qualifications to be part of this study and your name was randomly selected from this group. As such, your participation and input is very important.

The study is collecting data from select students to better understand how involvement in supportive activities affects academic performance. By participating in this study, you will be helping university administrators and faculty members across the nation better understand how to support students like yourself in ways that are likely to improve students’ GPAs.

Only the most important data is being collected. Completing the questionnaire should take no more than 5 minutes and can be done from your computer and many mobile devices.

Please take just a few minutes to share your experiences by completing the short questionnaire by clicking the link below or copying and pasting the link into your web browser.

The questionnaire can be found at: https://ohio.qualtrics.com/SE/?SID=SV_egt6eGxia7o6NaR

Thank you for your willingness to participate and help students like yourself reach their academic goals. Should you have any trouble accessing the questionnaire or have questions please contact Thomas Eveland at te156311@ohio.edu.

Sincerely,

Thomas Eveland
Student Reminder

Dear Ohio University Student,

Two weeks ago an electronic invitation was sent to you seeking your input on how academic and social support affect your GPA. Only a limited number of students met the qualifications to participate in this survey and you were selected from those who were chosen.

Thank you to those of you who have completed the questionnaire. I am very appreciative of your willingness to participate. Your input will help university administrators and faculty members better understand how academic and social support affect the GPA of Ohio University students. I appreciate your patience as protecting your anonymity requires that reminders go to the entire population.

If you have not had a chance to complete the questionnaire, it can be accessed by clicking on the link below from most devices. The questionnaire is brief and should only take about 5 minutes to complete.

No identifying data will be collected and you will remain anonymous.

Please click the link to complete the questionnaire:

https://ohio.qualtrics.com/SE/?SID=SV_egt6eGxia706NaR

Your input is invaluable. Thank you again for your willingness to participate in this important study.

Sincerely,

Thomas Eveland
Appendix B-Research Questionnaire

Social Support

The next question has two different parts. First, please rate how often you participate in each activity while here at Ohio University by selecting the best response. Second, rate your feeling about if involvement in the activity positively impacts your social experience here at Ohio University by selecting the best response. Use the following scales (You may need to scroll right if on a mobile device):

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Unsure/Don't Know</th>
<th>Sometimes</th>
<th>Very Often</th>
<th>Not at All</th>
<th>Slightly</th>
<th>Unsure/Don't Know</th>
<th>Somewhat</th>
<th>Much</th>
<th>Very Much</th>
<th>So</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement in personal relationships with peers at Ohio University</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td></td>
<td>✗</td>
<td>✗</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Spending time with close friends at Ohio University</td>
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<td></td>
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</tbody>
</table>

180
### Academic Support

<table>
<thead>
<tr>
<th>Activity</th>
<th>How often do you participate in this activity?</th>
<th>Does involvement in this activity positively impact your social experience in college?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting involved in student organizations</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
<tr>
<td>Attending cultural events on campus</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
<tr>
<td>Interacting with people of different races</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
<tr>
<td>Getting involved in religious activities</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
<tr>
<td>Having a job while enrolled</td>
<td>![Answer Options](Never Rarely Unsure/Don't Know Sometimes Very Often)</td>
<td>![Answer Options](Not at All Slightly Unsure/Don't Know Somewhat Much So)</td>
</tr>
</tbody>
</table>
The next question has two different parts. First, please rate how often you participate in each activity while here at Ohio University by selecting the best response. Second, rate your feeling about if involvement in the activity promotes successful academic performance here at Ohio University by selecting the best response.

Use the following scales (You may need to scroll right if on a mobile device):

<table>
<thead>
<tr>
<th>Activity</th>
<th>How often do you participate in this activity?</th>
<th>Does involvement in this activity promote successful academic performance?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
</tr>
<tr>
<td>Receiving instruction in my major courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving instruction in my non-major courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilizing faculty availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making social contacts with faculty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving academic advising</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Enter the year of your birth (e.g., 1994):

What is your gender identity?

- Man
- Woman
- Another gender identity
- I prefer not to respond

What is your marital status?

- Now Married
- Widowed
- Divorced
- Separated
- Never Married

What is your race or ethnic identification? (Select all that apply.)

- American Indian or Alaska Native
- Asian
- Hispanic or Latino
- Black or African American
- Native Hawaiian or Other Pacific Islander
☐ White
☐ Other
☐ I prefer not to respond

How many hours a week do you work ON campus?
☐ None
☐ 1 to 10 hours a week
☐ 11 to 20 hours a week
☐ 21 to 30 hours a week
☐ 31 to 40 hours a week
☐ More than 40 hours a week

How many hours a week do you work OFF campus?
☐ None
☐ 1 to 10 hours a week
☐ 11 to 20 hours a week
☐ 21 to 30 hours a week
☐ 31 to 40 hours a week
☐ More than 40 hours a week

Which statement best describes where you are living while attending college?
☐ Dormitory or other campus housing (not fraternity or sorority)
Fraternity or sorority house

Residence (house, apartment, etc.) within walking distance to the institution

Residence (house, apartment, etc.) farther walking distance to the institution

None of the above

What is the highest level of education completed by either of your parents (or those who raised you)?

Did not finish high school

High school diploma or G.E.D

Attended college but did not complete degree

Associate's degree (A.A., A.S., etc.)

Bachelor's degree (B.A., B.S., etc.)

Master's Degree (M.A., M.S., etc.)

Doctoral or professional degree (Ph.D., J.D., M.D., etc.)

Don't Know/Unsure

Are you the primary caregiver for any of the following (check all that apply)?

☐ Children under 18 years of age

☐ Elderly parent or other elderly adult

☐ Other adult that requires your care for basic needs

At which Ohio University campus have you completed a majority of your coursework?

☐ Athens
Cambridge
Chillicothe
Eastern (St. Clairsville)
Lancaster
Pickerington
Southern (Ironton)
Proctorville
Zanesville
Dublin
Cleveland

What is your cumulative grade point average? Please round to the nearest tenth (example 3.1 or 2.8).

Which one of the following colleges oversees the major in which you are enrolled at Ohio University?

- College of Arts and Sciences
- College of Business
- College of Fine Arts
- College of Health Sciences and Professions
- Honors Tutorial College
- Patton College of Education
- Russ College of Engineering and Technology
Did you transfer to Ohio University from another college or university?

- Yes
- No
### Appendix C-Institutional Review Board Approval

<table>
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<th>Project Number</th>
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<tr>
<td>Committee:</td>
<td>Office of Research Compliance</td>
</tr>
<tr>
<td>Compliance Contact:</td>
<td>Robin Stack (<a href="mailto:stack@ohio.edu">stack@ohio.edu</a>)</td>
</tr>
<tr>
<td>Primary Investigator:</td>
<td>Thomas Eveland</td>
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<tr>
<td>Project Title:</td>
<td>Developmental Ecology of First-Generation College Students: Exploring the Relationship between Environmental Support and Academic Performance</td>
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<td>Level of Review:</td>
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The Ohio University Office of Research Compliance reviewed and approved by exempt review the above referenced research. The Office of Research Compliance was able to provide exempt approval under 45 CFR 46.101(b) because the research meets the applicability criteria and one or more categories of research eligible for exempt review, as indicated below.

<table>
<thead>
<tr>
<th>IRB Approval:</th>
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<tbody>
<tr>
<td>Review Category:</td>
<td>2</td>
</tr>
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</table>

**Waivers: None**

If applicable, informed consent (and HIPAA research authorization) must be obtained from subjects or their legally authorized representatives and documented prior to research involvement. In addition, FERPA, PPRA, and other authorizations must be obtained, if needed. The IRB-approved consent form and process must be used. Any changes in the research (e.g., recruitment procedures, advertisements, enrollment numbers, etc.) or informed consent process must be approved by the IRB before they are implemented (except where necessary to eliminate apparent immediate hazards to subjects).
It is the responsibility of all investigators and research staff to promptly report to the Office of Research Compliance / IRB any serious, unexpected and related adverse and potential unanticipated problems involving risks to subjects or others.

This approval is issued under the Ohio University OHRP Federalwide Assurance #00000095. Please feel free to contact the Office of Research Compliance staff contact listed above with any questions or concerns.