

Spring 1-23-2019

## Investigation of Guided Study Tables as a Support for College Students with ASD in the Transition to Post-Secondary Education

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Rebecca Edgington

*Concordia University - Portland*

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Concordia University–Portland

College of Education

Doctorate of Education Program

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Investigation of Guided Study Tables as a Support for College Students with ASD in the  
Transition to Post-Secondary Education

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College of Education

Dissertation submitted to the Faculty of the College of Education  
in partial fulfillment of the requirements for the degree of  
Doctor of Education in  
Higher Education

David Kluth, Ed.D., Faculty Chair Dissertation Committee

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Concordia University–Portland

2019

## **Abstract**

The purpose of this quantitative research study was to investigate the relationship of guided study tables on the academic success and development of executive functioning skills needed for independence in the transition to post-secondary education for college students with autism spectrum disorder (ASD). Using Schlossberg's transitional theory as the theoretical framework and executive functioning skills as the conceptual framework, the study investigated a specific support of a comprehensive, transitional program available to college students to help with the transition to college. A correlational design and a descriptive survey provide foundational research and evidence connected to a specific support designed to help college students with ASD. Four semesters of data from the program, totaling 47 students, was provided for analysis including the average number of hours in guided study tables, the semester grade point average, and results from the student's program evaluation related to executive functioning skills. The results indicated participation in guided study tables positively impacted the academic success of the student with ASD. In addition, the participation in guided study tables was related to the overall independence and self-advocacy skills as noted in the program evaluation.

*Keywords:* autism spectrum disorder, higher education, supports, executive functioning, transition

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## Table of Contents

|  |      |
|--|------|
| Abstract.....  | ii   |
| Acknowledgements .....   | iii  |
| List of Tables.....  | vii  |
| List of Figures.....   | viii |
| Chapter 1: Introduction.....   | 1    |
| Introduction to the Problem.....   | 1    |
| Background, Context, History, and Conceptual Framework of the Problem..... | 2    |
| Statement of the Problem.....  | 5    |
| Purpose of the Study.....  | 6    |
| Research Questions and Hypotheses.....                                     | 7    |
| Rational, Relevance, and Significance of the Study.....                    | 8    |
| Definition of Terms.....   | 9    |
| Assumptions, Delimitations, and Limitations.....                           | 11   |
| Summary.....   | 14   |
| Chapter 2: Review of the Literature.....                                   | 16   |
| Introduction to the Literature Review.....                                 | 16   |
| Complexity of Autism Spectrum Disorder.....                                | 18   |
| Conceptual Framework and Theoretical Framework .....                       | 23   |
| Transition process.....  | 24   |
| Taking stock of coping resources.....                                      | 25   |
| Review of Research Literature and Methodology.....                         | 26   |
| Review of Methodological Issues.....                                       | 34   |

|  |    |
|--|----|
| Synthesis of Research Findings.....                              | 37 |
| Critique of Previous Research.....                               | 39 |
| Summary.....   | 39 |
| Chapter 3: Methodology.....                                      | 42 |
| Introduction to Methodology.....                                 | 42 |
| Purpose of the Study.....  | 43 |
| Research Questions.....  | 43 |
| Hypotheses.....  | 44 |
| Research Design.....   | 44 |
| Target Populations, Sampling Method, and Related Procedures..... | 46 |
| Instrumentation.....   | 47 |
| Data Collection.....   | 48 |
| Operationalization of Variables.....                             | 50 |
| Data Analysis Procedures.....                                    | 52 |
| Limitations and Delimitations of the Research Design.....        | 54 |
| Internal and External Validity.....                              | 56 |
| Expected Findings.....   | 57 |
| Ethical Issues in the Study.....                                 | 58 |
| Summary.....   | 59 |
| Chapter 4: Results.....  | 61 |
| Introduction to the Results .....                                | 61 |
| Description of the Sample.....                                   | 66 |
| Summary of the Results.....                                      | 73 |

|  |     |
|--|-----|
| Validity.....  | 75  |
| Reliability.....   | 78  |
| Detailed Analysis.....   | 80  |
| Research question 1.....   | 80  |
| Research question 2.....   | 82  |
| Summary.....   | 89  |
| Chapter 5: Discussion and Conclusions.....                       | 91  |
| Introduction to the Discussion and Conclusions.....              | 91  |
| Summary of the Results.....                                      | 93  |
| Discussion of the Results.....                                   | 97  |
| Discussion of the Results in Relation to the Literature.....     | 100 |
| Limitations.....   | 104 |
| Implication of the Results for Practice, Policy, and Theory..... | 106 |
| Recommendations for Further Research.....                        | 110 |
| Conclusion.....  | 113 |
| References.....  | 116 |
| Appendix A: Demographic Information Survey.....                  | 130 |
| Appendix B: Consent for Anonymous Survey (Click Consent).....    | 133 |
| Appendix C: E-mail recruitment letter.....                       | 134 |
| Appendix D: STEP Evaluation Form.....                            | 135 |
| Appendix E: Statement of Original Work.....                      | 136 |

## **List of Tables**

|   |    |
|---|----|
| Table 1 <i>Sample Student with ASD Demographics</i> .....   | 67 |
| Table 2 <i>College and Employment of Students with ASD from Descriptive Survey</i> .....  | 69 |
| Table 3 <i>Parent’s Household Income and Educational Level</i> .....  | 70 |
| Table 4 <i>Student Supports</i> .....   | 71 |
| Table 5 <i>Declared Majors and Minors of Students with ASD</i> .....  | 72 |
| Table 6 <i>Summary of Individual Semesters and Data to Correspond with Program Evaluation Questions</i> .....                               | 86 |
| Table 7 <i>Summary of Fall Semesters Compared to Spring Semesters with Data Corresponding to GPA and Program Evaluation Questions</i> ..... | 87 |
| Table 8 <i>Means and Standards Deviations of Data</i> .....   | 88 |

## List of Figures

|   |    |
|---|----|
| Figure 1 <i>Scatter plot of the number of hours in guided study tables and the semester grade point average.....</i>                | 82 |
| Figure 2 <i>Scatter plot of number of hours in guided study tables and the score on the program evaluation for question 11.....</i> | 84 |

## **Chapter 1: Introduction**

### **Introduction to the Problem**

The prevalence of autism spectrum disorder (ASD) is 1 in 68 individuals (Centers for Disease Control and Prevention, 2016). Improvements in early identification, early intervention, and inclusive education have resulted in students with ASD graduating from high school and transitioning to employment or post-secondary education. Wei, Wagner, Hudson, Yu, and Javitz (2016) reported 49,000 students with ASD graduated from high school in the 2014-2015 school year. However, Shattuck et al. (2012) reported the national survey data for young adults with ASD had the highest rates of “no participation” in employment or post-secondary education compared to the other disability categories.

With the increase in students eligible for post-secondary education, research has indicated students with ASD need additional supports in the transition from high school to post-secondary education (Gobbo & Shmulsky, 2014; Pinder-Amaker, 2014; Toor, Hanley, & Hebron, 2016; Van Hees, Moyson, & Roeyers, 2015). Students face challenges with communication inside and outside the classroom, daily living skills, emotions, self-advocacy, and social interaction (Cox et al., 2017). Overall, Volkmar and Wolf (2013) noted students with ASD struggle to generalize skills to new settings.

In response, colleges have started to recognize the need for providing additional supports or programs for students with ASD. The critical problem lies in the lack of empirical literature addressing evidence-based interventions and the implementation of supports at the college level. Research is limited regarding quantitative data to determine the impact of the supports and programs especially in relationship to outcome data or academic success (Kuder & Accardo, 2018). The purpose of this study is to investigate the relationship of a specific support in

relationship to academic success and the development of executive functioning skills needed for independence at the university setting for students with ASD in a comprehensive, transitional program at one university.

### **Background, Context, History, and Conceptual Framework for the Problem**

Autism Spectrum Disorder (ASD) is a development disorder characterized by social communication difficulties and restricted repetitive behaviors (American Psychiatric Association, 2013). Students with ASD are successfully completing high school and are eligible for college or careers. However, the characteristics associated with ASD present numerous challenges for students transitioning to post-secondary education.

The characteristics directly related to ASD can directly impact the success of the student in the college setting. For example, studies discussed the “hidden curriculum” of college involving the day-to-day expectations not clearly stated in orientations, syllabi, websites, or catalogs (Hewitt, 2011). Understanding the verbal and nonverbal language incorporated in the classroom environment and residence halls place additional demands on students with ASD (Cai & Richdale, 2016). The transition can present numerous challenges and when not addressed the students are also at greater risk for mental health concerns (Magiati, Tay, & Howlin, 2014; Volkmar & Wolf, 2013).

Research has concluded from a variety of stakeholders (i.e. students, family members, faculty, support services) that students with ASD require additional supports in the areas of academics, social, and daily living skills to be successful in the college setting (Austin & Peña, 2017; Cai & Richdale, 2016; Van Hees et al., 2015). Therefore, colleges and universities are incorporating more programs and supports to assist college students with ASD. However, the research is lacking regarding the review of the supports and impact on the outcome data.

Parents, students, university stakeholders, and program staff need direction and guidance to ensure the students with ASD are properly supported during the college experience.

The current statistics pertaining to graduation rate and employment post high school are bleak for individuals with ASD. Utilizing the National Longitudinal Transition Study 2 (NLTS2) data, multiple studies have indicated the need to implement supports and opportunities that will improve the post high school experiences of students with ASD (Burgess & Cimera, 2014; Grigal, Hart, & Migliore, 2011; Wehman et al., 2014). Shattuck et al., (2012) concluded that youth with ASD had the lowest rates of employment and the highest overall rates of no participation in work or school post high school compared to other disability categories. Research needs to connect results to outcome data related to academic success, graduation rates, and competitive employment.

The need for quantitative research is crucial in the investigation of college supports for students with ASD. Numerous qualitative studies have been completed gathering information from surveys, interviews, and questionnaires (Anderson & Butt, 2017; Barnhill, 2016; Brown & Coomes, 2016) to initiate the investigation of supports on campus for college students. Kuder and Accardo (2018) stressed the importance of future research focusing on “effective methods for enhancing the college experience and college outcomes of students with ASD” (p. 730).

Thus far, research has focused on self-determination and self-advocacy skills, but even with this start, specific strategies and methods are lacking. In addition, the transition to college presents challenges different from the consecutive semesters. The complex aspects of ASD needs further research to investigate both the transition, continuous expansion of cognitive skills, and the bridge to employment. Frequently, faculty, family members, and students recognize the need for support in the area of social skills and executive functioning skills specifically time

management, organization, and prioritizing (Gobbo & Shmulsky, 2014; Hansen, 2011; Knott & Taylor, 2013). Whereas, throughout the college experience, students need to develop additional skills to be independent, successful, and prepared for life post college.

Executive functioning skills in students with ASD can provide the foundational skills for the student to be independent, goal-directed, and guide behaviors. Past research studies have focused on peer supports, social activities/involvements, problem solving skills, and decision making for students with ASD in the college setting (Ames, McMorris, Alli, & Bebko, 2016; Ashbaugh, Koegel, & Koegel, 2017; Levin et al., 2015; Pugliese & White, 2014; Roberts & Birmingham, 2017; Wenzel & Rowley, 2010). Self-determination and self-advocacy continue to be skills necessary while students are in college to successfully meet the challenges (Getzel & Thoma, 2008), however the transition to the college environment involves developing the necessary executive functioning skills to cope with the new situations, self, supports, and strategies. Therefore, the specific support that was isolated for this study involved assisting in the development of executive functioning skills rather than the other characteristics associated with autism.

Guided study tables as a college support in the transition to the post-secondary educational setting provided regular, consistent interaction to assist the student in coping with the new situation, develop supports and strategies for success, and develop a positive view of self. In addition, student mentors of the program had direct contact with the students with ASD during guided study tables. Positive interaction and participation in guided study tables were projected to impact academic success and establish executive functioning skills crucial for the college environment.

Therefore, the conceptual framework for the study investigated the executive functioning skills of college students with ASD needed in the new environment. As stated in Diamond (2014), executive functioning skills “account for more than two times more variation in final grades than does IQ, even in college” (p. 206). Therefore, regardless of intelligence, colleges students with ASD need to establish and generalize executive functioning skills in the transition to post-secondary educational setting. Guided study tables was one specific support created to assist in the transition to the university.

College supports needed in the transition to post-secondary education may differ from other supports offered continuously or throughout the college experience. Therefore, the program selected for the study offers a comprehensive, transitional program along with less intensive programming is available upon completion of one semester in the transitional program and with recommendation from staff of the program. The guided study tables are required in the transitional program and available to the students in the other program option. Research lacks in the investigation of evidence-based practices at different levels or stages of the college years. The current study provided additional information to the program about the supports in place to assist with future planning, and the study contributed to the limited research on college students with ASD.

### **Statement of the Problem**

The lack of empirical research on effective intervention or supports for college students with ASD presents a problem to university personnel and administration implementing programs. Additionally, families have minimal evidence or statistics to support making decisions regarding the selection of institutions. The needs of the students with ASD have been identified and programs or supports have been established but research is now needed to

investigate the results in relationship to the outcome data of the students in addition to specific skills needed for independence.

Additional research is needed to investigate specific supports designed to assist college students with ASD. College stakeholders are willing to provide services to help students with ASD in the college setting, but the problem is implementing evidence-based practices that are researched to be effective in improving outcome data. Previous research has incorporated intervention focused on social skills, peer mentors, and problem solving, however executive functioning skills is lacking in the research for college students with ASD. Therefore, the current study isolated a single support (guided study tables) designed to support academic success and the development of executive functioning skills necessary in the transition to the college setting to be independent in the new environment.

### **Purpose of the Study**

The purpose of this quantitative, correlational study was to investigate the relationship of one specific support to the impact on academic success and the development of the executive functioning skills of the students with ASD transitioning to the university setting. The variables in the study incorporated the number of hours in guided study tables, the student's semester grade point average, and the Likert scores on the program evaluation completed at the end of each semester related to executive functioning skills. The study incorporated concrete data from one program rather than the viewpoints, opinions, and efficiency of the support.

Additionally, a descriptive survey was completed by previous and current students in the transition program to help gather additional information about the students with ASD attending college and seeking out supports at the institution. The study will provide additional information

to university administration, parents, students, and program personnel for future planning and implementation of supports.

The study was designed to contribute to the growing need of developing and implementing evidence-based practices for college students with ASD. The spectrum of the disorder and varying needs of each individual requires an extensive amount of research to help in the process. The current study focused on specific support while trying to determine if the support can be directly related to the academic success or development of necessary skills to be successful on the college campus.

### **Research Questions and Hypotheses**

The following research questions were investigated in this study:

RQ1: What is the relationship between guided study tables and the academic success (G.P.A.) of students with ASD in a transitional, comprehensive program?

RQ2: What is the relationship between participation in the guided study tables and development of executive function skills needed for independence on the college campus?

### **Null hypothesis.**

NH1: There is no relationship between the number of hours of guided study tables and the academic success of the students.

NH2: There is no relationship between the number of hours of guided study tables and the level of independence related to executive functioning skills in the college setting.

**Alternative hypothesis.**

AH1: There is a relationship between the number of hours students record in guided study tables and the academic success of the student with ASD.

AH2: There is a relationship between the number of hours of guided study tables and the independence level of executive function skills for college students with ASD.

**Rational, Relevance, and Significance of the Study**

Investigating one specific support of a comprehensive program provided a starting point to investigate effective supports to incorporate while also focusing on expanding the quantitative studies involving college students with ASD. The established program provided multiple semesters of data to analyze collectively and individually to contribute to future considerations when examining supports for college students with ASD. Lastly, the concrete data incorporated hours recorded by students, the grades assigned by faculty, and the results of the program evaluation completed by administration/staff of the program. The connection to academic success and the focus on skills necessary for independence on the college campus contribute to the future outcome data of the student with ASD.

The results of the study provided additional information to university stakeholders, parents, students with ASD, and program personnel for future planning. Students with ASD eligible for college need the opportunity to be successful in post-secondary education. The characteristics associated with ASD impact the transition to college include social communication, pragmatics, co-morbid conditions, perspective taking, and executive functions. The study started to isolate a specific, unique support incorporated in the transition to the college environment designed to focus on academic success and target specific characteristics while focusing on the outcome data for students with ASD.

In the transition to college, executive functioning skills impact academic success. Failure can be directly related to deficits with executive functioning skills (Hewitt, 2011). Whereas, retention is related to the connections and social integration in the new environment. The ability to develop routines, organize information, manage time, initiate tasks, and complete activities impact all aspects of adolescents and adulthood. Executive functioning skills are a collection of cognitive processes needed for self-determination and goal attainment. In the transition to college, executive functioning skills are important. The student development theory, Schlossberg's transition theory, recognized the need to assist students first in the transition to college which involves new roles, routines, and relationships (Barclay, 2017). The student's adjustment to the new environment and support to generalize established skills from high school to college supports the theoretical framework of needing to develop the student in the transition to post-secondary education. The implementation of guided study tables assist students with ASD in developing executive functioning skills while also supporting Schlossberg's transition theory.

### **Definition of Terms**

**Academic success.** This term is used to define the academic achievement of students in the educational environment. Post-secondary education measures this achievement through grade point average, retention rates, graduation rates, and employment rates (Hewitt, 2011; Wehman et al., 2014).

**Autism Spectrum Disorder (ASD).** Within this study, Autism Spectrum Disorder (ASD) incorporates all diagnoses associated with ASD including Pervasive Developmental Disorder, Pervasive Developmental Disorder—Not Otherwise Specified, Asperger's Syndrome, High Functioning Autism, and Autism (Ness, 2013).

**College supports.** Campus services available to students enrolled at the institution to help with a variety of issues or needs (i.e. health, personal, or social) (Cullen, 2015).

**Comprehensive, transitional program.** A fee-based program available at universities for students with ASD to support academics, social, and daily living skills. The supports exceed the requirements of the American's with Disabilities Act (ADA). The program consisted of approximately 10 contact hours a week with staff or mentors involved with the program (Richard, Edgington, & Xenakis, 2016).

**Executive functioning skills.** This term is defined as the collection of cognitive skills, located in the frontal lobe, responsible for successful engagement in complex, novel, and goal-oriented behaviors (Jones et al., 2018). Tasks associated with executive functioning skills include planning, inhibition, time management, cognitive flexibility, self-advocacy, self-awareness, working memory, self-monitoring, and organization (Fehy & Richard, 2016).

**Guided study tables.** One specific support offered in the comprehensive, transitional program. Students in the program agree to participate in six hours of guided study tables a week while in the program. A minimum of two student mentors are present during the supported hours, and students with ASD are required to log the time in attendance (Richard, Edgington, & Xenakis, 2016).

**Post-secondary education.** Education received at colleges, universities, or vocational/technical schools governed by federal laws Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (Barnhill, 2016).

**Student program evaluation.** A non-standardized, Likert scale evaluation created by the administration of the program to rate the student's level of independence on the college campus

at the end of each semester. The results of the evaluation are shared with the student and families with a recommendation for the next semester (see Appendix D).

**Schlossberg's transition theory.** Schlossberg defined transition as “a transition as any event, or non-event that results in changed relationships, routines, assumptions, and roles” (Barclay, 2017, p. 46). The 4 S's, situation, self, support, and strategies, influence the individual's ability to cope with a transition.

**Self-advocacy.** The ability to speak or act on one's needs to improve quality of life and make decisions about supports necessary to become autonomous, self-determined individuals (Van Reusen, 1996).

**Student mentors.** Undergraduate or graduate level studies attending the same institution who voluntarily choose to participate with the comprehensive program. The student mentors participate in a mentor orientation and commit to approximately five hours a week of volunteer work for two semesters. Regular training or communication is incorporated through weekly group mentor meetings (Roberts & Birmingham, 2017).

**Transition.** The term used to describe the passage from one stage to another. In students with disabilities, transition refers to the systematic, individual process necessary to positively shift to change, situations, and environments (Migliore, Timmons, Butterworth, & Lugas, 2012).

### **Assumptions, Delimitations, and Limitations**

Several assumptions were made in the development of this study. First, the students in the program were assumed to record accurately the number of hours participating in guided study tables. Second, the data collected from the director of the comprehensive, transition program was assumed to be free of errors, referring to the data recorded, entry, and calculations. Additionally, the grades posted for each individual class to calculate the grade point average was

an appropriate representation of achievement in the classroom setting. Finally, the responses from the descriptive survey were answered truthfully and without deception.

The participants in the study were assumed to be prepared for post-secondary education. Students in the comprehensive, transitional education program were admitted to the university on their own merit through the regular application process. No special admits or at-risk candidates to the university were recommended to participate in the program. Next, the students submitted documentation to the disability services documenting the diagnosis ASD or other related categories (i.e. autism, high functioning autism, or Asperger's). Upon confirmation from admissions and the disability services, students demonstrating interest in the program are admitted to the fee-based program. Campus visits and interviews are recommended but not required for acceptance to the program at the time of the study. No additional test scores, testing, or baseline data are necessary for admission to the program. Therefore, the students admitted to the program present the same risk of college students for retention and success at the institution.

Delimitations of the study also existed. The size of the sample was limited to the number of students with ASD enrolled in the program at one specific university. The university is located in a rural, mid-west community. The study was specific to one institution at this time. However, the design of this study can be replicated by other schools with similar supports or programs.

Limitations of the study included the number of students in the study. The resources to the program were limited in turn impacting the maximum capacity of students in the program. At the time of the study, the program capacity was 10-15 students. The sample of students with ASD was limited to the individuals researching, seeking out, and accessing fee-based supports at that specific institution. There are other students with ASD enrolled at the university not

utilizing or enrolling in the comprehensive, transitional program. In addition, marketing of the program was limited to word of mouth, internet searches, and website. During the early years of the program being established, the resources and staff to the program were limited impacting the outreach and recruitment of students. The sample is also limited due to the majors and minors offered at the one institution. Some inquiries of the program were seeking out specific degree programs not currently offered. The sample utilized for the study was both convenient to the researcher and a realistic study of implementing supports for established students at an institution. The sample provided a starting point for possible future research regarding transitional supports to implement for college students with ASD in the transition to higher education.

Another limitation of the study was isolating one component of the comprehensive program. Students were required to participate in a minimum of six hours of guided study tables, but on average students in the program averaged 10 hours of contact time per week with program staff/mentors. Therefore, the results of the study can be impacted by other factors and aspects of the program. As a starting point, guided study tables was chosen due to the regular contact with the students with ASD, the uniqueness of the support compared to other research studies, and the ease in which other institutions could implement as a feasible support for college students transitioning to the college setting.

Guided study tables were monitored by student mentors. The manner in which executive functioning skills were facilitated during the guided study tables varied based on the comfort, background, and experience of the student mentors. The characteristics and interactions of the mentors were not incorporated into the study. All mentors received the same mentor orientation and participated regularly in the weekly group mentor meetings with program administration.

The program supported 14 hours of guided study tables weekly with two mentors assigned to a designated guided study table time.

The data incorporated into the study was carefully selected. The number of hours in guided study tables was recorded by students in the program, whereas the grade point average is calculated by the assigned grades from individual instructors. Lastly, the executive functioning skills score from the semester program evaluation tool was determined collectively by four administration/staff of the program. The staff of this specific program were speech-language pathologists and graduate assistants in Communication Disorders and Sciences with expertise and experience with ASD and executive functioning skills. Even though the researcher is employed through the university and works in connection with the program, the design specifically incorporated objective data from a variety of sources while looking for relationships rather than effectiveness or feasibility.

## **Summary**

Autism Spectrum Disorder continues to be an important topic to research in order for families, friends, and professionals to understand effective strategies and intervention techniques. As students with ASD receive appropriate, evidenced-based practices, the more likely post-secondary education will be an achievable goal. As universities are developing supports and programs to attract students with ASD, additional research is imperative to determine evidence-based practices for college success.

This quantitative research study investigated one specific support, guided study tables, at one university to initiate the exploration of supports in relationship to academic success and development of executive functioning skills in the transition to the college setting. The correlational design provided evidence for a feasible support for institutions to implement to

assist with impacting academic success and targeting executing functioning skills in the transition to college. The executive functioning framework specifically focuses on the need for supports in the transition to post-secondary education.

Chapter 1 introduces the topic of study and importance to study supports designed for college students with ASD. The research is a positive addition to the field while also benefitting families seeking out programs and the universities working to support the students with ASD. Chapter 2 provides the Literature Review of the topic and contains the conceptual framework specifically designed for the study. Chapter 3 outlines the methodology utilized for this quantitative, correlational study. Chapter 4 presents the results and analysis of the data in response to the research questions. Lastly, Chapter 5 offers the discussion and conclusions of the study including limitations, implications, and recommendations.

## **Chapter 2: Literature Review**

### **Introduction to the Literature Review**

The prevalence of Autism Spectrum Disorder (ASD) is currently 1 in 68 individuals and ASD is more common in males than females with a four to one average (Centers for Disease Control and Prevention, 2016). Over the years, the Diagnostic and Statistical Manual of Mental Disorders (DSM) classified the characteristics and symptoms of ASD as Pervasive Developmental Disorder (PDD), Pervasive Developmental Disorder—Not Otherwise Specified, Asperger's Syndrome, High Functioning Autism, and Autism. Currently, the fifth edition of the DSM (American Psychiatric Association, 2013) revised the criteria for Autism Spectrum Disorder with specific criteria in the areas of social communication and social interaction and restricted, repetitive patterns of behaviors with varying levels of severity. The diagnosis of ASD results in a complex disorder with various cognitive levels, strengths, weaknesses, and educational needs.

Increased knowledge of the disorder has resulted in early identification, early intervention services, inclusive education, and additional supports to prepare students with ASD for careers or college readiness (Cox et al., 2017; Magiati et al., 2014). The option of post-secondary education or gainful employment should be available for young adults with ASD who have the intelligence quotient (IQ) and potential to participate. Therefore, institutions of higher education need to examine its strategies for accepting and supporting students with ASD while also investigating innovative and creative supports to maximize resources to meet the needs of the future generations.

Even though students have the potential for success in post-secondary education, the outcome data for students with ASD is bleak. The current outcome data for young adults with

ASD indicated that the employment rate ranged between 4.1% and 11.8% and only 14% had earned a postsecondary degree (Taylor & Seltzer, 2011). In addition, only 10% of the young adults with ASD received college services (Burgess & Cimera, 2014). However, the strongest predictor of employment and earnings was postsecondary education (Migliore et al., 2012). Based on the data, improved transitional planning and services are necessary (Shattuck et al., 2012).

The transition from high school to higher education presents numerous changes for all students, and students with ASD experience additional challenges due to difficulty generalizing skills to a variety of settings (Volkmar & Wolf, 2013). Despite the intellect of students with ASD, the new environment presents novel experiences that need to be considered and supported. Preliminary research indicated that students with ASD need additional supports above and beyond the accommodations required by the Americans with Disabilities Act (ADA) or Section 504.

Programs and supports have been created based on needs assessment research, but the literature to support outcome data and academic success are lacking. Overall, evidence-based intervention is lacking for adults with ASD which is an obstacle when implementing supports at the college level. The lack of research negatively impacts the stakeholders (i.e. students, parents, faculty, staff, and service providers) who need to know what supports effectively meet the needs of the student for future planning.

A comprehensive, transitional program created at a state, public university in the mid-west supports students with ASD in higher education. A unique aspect of the program includes guided study tables. Guided study tables assist with designating time to complete academic work while also providing support specifically with the executive functioning skills to mentally

complete work and address time management, attention, organization, execution, and completion. Even though the complex disability of ASD presents many challenges, the unique syndrome needs unique accommodations (Smith, 2007), and guided study tables present a unique support that needs quantitative data to evaluate the effectiveness of this component of the comprehensive program. The supports available in post-secondary education for students with ASD need empirical research to provide evidence for effective intervention.

Chapter 2 is divided into four sections. The background on ASD and the complexity of the disability are presented identifying the multiple deficit areas students with ASD can present with that can impact performance within post-secondary education. Then, the conceptual framework of the study, specifically the executive function skills necessary for college success, provides the foundation for the study. In addition, the theoretical framework is identified connecting the need to develop the executive function skills necessary for independence especially in the transition to college as outlined in Schlossberg's transition theory. Students with ASD need to demonstrate and establish the necessary foundational skills to be successful in the transition to post-secondary education. Next, the review of research literature and methodology provide insight into the limited amount of evidence-based practices available to support the challenges for students with ASD especially in the transition to the college setting. Lastly, the synthesis and critique of previous research will demonstrate the justification for the current research study specifically outlining the lack of quantitative research connected to specific supports and outcome data for students with ASD.

### **Complexity of Autism Spectrum Disorder**

An increase in the prevalence of autism spectrum disorder (ASD) has resulted in a greater number of adults with ASD. In 2000, the Centers for Disease Control and Prevention (2016)

reported the prevalence of ASD was 1 in 150 (the birth year 1992), whereas in 2012, about 1 in 68 children (the birth year 2004) were identified with ASD. Children with ASD grow to become adolescents and adults with ASD. Therefore, colleges will continue to see an increase of students diagnosed with ASD. Cox et al. (2017) estimated over 400,000 students with ASD will be college-aged in 2020. Individuals with ASD present with unique deficits impacting language, social interaction, and repetitive/rigid behaviors. Research in the early years of development and school-aged children has been well researched, but the impact autism has in late adolescence and adulthood is significantly less discussed in the research (Anderson, McDonald, Edsall, Smith, & Taylor, 2015; Killenburger, Jordan, & Mc Kerr, 2016; Mulder & Cashin, 2014). Volkmar and Wolf (2013) identified the lack of research as a significant obstacle and identified the difficulty for individuals with ASD to generalize skills to the “real world” setting which can require continued supports into adulthood.

An Individualized Education Plan (IEP) incorporated from three years of age until graduation from high school provides supports, accommodations, related services, special education classes, and goals to ensure a quality education for a child with a disability. Preparation and readiness skills for post-high school students should be addressed in the transition plan. Transition planning from high school to college plays a vital role to assist with planning and student based goals (Grigal et al., 2011). However, the difference between high school and college is extreme for students with ASD due to the new living arrangements, expectations, independence, social situations, level of coursework, and flexibility of schedule. Students diagnosed with ASD and their families are not always prepared for post-secondary education. The Americans with Disability Act (ADA) requires academic supports for college students with a documented disability. Previous research revealed students have had negative

experiences with receiving adequate support at the college level (Cai & Richdale, 2016; Cullen, 2015; Van Hees et al., 2015). Therefore, regardless of the intellectual ability of the students with ASD, the transition from high school to post-secondary education presents numerous challenges.

Students with ASD entering college experience several challenges that require additional supports to be successful. The complexity of ASD impacts success in higher education. Young adults diagnosed with ASD present with the core features of ASD along with co-morbid conditions, delays in the theory of mind, and executive function deficits. Universities need to understand ASD and provide the necessary accommodations to maximize the success of the students in higher education (Anderson et al., 2015; Cox et al., 2017).

The core features must be present to medically diagnose ASD. The clinical diagnosis of ASD involves impairments of social communication and repetitive/restrictive behaviors at varying levels of severity. The criteria listed in the DSM-V for ASD reads as follows:

- a. Persistent deficits in social communication and social interaction across contexts as manifested by the following in development or currently
  - Deficits in social-emotional reciprocity
  - Deficits in nonverbal communication behaviors used for social interaction
  - Deficits in developing and maintaining relationships
- b. Restricted, repetitive patterns of behavior, interests, or activities, as manifested in at least two of the following areas:
  - Stereotyped or repetitive speech, motor movements, or use of objects
  - Excessive adherence to routines, ritualized patterns of verbal or nonverbal behaviors, or excessive resistance to change
  - Highly restricted, fixated interests that are abnormal in interest or focus

- Hyper-or hypo-reactivity to sensory input or unusual interests in sensory aspects of environment (American Psychiatric Association, 2013, p. 50)

ASD is a developmental disorder with varying levels of severity and the symptoms together limit and impair everyday functioning. Higher severity levels of ASD characteristics result in greater difficulty with adjusting to the college environment (Trevisan & Birmingham, 2016). New social demands and changes that exceed limited capacities can cause the symptoms to manifest especially when student transitions from high school to postsecondary education. Social communication deficits, in addition, to need for sameness and routine impact participation on college campuses and daily living skills (Cullen, 2015; Knott & Taylor, 2013; Weiss & Rohland, 2015). When designing supports, the strengths and weaknesses associated with the core characteristics of ASD should assist in the formation and evaluation of programs.

Besides the core features of ASD, individuals also experience co-morbid conditions. The mental health problems exasperated during the college experience including anxiety, obsessive-compulsive disorder (OCD), emotional disorders, and depression make other challenges involving academics, social interaction, and daily living even more complicated (Cai & Richdale, 2016). College students with ASD experienced loneliness, depression, and isolation when enrolled in college (Gelbar, Smith, & Reichow, 2014). Research revealed that co-morbid factors were the rule rather than the exception when it comes to students with ASD in post-secondary education (Weiss & Rohland, 2015). The persistent problems with social isolation and communication in new environments can also increase the risk for anxiety and depression (Volkmar & Wolf, 2013). The co-morbid conditions negatively impact the new stressful situations post-secondary education presents to students with ASD.

In connection with the core social communication deficits and co-morbid conditions, perspective taking and understanding mental states (theory of mind) present additional challenges at the college level. Perspective taking impacts socialization skills and understanding the perspectives of others (Kleinman, Marciano, & Ault, 2001). In the new educational environment, the need to recognize the views, opinions, and thoughts in various contexts occur in the classroom, living environment, and throughout campus. Perspective taking is closely related to the social communication deficits of the core characteristics in terms of students having difficulty reading the social situation, understanding the hidden rules of interactions, and interpreting the verbal and nonverbal information presented (Freedman, 2010).

Lastly, executive functioning skills impact the college success for students with ASD. Executive functions are the mental processes to self-regulate throughout the day (Fehy & Richard, 2016). Therefore, the executive dysfunctions of the student with ASD impact staying organized, focusing on tasks through completion, the ability to manage time and multi-task throughout the semester. Other areas of deficits impact by executive dysfunction include deficits with problem-solving, initiation, planning, organization, completion, time management, working memory, and self-determination. The challenges associated with executive functions can negatively impact college performance. For example, students may have difficulty deciding on a topic, organizing the information, staying on task to complete and submit the assignment, and self-regulate to initiate and work on the project. In the transition to college, students need to establish new routines and structures in the new environment to assist with the executive functioning skills (Barnhill, 2016; Brown & Coomes, 2016; Gillespie-Lynch et al., 2017).

## **Conceptual Framework and Theoretical Framework**

The conceptual framework for the study specifically focused on the development of the executive functioning skills (i.e. initiating, planning, organizing, task completion, and problem-solving) necessary for the transition to the new educational environment. Developing the foundational executive functioning skills while building upon the student's need for routine and structure associated with the restricted, repetitive behaviors of the core features of ASD will then assist students with managing co-morbid conditions which in turn could assist in developing social communication and theory of mind. Transitional skills need to be established first to develop the student at the college level to then later focus on cultivating other levels of development. A hierarchy of services may need to be developed to better serve students with ASD in post-secondary education.

Recent research on college students with ASD emphasized the need for self-determination, however, self-determination is only one aspect of executive functioning skills (Getzel & Thoma, 2008; Hatfield, Falkmer, Falkmer, & Ciccarelli, 2016; Wei et al., 2016). Goal setting can be difficult for students who have never experienced the college setting or established the routines and expectations necessary for success. The complexity of the diagnosed disability and the multiple components need to be considered especially in the transition to higher education. The core features of ASD, co-morbid conditions, theory of mind, and executive functions impact the success of the college student with ASD. Therefore, as the student transitions from high school to college, student development theories specifically the Schlossberg's transition theory provide the functional, foundational skills and awareness necessary in the first semester to then later develop additional skills necessary throughout

college. Transitional supports and programs may need to differ compared to on-going, continuous supports.

The challenges related to the diagnosis of ASD can impact the student's transition to post-secondary education. Therefore, the theoretical framework for this study incorporated Schlossberg's transition theory which is classified as a student development theory into the organization of the research. Multiple supports are beneficial, and the need to determine the hierarchy of services throughout the college experience will continue to benefit the students with ASD.

Schlossberg's transition theory recognized that transition involves new roles, routines, and relationships which need to be developed and supported (Barclay, 2017). Schlossberg presented a transition model which provided a systematic framework to assist professionals in supporting the adjustment to college. The model incorporated transition process and taking stock of coping resources (Schlossberg, Waters, & Goodman, 1995).

**Transition process.** Transitions can be anticipated and unanticipated. Students with ASD recognize certain transitions will occur upon entering higher education, however, not everything can be anticipated, and the students need assistance with developing the skills as they progress through the transition process. Transitions for students can cause feelings of marginalization and dissonance (Barclay, 2017) which could heighten the areas already involved with the complexity of the ASD diagnosis. The time necessary for transition varies as a student progresses from moving in, moving through, and moving on in the transition to the new college environment. Establishing the routines and structures to help in the adjustment will allow greater independence and success.

Barclay (2017) summarized the transition process in the following three ways:

1. Adults continuously experience transitions.
2. Adults' reactions to transitions depend on the type of transition, the context in which it occurs, and its impact on their lives.
3. A transition has no endpoint; rather a transition is a process over time that includes phases of assimilation and continuous appraisal as people move in, through, and out of it. (p. 46)

Therefore, transitional supports should be considered a priority to ensure the new roles, routines, and relationships have been established to then later focus on other areas of student development.

**Taking stock of coping resources.** Schlossberg et al. (1995) discussed the 4 S System developed to describe the four domains that impact how one copes with change. The four variables include situation, self, support, and strategies. First, situation refers to the student's opinion and perspective of the new situation and recognizing where students are in the transition process. Second, in order for students to cope with the transition process, self-awareness needs to be developed prior to implementing social awareness, mental states, or the perspectives of others. Next, individuals experiencing transitions need support, but more importantly, students with ASD who have received an extensive level of support through an established system throughout life need to recognize the wide variety of supports available at the college level. Lastly, strategies are defined as the "coping resources individuals bring to transition" (Barclay, 2017, p. 28). Students with ASD have limited strategies in place initially in addition to decreased executive functions to transfer previous strategies to the new situation. Furthermore, the components of ASD impact the student's participation in seeking out assistance, modifying the situation, controlling and managing the situation, managing the multiple transitions, and

demonstrating the flexibility in choosing various strategies. Focusing on the transitional coping skills could improve the student's success at the university.

Student development occurs through assisting students in transitions. Schlossberg's Transition Theory recommends to "formulate appropriate intervention and support for those experiencing transition" (Barclay, 2017, p. 29). The incorporation of guided study tables in a transitional, comprehensive program allows regular interaction with a support team to adjust to the new situations especially in the classrooms while also focusing on developing self-awareness and coping strategies.

### **Review of Research Literature and Methodology**

With the prevalence of ASD at 1 in 68 individuals (Centers for Disease Control and Prevention, 2016), minimal research has investigated the current outcome data for adults with ASD in terms of employment and postsecondary education (Gotham et al., 2015; Magiati et al., 2014; Taylor & Seltzer, 2011). Shattuck et al. (2012) reported statistics from a National Longitudinal Transition Study 2 which indicated only 34.7% of individuals with ASD attended college and more than 50% of the respondents with ASD had no employment or education two years post-high school. Whereas, research revealed that post-secondary education was the strongest predictor of employment and better earnings (Migliore et al., 2012). Therefore, attendance in higher education needs to be a priority in order to improve the outcome data of adults with ASD.

Even though multiple factors impact the transition and success of students in higher education, regular attendance and active participation were also positive predictors of success for post-secondary education (Chiang, Cheung, Hickson, Xiang, & Tsai, 2012). The complexity and spectrum of the disorder impact the outcome data due to the varying levels of severity, however,

students who have the potential to be successful are failing out or not attending post-secondary education. Early identification, early intervention, and inclusive education now make higher education a viable option for students with ASD (Cox et al., 2017). The population of students on the spectrum diagnosed or undiagnosed enrolled in the college setting will continue to grow. White, Ollendick, and Bray (2011) reported that .7-1.9% of students in college could meet the criteria of ASD. Hart, Grigal, and Weir (2010) noted the connection between life on a college campus and the ability to navigate adult life. Research needs to focus on evaluating effective supports that will positively impact the outcomes for students with ASD.

With increased concerns about higher education and employment rates for adults with ASD, research studies have investigated the needs of college students with ASD (Cai & Richdale, 2016; Cullen, 2015; Gelbar, Shefyck, & Reichow, 2015; Mitchell & Beresford, 2014; Van Hees et al., 2015). Due to concerns with Theory of Mind, self-awareness, perspective taking, and accuracy in reporting, research has also included input from family members (Cai & Richdale, 2016; Dymond, Meadan, & Pickens, 2017), faculty (Dymond et al., 2017; Gobbo & Shmulsky, 2014), and university staff (Knott & Taylor, 2013). Needs assessments from all stakeholders and systematic reviews of the literature (Adreon & Durocher, 2007; Gelbar, Smith, & Reichow, 2014; Highlen, 2017; Toor, Hanley, & Hebron, 2016; VanBergeijk, Klin, & Volkmar, 2008) indicated the need for additional supports within higher education. The research outlined supports could be beneficial to help with core characteristics (communication and social skills), co-morbid conditions, perspective taking, and executive functioning skills which can all impact the college student with ASD. The needs have been clearly documented, but now the supports and programs designed to assist the students with ASD need to be researched to

determine the impact on outcomes and provide evidence for best practices or intervention for college students with ASD.

Innovative supports and programs have been established to attempt to improve outcome data for students with ASD, however, research evaluating the programs or supports are limited. Best practices have been identified for intervention for ASD especially for early childhood education and school aged children. The implementation and research on these strategies in the post-secondary education and employment settings need additional research (Dingfelder & Mandell, 2011). The additional research will help guide future programs to hopefully improve the outcome data for adults with ASD.

Nationally, the enrollment rate for youth with ASD to attend a 2-year or 4-year college was 34.7% and more than 50% of youth had left college with no participation in employment or education (Shattuck et al., 2012). The limited amount of research addressing the programs usually only highlight one specific service. For example, a cognitive-behavioral intervention support provided evidence to address problem-solving skills through direct training, but the study measured feasibility and efficiency of the program with no relationship to outcomes of the success of the students (Pugliese & White, 2014). Peer-mediated treatment was supported through mentor and mentee research which provided quantitative data from the perspectives of the individuals involved through surveys and focus groups (Ames et al., 2016; Gillespie-Lynch et al., 2017; Roberts & Birmingham, 2017). Both interventions can be beneficial in the college and work setting, however the impact on outcome data and the transition to independence in the college setting were not studied.

If students with ASD need additional support, then research needs to evaluate the current and best practices of institutions to support the students throughout college. Barnhill (2016) and

Brown and Coomes (2016) investigated the supports being offered for students with ASD. Barnhill (2016) surveyed faculty and support staff at 30 colleges including public, private, 2-year, and 4-year institutions that offered specific programs for students with ASD. Most institutions in the study reported having greater than 39 students identified with ASD on campus. Through open-ended questions and surveys, institutions varied in terms of supports that were helpful and not helpful. Study tables were found to be effective by the faculty and staff from the institutions. The study also revealed, "A comprehensive, flexible approach that is individualized based on the student's unique needs appears to be integral to a successful program" (p. 12). However, the study noted the need for additional data to verify the effective services and the need to connect the data to the graduation or retention of the students.

Similarly, Brown and Coomes (2016) and Roux et al. (2015) specifically explored the support services at public 2-year institutions. A strong theme indicated students with ASD are "unique individuals benefitting from personalized accommodations or services" (Barnhill, 2016, p. 472). The need for routines and consistency was noted throughout the study. The limited research on specific services and the connection to the student's success restricts the institution's ability to offer evidence-based practice and maximize services to benefit the students. Services are necessary; institutions are willing to offer supports and programs, but best practices and the impact on overall outcome data continues to be lacking.

Comprehensive supports offered at specific institutions revealed descriptive data for institutions to utilize when creating or designing supports (Hansen, 2011; Retherford & Schreiber, 2015; Weiss & Rohland, 2015). Hansen (2011) noted that even though colleges offer tutoring services, students with ASD may not take the initiative to attend or have the skills necessary to organize assignments to seek assistance from the tutor. The difficulties associated

with executive functioning skills for students with ASD on campus negatively impact the ability to access and utilize specific supports. Therefore, scheduled guided study tables provide the routine, structure, and consistency which appeal to the restrictive, repetitive behaviors of students with ASD while also providing the necessary support with executive functioning skills to complete and submit assignments which should impact grades and retention.

Retherford and Schreiber (2015) reported on a one-week college preparation program. The study outlined the numerous components of the program and the instructional elements incorporated. For example, executive function skills were incorporated during planning outings, the creation of a portfolio, managing time and schedule, prioritizing problems, and study skill instruction. Additionally, Weiss and Rohland (2015) discussed a communication coaching program which discussed the need for students with ASD to understand the “hidden curriculum” involving the design, priorities, and assignments of each course which is usually listed in the course syllabi and implementing the productive use of time not in the classroom. The hidden curriculum is further complicated with the hidden disability of ASD involving the need to support the higher cognitive processes. Couzens et al., (2015) determined informal networks to be an effective support which students with ASD need to establish in the transition to the college setting.

Executive function skills seems to be an integral part of the academic success and foundational skills necessary for college student development, however, research has focused more on pragmatic skills, support groups, peer mentoring, and social communication supports for students with ASD in post-secondary education (Ames et al., 2016; Ashbaugh et al., 2017; Gillespie-Lynch et al., 2017; Hamilton, Stevens, & Girdler, 2016; Ness, 2013; Roberts & Birmingham, 2017; Zager & Alpern, 2010). Mentoring has been proven to be a positive support

within higher education for students with ASD to assist with social and pragmatic skills (Hamilton et al., 2016; Weiss & Rohland, 2015), but the impact on outcomes and data continues to be limited in the research studies.

Furthermore, additional research has studied decision making competency and improving problem-solving skills for students with ASD (Levin et al., 2015; Pugliese & White, 2014). Levin et al. (2015) connected the difficulties with decision making to theory of mind and the impact on social skills. However, decision-making skills also impact the executive functioning skills and need to prioritize, organize, plan, and complete college-level work. The overall conclusion from the studies continues to emphasize the need for additional research on specific supports to determine best practices to improve the outcomes of students with ASD.

In the transition to college, social skills are important, but the need to develop the necessary executive functions skills for academic success and retention need to be investigated which could then assist with anxiety, depression, and other co-morbid conditions which could impact the student's willingness to focus on social skills. Wenzel and Rowley (2010) reported on the development of a first-year seminar course specifically designed for students with ASD to teach academic strategies and social skills. The curriculum was designed and taught by faculty in the Communication Sciences and Disorders department who have understanding and background with the ASD population. The design demonstrated innovative thinking which is necessary for addressing supporting the needs of the students. Due to the complexity of the diagnosis, research needs to focus on collecting data and possibly developing a hierarchy of services to ensure students with ASD are receiving sustainable, evidence-based intervention that will positively impact the outcome data of students with ASD.

Hewitt (2011) and Trevisan and Birmingham (2016) initiated research on specific components of ASD that will impact the success of students in higher education. Trevisan and Birmingham (2016) studied the relationship between autistic traits and college adjustments by collecting data from neurotypical undergraduate students not diagnosed with ASD. The students with greater tendencies of ASD were compared to the other undergraduate students using a student adjustment questionnaire. Even the students who were not diagnosed with ASD but had more autism characteristics struggled more with adjusting to the academic, social, and personal-emotional adjustments of college. Pragmatic language difficulties identified in the studied impacted the adjustment to college even for students not diagnosed with autism. All students including students with ASD need support with social communication. However, the students with ASD may experience additional difficulties due to the impact of executive dysfunctions or other characteristics. The unique challenges involved with ASD mean that students need additional supports beyond the peer mentors or social groups previously discussed to impact academic success. Hewitt (2011) supported the idea that social challenges will impact the integration into college but other factors related to higher order thinking and executive functions are critical to academic success. Therefore, the adjustment and adaptation to the college setting need to take priority when developing the necessary skills in the transition to the new environment.

Innovative programs and supports are a newer phenomenon within higher education for students with ASD; the research is lacking in terms of prioritizing supports, identifying the resources necessary within the institution, and determining the transitional supports necessary within the first semester or year compared to subsequent supports involving self-determination, college and career readiness, and self-advocacy supports. Comprehensive supports are

necessary, but isolating specific supports in the research will assist families, universities, and students in future planning. The changes in classification including PDD-NOS, autism, high functioning autism, and Asperger's Syndrome will continue to complicate future research. Regardless, the need to study intervention techniques and strategies for students with ASD is vital to the success and change in future outcomes.

College presents new demands on students compared to the high school experience, and students must be able to manage the competing demands (White et al., 2016). Students with ASD who experience executive dysfunctions need assistance in the transition to college knowing the new situation, self, support, and strategies. Transition involves new roles, routines, and relationships which need to be developed and supported (Barclay, 2017). The research on the number of study hours impacting academic performance varies (Lammers, Onwuegbuzie, & Slate, 2001; Nonis, Relyea, & Hudson, 2007; Plant, Ericsson, Hill, & Asberg, 2005). However, study skills including time management and quality of study impacted academic performance which students with ASD need to establish in the transition to college.

Interestingly, Mokhtari, Delello, and Reichard (2015) studied 935 undergraduate college students and discovered about half of the students admitted that multitasking interfered with core activities such as study habits. The multiple distractions available to college students can especially impact students with ASD in the transition to post-secondary education who struggle with executive functions such as prioritizing, self-awareness, and self-monitoring. The guided study tables assist with decreasing or eliminating the distractions through the designated setting, time, oversight of a peer/support system, and selected work to complete.

Executive functioning skills impact academic success. In the qualitative study completed by Anderson and Butt (2017), families and students reported difficulty with the ““executive

functioning stuff” (p. 3036) which negatively impacted performance and resulted in students failing. The executive functioning skills are the foundational, cognitive processes necessary to later develop empowerment, self-advocacy, self-determination, and career preparation. Getzel and Thoma (2008) identified self-determination to be important to the academic success of students with ASD in college. Direct intervention for self-determination is to first establish the executive functioning skills to organize, set limits, and prioritize for problem-solving; the self-awareness of one's own strengths and weaknesses to assist with goal setting; and the planning, controlling impulses, and flexibility to seek out services on campus and form relationships.

The review of the literature revealed additional research is imperative to determine the best strategies and techniques to support students with ASD in higher education. Admission to the institutions is not a concern due to strong academic potential as demonstrated in high school and standardized testing, however, the transition can be difficult due to the complexity of the disability. Comprehensive, individualized services have been determined to be effective, however empirical data is lacking in terms of programs and isolated services. The current research is designed to contribute to the transitional needs of students with ASD especially in connection with the development of executive functioning skills necessary for academic success.

### **Review of Methodological Issues**

Since the increase of prevalence in ASD and the improvements in intervention, researchers needed to investigate the challenges and needs of students with ASD in higher education. The various methods available in research presents the need to investigate topics from a variety of different strategies. With any topic, the methods chosen will contain issues or concerns.

An extensive amount of research is available regarding the perspectives, opinions, and themes of various stakeholders (i.e. students with ASD, parents, family members, faculty, and staff) in terms of students with ASD in higher education. Qualitative research utilizing interviews and focus groups revealed multiple struggles exist for students with ASD (Cai & Richdale, 2016; Cullen, 2015; Mitchell & Beresford, 2014; Van Hees et al., 2015). The needs assessments indicated that all stakeholders agree that supports and programs need to be established to address the complexity of the ASD diagnosis in post-secondary education. More importantly though is what are universities doing to promote the success of the students with ASD.

In order to expand on the qualitative data, mixed methods research incorporated surveys in the collection of information, however, the emphasis on needs and challenges continued to be the focus. An online survey and focus groups assisted in gathering information from students and families with ASD who previously attended college, never attended, or still hope to attend which provided additional perspectives however the results continue to be similar (White et al., 2016). Students with ASD need support due to the challenges associated with ASD in the areas of core ASD, co-morbid conditions, theory of mind, and executive functions. The number of participants from the additional research assisted in confirming the struggles and organizing the most common themes or concerns.

As programs and supports have been developed, additional qualitative, mixed methods or descriptive research promoted the success of the assistance provided for students with ASD. Exploratory studies surveyed colleges and disability services to determine the specific accommodations available for students with ASD (Barnhill, 2016; Brown & Coomes, 2016). Case studies and pilot studies initiate the need to evaluate specific students with ASD or certain

components of ASD that impact performance in higher education (Ashbaugh et al., 2017; Hamilton et al., 2016; Ness, 2013). Descriptive research demonstrated the innovative and creative techniques being implemented to assist students with ASD, but the evaluation of the programs involved satisfaction or reflection results from biased participants (Ames et al., 2016; Hansen, 2011; Retherford & Schreiber, 2015; Weiss & Rohland, 2015; Wenzel & Rowley, 2010). Additional research is necessary to further determine evidence-based practice that is effective for students with ASD in higher education evident through quantitative measures.

Quantitative research is limited especially in connection with measuring college success or outcome data. For example, problem-solving skills and intervention measured through pre- and post-data measured the feasibility and satisfaction of the students involved with the suggestion that problem-solving skills "may improve quality of life, as well as success and satisfaction in college" (Pugliese & White, 2014, p. 719). After a review of the literature, Zeedyk, Tipton, and Blacher (2016) concluded very little empirical data has been collected to design programs to help students with ASD be successful at the university level. However, multiple programs and supports continue to be created based on limited evidence and research. The alarming outcome data for students with ASD proves that research needs to focus on practices that directly support the development of skills that will positively impact grades, retention, graduation, and employment.

Informally, Shmulsky, Gobbo, and Donahue (2013) reported descriptive data on the grade point averages and retention data for the thirty students in the Transition Program at Landmark College. The cumulative first-year GPA for participants in the Transition program was 2.74. Thirteen of the students achieved a GPA of 3.0 or higher; ten earned a GPA between 2.0 and 2.99, and four earned a GPA below a 2.0 (p. 238). The retention rate data indicated that

90% of the students completed the first year and eligible to re-enroll, while 84% completed the first year. Multiple factors impact the success of students, but academic success allows for retention, the development of other skills, progress towards graduation, and potential for employment.

In addition to the need for quantitative data promoting positive outcome data, the research is lacking in terms of longitudinal studies. Rather than report on a study over the course of one semester, data over multiple semesters or years would assist in determining if the support or program was effective. The limited number of studies, participants in the studies, and the length of time for implementation of supports all impact the generalization of supports across settings. The goal of the current study was to isolate one, unique component of a transitional program while utilizing quantitative methods over the course of multiple semesters to determine if a correlation exists in terms of the support service and impact on academic success for students with ASD.

### **Synthesis of Research Findings**

Based on the review of the literature, the specific components of comprehensive programs for the transitional year of supports to substantiate success in higher education with grades and retention does not exist. Comprehensive programs offer a variety of supports including academic achievement, social supports, and daily living to accommodate the core characteristics, co-morbid conditions, theory of mind, and executive function skills. However, research to support the development or continuation of the innovative programs is limited.

Pragmatic deficits associated with the core characteristics of ASD and theory of mind have been explored in research through the implementation of support groups or peer mentorship (Ames et al., 2016; Roberts, 2010). The investigation of transitional services from high school

(Hatfield et al., 2016; Wehman et al., 2014) revealed supporting the co-morbid conditions, especially anxiety, associated with the unknown of the college experience. However, the deficits associated with executive functions which impact the student's organization, planning, flexibility, setting objectives and goals, controlling impulses, initiation, completion, and overall academic success have not been specifically investigated. Multiple studies have recognized the impact executive functioning skills have on students with ASD to understand the hidden curriculum and achieve the necessary level of independence in post-secondary education (Anderson & Butt, 2017; Retherford & Schreiber, 2015; Van Hees et al., 2015; Weiss & Rohland, 2015).

Executive functioning skills are critical for post-secondary academic success. The current studies with students with ASD seem to be focusing on self-determination, self-advocacy, and empowerment (Getzel & Thoma, 2008), however, students with ASD need to develop the executive function skills in the transition to the university setting (i.e. develop routines, understand the expectations, organize materials, and manage time) to later increase independency and the higher level skills. Guided study tables allows regular support in a naturalistic environment with peer support to help the student with ASD enrolled in the comprehensive program to transition to the new setting. The student learns to orientate to the setting; learn the new situations of each course, syllabi, and expectations; learn the strengths and weaknesses of self; develop a support system; and work on establishing strategies for success. The 4 S's (situation, self, support, strategies) associated with Schlossberg's transition theory are supported through regular contact in guided study tables and targeting the executive functioning skills necessary for academic success and independence for students with ASD.

## **Critique of Previous Research**

Stakeholders agree that students with ASD in higher education need additional supports to improve the retention and academic success to work to improve the employment and education outcomes of students with ASD. Previous research has focused on surveys, focus groups, opinions, and feasibility rather than concrete data and statistical analysis. If additional supports are necessary, then research needs to evaluate the focused intervention to determine evidence-based practices that are effective for students with ASD in higher education.

Multiple supports are being created and available at the college level including support groups, peer mentors, and social training which can be helpful to students with ASD, but research is lacking in regard to the influence on academic success, graduation rates, and employment. As comprehensive supports are being offered, empirical evidence is necessary to evaluate the impact on success.

Executive function skills directly correlate with the skills necessary for achievement in post-secondary education and employment, however no research has investigated supports directly targeting executive function skills. Therefore, the current study will contribute to the limited research on students with ASD in higher education while adding quantitative data which is lacking. Specifically, the study will investigate the executive function deficits associated with the diagnosis of ASD, and direct supports designed specifically for the development of executive function skills in the transition to post-secondary education.

## **Summary**

ASD is a complex disorder involving core social communication deficits, co-morbid conditions, difficulties with theory of mind, and executive function deficits. The outcome data for students with ASD entering post-secondary education or employment is one of the lowest

compared to all other disabilities (Grigal et al., 2011; Migliore et al., 2012). Students with ASD entering college are faced with numerous challenges, and research has indicated the need for additional supports due to the complexity of the disorder. Even though supports are being implemented, quantitative research is lacking in regard to the correlation of receiving the supports and academic success.

In addition, executive functions have been identified by stakeholders as an area of weakness needing addressed in the transition to college, however research studies have not specifically included the investigation of an isolated support specifically designed to assist with the development of executive function skills. Therefore, the conceptual framework of the current research study will specifically focus on the executive function skills of students with ASD. Executive functions are cognitive and metacognitive processes controlled by the prefrontal cortex of the frontal lobe of the brain. In the transition to college, students with ASD experience executive function deficits which limit “successful engagement in complex, novel and goal-oriented behaviors” (Jones et al., 2017, p. 2). Establishing the necessary patterns for success in the transition can make or break the college experience. Students with ASD need assistance in establishing routines, prioritizing new demands, initiating strategies and supports, and monitoring success and failures. The regular attendance of guided study tables allows for on-going teaching, modeling, and observing of executive functions in the transition to college.

Based on the review of literature, which develops a unique conceptual framework using executive function skills to understand what can assist students with ASD in the transition to higher education, there is sufficient reason for thinking that an investigation examining the impact of guided study tables on academic success may yield significant findings for parents, administrators, students with ASD, and staff. In the transition to post-secondary education,

guided study tables as a component of a transitional program for students with ASD can help develop the executive function skills necessary for academic success. I can, therefore, claim that the literature review provides strong support for pursuing a research project examining a possible correlation guided study tables have on academic success for students with ASD and the relationship between the end of semester grade point average and student's program evaluation report of executive functioning skills.

## **Chapter 3: Methodology**

### **Introduction to Methodology**

Kuder and Accardo (2018) suggested supports and programs designed to help students with autism spectrum disorder (ASD) in higher education need to be evaluated using quantitative data. The transition to post-secondary education presents new challenges for students with ASD. Schlossberg's transition theory identified the need to manage the transition through the 4 S's, self, situation, support, and strategies (Barclay, 2017; Schlossberg et al., 1995). One university in the mid-west incorporates a minimum of six hours of guided study tables into the transitional program for students with ASD to aid in the development of academic and executive functioning skills necessary for college success. Executive functioning skills are the mental processes necessary to initiate, shift, organize, attend, and manage multiple tasks which are especially necessary for independent, academic success at the college level (Fehy & Richard, 2016; Grieve, Webne-Behrman, Couillou, & Sieben-Schneider, 2014). The study examined the relationship of guided study tables to the academic success and student independence especially in the area of executing functioning skills at the one institution of students with ASD enrolled in a comprehensive, transitional program.

The quantitative research design incorporated both a correlational research design and descriptive survey which provided additional data in terms of programs and supports designed specific for students with ASD in higher education. Kuder and Accardo (2018) revealed the need for additional studies focused on data and outcomes for college students with ASD. In this chapter, the methodology of the current study will be reviewed including the purpose of the study, research questions, hypotheses, research design, target population, sampling method and related procedures, data collection, operationalization of variables, data analysis procedures,

limitations and delimitations of the research design, internal and external validity, expected findings, and ethical issues in the study.

### **Purpose of the Study**

Studying comprehensive programs designed to support students with ASD in higher education provides the opportunity for families, students, administrators, support staff, and researchers to implement evidence-based practices that are both achievable and appropriate to positively impact the outcome data for adults with ASD. The purpose of the quantitative research study was to examine the relationship between three data points, 1) the average number of hours attended of required guided study tables in a transitional program for students with ASD, 2) the student's academic success measured with the semester grade point average, and 3) data from the program evaluation completed at the end of each semester on the student with ASD specifically related to the executive functioning skills needed for independence at the university. Guided study tables help support the transition to the university, possible development of executive functioning skills, and independence of the students with ASD supporting Schlossberg's transition theory in facilitating the necessary skills for success in post-secondary education.

### **Research Questions**

The following research questions were examined in this study:

RQ1: What is the relationship between guided study tables and the academic success (G.P.A.) of students with ASD in a transitional, comprehensive program?

RQ2: What is the relationship between participation in the guided study tables and development of executive function skills needed for independence on the college campus?

## **Hypotheses**

The researcher's assertion was that students with ASD who attended and participated in guided study tables would demonstrate a relationship between academic success and independence of executive functioning skills necessary on the college campus. Previous research indicated that the number of hours studying did not predict grade point average (Plant et al., 2005). Therefore, the null hypothesis for this study was that there is no relationship between the number of hours of guided study tables and the academic success of students with ASD or the independence of executive skills necessary for the college setting.

**Null hypothesis.** The following null hypotheses were established:

NH1: There is no relationship between the number of hours of guided study tables and the academic success of the students.

NH2: There is no relationship between the number of hours of guided study tables and the level of independence related to executive functioning skills in the college setting.

**Alternative hypothesis.** The alternative hypothesis were as follows:

AH1: There is a relationship between the number of hours students record in guided study tables and the academic success of the student with ASD.

AH2: There is a relationship between the number of hours of guided study tables and the independence level of executive function skills for college students with ASD.

## **Research Design**

The quantitative research methodology utilized both a correlational design and a descriptive survey to investigate the relationship between participation in one component of the comprehensive program (guided study tables) and the academic success (grade point average) of

the student with autism and/or the development of executive function skills in the college setting. Quantitative research methods focus on objective measurements while incorporating collecting numerical data and statistical analysis (Creswell, 2014). Previous research has been lacking in objective measurable, numerical data related to supports at the college level for students with ASD. Correlational design was used to determine if the variables changed proportionately (Adams & Lawrence, 2015). The strength of a linear relationship can be determined using the Pearson product moment correlation coefficient ( $r$ ). A correlational study must include the raw data, correlational coefficient ( $r$ ), sample size ( $n$ ), and probability of common error ( $p$ ). The variables in the study included the average number of weekly guided study table hours recorded by the student, the semester grade point average of the student, and the scores from the program evaluation related to executive function skills.

Casual-comparative research design was not appropriate for the current study. The study did not contain an experimental design nor was the researcher able to realistically complete the designed study. In addition, the study lacked an experimental design which prohibited the use of experimental research. Ideally, the students in the program would be compared to other students at the university with ASD selecting not to participate in the program, however at this time, the researcher was not ready for that level of comparison. The review of research indicated the need to study the types of supports offered to students with ASD and especially start making correlations to the impact the supports have on academic success and assistance with the transition to higher education. The outcome data for students with autism as an adult is bleak which supports the need to study the supports implemented to directly impact the student's success while also focusing on deficit areas connected to ASD.

In addition, a descriptive survey was incorporated to provide demographic information about the students with ASD attending higher education and seeking support programs in the transition to the university setting. Students currently or previously enrolled in the program were contacted to voluntarily participate in a short survey with minimal risk to participate. The information was collected and analyzed to assist in the exploration of current data and comparison of other studies. The additional information provided specific information regarding students with ASD in higher education. Siew, Mazzucchelli, Rooney, and Girdler (2017) provided descriptive data including age, gender, year of study, and major of study. The descriptive survey investigated similar demographic information to assist with additional analysis of the students seeking supports for ASD in post-secondary education. Participation was voluntary, and the students clicked consent to indicate understanding of the procedures. The convenience sample included all students past and present, still attending the university who have participated in the program and agreed to participate in the survey.

### **Target Population, Sampling Method, and Related Procedures**

The target population of the study was students enrolled in a program specifically designed for students with autism at the university level. The students were accepted to the university on their own merit through the university's admission process. Once accepted to the university, the student then self-disclosed the disability to the Office of Student Disability Services with the appropriate documentation to meet the requirements for autism spectrum disorder through the Americans with Disabilities Act (ADA). Lastly, the student then completed the required release of information and agreement forms for the comprehensive, transitional program. The university program for students with ASD was limited in number to a maximum

of fifteen students each semester. Therefore, the sample size was limited due to the limited enrollment of the program.

The setting of this study was a mid-western, state university located in a rural area with approximately 7,500 students. The residential, comprehensive university developed a program for students with autism in 2015 to help families and students with the transition from high school to post-secondary education. The program was piloted in 2015 with six students, and during this study, the maximum enrollment per semester was 15 students.

The students with autism currently enrolled or previously enrolled in the program were contacted via e-mail to voluntarily participate in the descriptive data survey. Approval was gained through the institution's IRB to collect data from the program anonymously. The director was contacted to ask for the necessary data for analysis. An identifying number or code was assigned to each participant to ensure confidentiality.

### **Instrumentation**

The students currently or previously in the program and still enrolled at the university were contacted via e-mail (see Appendix C) with to request voluntary participation of the anonymous survey in order to collect additional information regarding the demographic information of the students. The Institution Review Board (IRB) for Concordia University-Portland and the university with the comprehensive program reviewed the study and permission was received to conduct the survey with the students.

A survey was created (see Appendix A) by the researcher to gather descriptive data on the students currently enrolled or previously enrolled in the comprehensive program for students with autism. The questions on the survey were based on the descriptive data presented in other studies involving college students with autism (Anderson & Butt, 2017; Gelbar et al., 2015;

Pugliese & White, 2014; Roux et al., 2015; Trevisan & Birmingham, 2016). The surveys were distributed to students by using Qualtrics online survey research site.

## **Data Collection**

Quantitative studies involving college students with autism are limited (Kuder & Accardo, 2018). Numerous institutions have started providing supports or programs to provide students with ASD additional assistance during their college experiences, however the analysis of specific supports or programs for students with ASD need to be researched. Therefore, the current study was designed to analyze data through a correlational design from students participating in a comprehensive, transitional autism program at one university. Previous studies such as Pugliese and White (2014) utilized pre- and post-tests when determining the efficacy of a problem solving course for five students with autism. One specific support was analyzed, however the results reflected the usefulness of the program rather than objective data related to the impact on outcomes or success of the students. Retherford and Schreiber (2015) evaluated a comprehensive summer program for students with autism preparing for college, however the research involved surveys from biased participants and parents with a great amount of descriptive information about the specific supports with minimal data or evidence regarding the outcomes or success of the students in the summer program.

The current study focused on collecting numerical, objective data from a comprehensive program and relate the numbers to the academic success of the students. Three data points from the program were collected anonymously. The director of the program provided the researcher with the compiled data necessary for the study on an Excel document with no identifying information of the students. The data obtained for each student consisted of the average number of hours per week in guided study tables, the semester grade point average, and three data points

from the program evaluation relating to executive functioning skills. The data specifically requested and chosen for the study kept the study objective while focusing on the conceptual framework, executive functioning skills of students with ASD in higher education.

The three data points include the collection of the average number of hours per week in attendance at the guided study tables, the semester grade point average of the student, and the program evaluation scores related to executive functioning skills for the same semester. The student's GPA were used to determine if there is a relationship in the participation of the required support of the comprehensive program and the academic success of the student. Additionally, the average number of hours per week of guided study tables and the program evaluation scores related to executive functions were analyzed to determine if there was a relationship between participation in the guided study tables and the development of executive functioning skills necessary to reach the level of independence in the transition to the college level.

Grade point averages (GPA) for each semester are computed by multiplying the number of semester hour credits by the numerical values assigned to the final letter grade earned in each course. The university assigned the letter grade A as a 4.0 value, B is a 3.0 value, C is a 2.0 value, D is a 1.0 value, and F is a 0.0 value. Students have to maintain above a 2.0 grade point average to be in academic good standing. Students who fall below a 2.00 GPA are placed on academic warning. Depending on the concurrent semesters and student's GPA, students could be at risk for academic probation or academic dismissal. GPA are used at universities to measure academic success, honors programs, retention, and graduation requirements.

In order to further understand the students and families seeking comprehensive supports for students with autism in higher education, a descriptive survey was distributed to students

currently enrolled or previously enrolled in the program with a university e-mail address. Please see appendix A to review the survey. The information gathered was reviewed and summarized to better understand the population of students with autism spectrum disorder seeking out supports in post-secondary education.

The quantitative correlational and descriptive research design will use data collected from the program while also surveying the students with ASD currently or previously enrolled in the program. The researcher completed the following steps during the collection of the data:

Step 1: Obtained permission from the institution's IRB to collect anonymous data from the director of the program on an Excel document with no student identifying information.

Step 2: Contacted the students with ASD currently or previously enrolled in the program via e-mail with the research study information and active link to the Qualtrics survey.

The students read the overview of the study and provided anonymous consent to be a part of the study. After completing the 18-question survey, the student submitted the responses.

### **Operationalization of Variables**

The executive functioning skills of students with ASD in higher education were studied to determine if there is a relationship between the average number of hours a student participates in guided study tables, the academic success of the student, and the evaluation of the student's executive function skills on the college campus. The variables were selected to analyze numerically specific aspects of comprehensive transitional programs. Graduation rates and employment rates were not able to be assessed due to the newness of the program, so academic success was measured through grade point average.

Guided study tables was a required component of the fee-based program which is clearly defined and agreed upon by the participants in the transitional program. The students were required to complete six hours of guided study tables each week. The student was instructed to sign-in, record the objective or task being targeted at the study table, and sign-out prior to leaving. The program supported 14 hours of guided study tables each week, and students were provided a visual schedule which incorporated the available guided study table times that were conducive to their schedule. All students were required to attend Sunday evening guided study tables, and then ideally two additional days, four additional hours, throughout the week. Two mentors were assigned to the all scheduled guided study tables. Students did have the option to attend tutoring sessions or work in a department laboratory (i.e. art or music) to fulfill the guided study table hours. Students in the program are responsible for recording the substituted hours on the study table sign-in form. Even though attending six hours of guided study tables was a requirement of the program, students fail to meet the number of hours expected while other students attend additional hours. The program sponsors up to 14 hours of guided study tables a week, and the student were able to choose the hours that work best in their schedule or daily routine.

The semester grade point average was used as the data point for measuring academic success. The university uses a 4.0 grading scale, and the semester consists of 16-week courses. Students in the program were enrolled as full-time students with a minimum of 12 semester hours. The grade point average was collected strictly anonymous to ensure total separation of students and data collected.

At the end of each semester, the four staff/administrators of the program complete a student evaluation. The internally developed student evaluation focuses on the student's level of

independence on the college campus in the areas of academics, social skills, and daily living. Three specific questions pertain to the executive functioning skills of the students including flexibility, time management, and self-awareness. The average of these three scores on the five-point Likert scale used for the student evaluation were used individual and averaged together to determine the relationship between guided study tables and executive functioning skills.

### **Data Analysis Procedures**

The correlational research design incorporated data from a comprehensive, transitional program for students with autism in post-secondary education. Data from the students, university, and the program were incorporated to diversify the analysis of results. Previous studies have depended on surveys and opinions of efficacy to determine success (Gillespie-Lynch et al., 2017; Siew et al., 2017). Consequently, the objectiveness of the studies is questioned due to bias and direct involvement of the participants. The data in the current study being analyzed combined information from various stakeholders. Students documented participation in guided study tables throughout the 16-week semesters which were reviewed and calculated for an average number of hours per week. The semester grade point averages assigned by various instructors of the courses for each student provided a concrete, objective measurement of academic success. Finally, the program evaluation scores completed by the four staff/faculty of the program provided a Likert-score average of the level of independence with executive function skills at the end of each semester that was then provided to parents and students with recommendations for the next semester.

For collection of the data for the study, the researcher requested the necessary information from the director of the program. The director had a graduate assistant compile the requested variables and provide the researcher with an Excel file with the following information:

the average number of hours in attendance for guided study tables, the grade point average of the student, and the scores of the program evaluation results of the three questions related to executive function skills. The document did not contain any student identifying information and was securely saved on a password protected computer.

For analysis, the researcher used Statistical Package for the Social Sciences (SPSS) software. The purpose of the study was to determine whether a relationship existed between participation in guided study tables and academic success. In addition, correlations were evaluated between guided study tables and development of executive functioning skills necessary for independence at the new college environment. The data analysis for the study used Pearson product-moment correlation coefficient ( $r$ ) (Adams & Lawrence, 2015).

In order to answer the first research question, a Pearson's correlational analysis was selected to determine the relationship between the number of guided study tables and the grade point average of the student for the same semester. The second research question was analyzed also using a Pearson correlational analysis to state the relationship between the number of hours in guided study tables and the level of independence related to the development of executive function skills for the students with ASD in the college setting.

After surveying the students currently or previously involved in the transitional autism program, the results from the descriptive data survey were compiled from Qualtrics for analysis. The researcher analyzed the information for patterns, trends, and information about the participants in a comprehensive program for students with autism. The information collected was compared to previous studies and data involving college students with ASD.

## **Limitations and Delimitations of the Research Design**

The correlational research design was chosen to determine relationships between specific aspects of the transitional program and academic success or evaluation of executive function skills, but limitations and delimitations existed. The size of the population was limited due to the maximum number of students allowed in the program, institutions staffing to service the students, and number of students with autism that access higher education while also meeting the criteria for admissions to the university. Programs are very unique in terms of services offered, and so the study was specific to one institution at this time. However, the design of this study could be replicated by other schools with similar programs. In addition, the study was not able to implement random or control groups due to the size and limited population.

Another limitation of the study was the accuracy and honesty of the students with autism in the program documenting the guided study table hours. Students are required to attend a minimum of six hours of guided study tables a week. Two mentors are present, but the students with ASD are responsible for signing in and out, recording hours, and declaring objectives of the session. The logs were reviewed on a weekly basis during regular, weekly meetings between the director and staff. The accuracy of the information recorded was dependent on the students in the program recording and reporting the time correctly. The researcher was aware that due to the limitations of the study the results may not be accurately generalized across different settings or students.

Several delimitations existed in the current study. The variables chosen for the study consisted of the grade point average and the data regarding executive functioning skills from the program evaluation report. Grade point average was chosen due to the need to improve the outcome data of students with autism in post-secondary education and employment. The

transitional program had only been in existence since 2015, and so employment data was not accessible yet. Therefore, academic success was chosen which is regularly measured through grade point averages. The implementation of grade point average was designed to increase validity of the study.

Executive functioning skills can be measured in a variety of ways, however the program truly focused on the transition to the university and supporting the students towards the level of independence necessary on the college campus. The implementation of the program evaluation questions related to the executive function skills supported the conceptual framework of the study. The program evaluation was created internally, used only at one university, and does not have confirmed reliability or validity. The evaluation for each student was completed by the administrators and staff of the program at the end of each semester, and the ratings were based on the student's performance throughout the semester. Biases could exist; however the evaluation was provided to the students and families with a recommendation for the next semester. Enrollment in the program was only for a semester which means families had an option to continue or discontinue in the program. The program evaluation and recommendations allowed families additional information to assist in their voluntary choice. In addition, the design of the transitional program was for students to "graduate" or be dismissed from the program. Therefore, the incorporation of the results from the three questions from the program evaluation provided an objective view of executive function skills at the university setting from administrators/staff familiar with the university environment and college students.

Besides instrumentation, sampling also provided delimitations. The students in the program were admitted to the university on their own merit, documented the disability of autism, and enrolled in the transitional program. The intake process for admissions to the program was

not standardized or based on a numerical system at this time. An interview was not required but highly recommended. The program did not require formal assessment or pre-testing of current skills. Other factors could have impacted academic performance and executive function skills that were not accounted for upon enrollment into the university or program. Additionally, guided study tables encompassed six hours of the transitional program; the students in the program participated in three to four additional hours of support in the areas of academics, social, and daily living which could have impacted academic success or the development of executive functioning skills.

### **Internal and External Validity**

Internal and external validity were accounted for through the design of the research study. The purpose of the study was to determine if a relationship exists between the participation of guided study tables and the academic success for the students with autism in the transitional education program. In order to reduce threats to internal validity, the semester grade point average was selected as the variable analyzed. Grades can be impacted by instructor biases, beliefs, or attitudes, but the average of the grades from all the courses throughout the semester assisted in improving validity.

Additionally, the study investigated the correlation between average number of hours participating in guided study tables and the program evaluation of executive function skills. Utilizing the program evaluation allowed the research to collect numerical data for analysis related to the transitional program, however the data was subject to measurement errors which can be a threat to the internal validity of the study. The evaluation was a non-standardized instrument completed by four administrators/staff of the program at the end of the semester. Extraneous variables also existed. The guided study tables were only one component of the

comprehensive program, and so executive function skills and academic success could be impacted by the other supports offered through the program, level of involvement of parents/families, interaction of graduate assistants or mentors, additional supports accessed throughout campus (i.e. tutoring, writing center, counseling center), or other unknown factors.

External validity was impacted due to the size of the population sample and one location of implementation of the transitional program. The information collected will benefit the university implementing the program and caution should be used when generalizing the findings to other settings. The participants/students were committed to the fee-based program through the signed agreement, and participation was increased due to this commitment of students and families. Regular communication kept the families updated on the progress of the student in the program. Even though the design of the study took into consideration research bias, the external validity was impacted by these factors.

### **Expected Findings**

The researcher expected to find a statistically significant relationship between the average number of hours participating in guided study tables and the student's grade point average. The preliminary data supported the need to develop executive function skills in the transition to higher education for students with autism. In addition, a correlation was expected between the average number of hours in attendance of guided study tables and the development of executive function skills determined on the program evaluation. The study provided a foundation for quantitative data related to student success in post-secondary education for students with ASD. Evidence-based practice and data supported intervention needs to be the focus in order to successfully assist students with autism in higher education.

The information collected can assist in guiding future programs and supports at the university level. Researchers, families, students, educational consultants, administrators, high school faculty, and university staff can benefit from the study to help focus on developing executive function skills in the transition to higher education. Previous research examined the implementation of peer mentors to support social communication and campus participation (Ames et al., 2016; Ashbaugh et al., 2017; Hamilton et al., 2016; Roberts & Birmingham, 2017; Siew et al., 2017). The current research connected the need to establish the necessary skills in the transition to the college setting to be successful. Guided study tables can easily be implemented to develop executive function skills and benefit college students with ASD.

The findings in this study provided additional support to address the employment and educational outcomes for students with autism. Students with ASD need continuous supports and intervention to develop the necessary skills for success in education and employment. Evidenced-based intervention need to be available to students with ASD to maximize success in adulthood.

### **Ethical Issues in the Study**

The ethical issues addressed in the study involved the protection of the participants in the program, the development and distribution of the survey questions, and the potential researcher bias. The Institutional Review Board (IRB) from two universities approved the study while ensuring the safety and security of the participants of the study. Results were analyzed objectively knowing the involvement of the researcher and potential bias.

The confidentiality and autonomy of student information were taken into consideration by having an independent, non-biased university personnel compile the guided study table hours, grade point average, and program evaluation results. All identifying information was removed,

and the researcher secured the Excel documents on password protected computer and a locked file cabinet. The electronic information was deleted from all secured computers at the conclusion of the study and completion of the doctorate program for the researcher.

The nature of the survey questions was designed to provide descriptive data that would be relevant to the current study while assuring the dignity and autonomy of the participants. Participation in the survey was optional. The risk to the participants was minimal. The participants understood their rights as a student and provided informed consent to participate in the study.

Researcher bias was accounted for through the development of the research design. The researcher was employed full-time by the university with one-third of the job responsibilities assigned to the comprehensive, transitional program for students with autism. The numerical data collected allowed the researcher to be objective in the analysis. The students participating in the program recorded the hours in attendance in study tables, the course instructors/professors assigned the grades that contributed to the student's grade point average, and the program evaluation was completed by four administrators/staff of the program.

The researcher is a speech-language pathologist with fifteen years of experience working with students with autism of all ages at the time of the study and four years of direct interaction with college students with ASD. The researcher understood the limited amount of evidence-based practices available for late adolescence and young adults with autism. The researcher had strong interest in developing and implementing evidence-based supports that can benefit students with autism.

## **Summary**

The purpose of this quantitative research design was to examine a specific support of a comprehensive, transitional program for students with autism in higher education. The correlational research design and descriptive survey provide foundational research to assist in determining the effectiveness of the support for students with autism in post-secondary education with specific interest in outcome data related to academic success. In addition, the transitional needs of students and development of executive functioning skills were specifically analyzed to assist in facilitating the skills needed for independence at the post-secondary education level.

## **Chapter 4: Results**

### **Introduction to the Results**

The purpose of the research study was to investigate the relationship between guided study tables and the executive functioning skills of college students with autism spectrum disorder (ASD) in a transitional education program. Guided study tables are one specific support incorporated into a comprehensive program to specifically assist with the transition to the college setting. Specific data of a program at one university was utilized to determine if a correlation exists between participation in guided study tables with academic success and grade point average. In addition, further analysis contributed to determining the relationship of guided study tables impacting the development of executive functioning skills necessary for independence at the university setting. The conceptual framework for the study specifically focused on the related executive functioning skills (i.e. flexibility, self-awareness, time management, and self-advocacy) incorporated into study tables and measured while enrolled in the program.

This chapter presents the results of the study techniques used to analyze the data and answer the research questions. The current section continues to provide additional information regarding the specific components of the program at one university chosen for the study. The Description of the Sample section outlines the results of the descriptive survey providing demographic information of the students with ASD currently or previously enrolled in the fee-based, transitional educational program. The Summary of the Results section provides the information regarding the statistical analysis completed to answer the research questions. The Detailed Analysis section answers the research questions utilizing statistical analysis results. The last section summarizes the analysis and results of Chapter 4.

The following research questions guided the study:

RQ1: What is the relationship between guided study tables and academic success (G.P.A.) of students with ASD in a transitional, comprehensive program?

RQ2: What is the relationship between participation in the guided study tables and development of executive functioning skills needed for independence of the college campus?

Guided study tables are a required component of the transitional, comprehensive program for students with ASD. The students agree to participate in all components of the program through the agreement and enrollment into the program. Guided study tables encompass six of the approximate 10 contact hours in the transitional education program for students with ASD at this one institution. The program supported approximately 14 hours a week of guided study tables within the program. Sunday evening guided study tables are mandatory. The students with ASD in the program receive a paper and electronic visual, color-coded weekly personal schedule at the beginning of each semester with classes, program requirements, and a minimum of six guided study tables structured into the week. The guided study tables have a minimum of two student, volunteer mentors or graduate students present. The volunteer mentors and staff of the program have direct contact with the students with ASD throughout the guided study table time. Mentors participated in an initial one-hour in-service at the beginning of the year and scheduled group weekly meetings. The director of the program provided continuous learning and teaching to the mentors regarding executive functioning skills and strategies to implement during guided study tables to benefit the students with ASD.

The program requires six hours of guided study tables a week which is clearly stated in the agreement to participate in the fee-based program, discussed during the program orientation, and regularly referenced during other program contact activities. Even though required and

scheduled weekly, students vary in the number of hours achieved. The student is required to sign-in and sign-out while also listing main objective for the period of time. The graduate students calculated and recorded the number of hours attended weekly for the students in the program, and the number of hours were reviewed by the director for accuracy. For this study, the average number of guided study table hours per semester were obtained from the director of the program for analysis in the study. A limitation of the study included the honesty and accuracy of the student recording the hours in guided study tables. Mentors are present at the study tables for accountability and support.

The comprehensive, transitional education program was established in 2015. The staff employed with the program consists of a director, faculty support personnel, two graduate assistants, and volunteer mentors based on the number of students in the program. The components of the program specifically target academics, social, and daily living skills. The interactions and support assist in developing the executive functioning skills required for independence on the college campus. Planning, organizing, flexibility, self-monitoring, and prioritizing occur in all aspects of college life. Students with ASD are supported to initiate, complete, and submit assignments to achieve the necessary level of independence needed at the college level. The program works to teach, facilitate, and guide the development of executive functioning skills in the students with autism in the new educational environment.

Academic success in college is frequently measured with grade point average. Since this program was only established in 2015, employment data or income levels are not available yet for comparison which are other ways to measure academic success in future studies. Students must maintain a cumulative grade point average above 2.00 as measured on a 4.00 grade point scale system to remain in academic good standing. Maintaining a 2.00 cumulative grade point

average or higher will eliminate any risk for academic warning, probation, or dismissal.

Therefore, semester grade point average was used in the study to measure academic success of the students in the transitional education program. The study was designed to determine what relationship exists between the number of hours spent in guided study tables and the semester grade point average of students with ASD.

The program admits students on a semester-by-semester basis. The design of the program is to assist students in the transition to the university setting so students can be independent. At the end of each semester, the program faculty and staff complete an internal, informal evaluation of each student. The 11-question evaluation developed internally by the program assesses the key areas of the program including academics, social skills, and daily living on a five-point Likert scale (5=fully dependent/maximum assistance; 4=moderate support; 3=minimal support; 2=monitoring; 1=independent). A score of five indicates the student is fully dependent on the program and needs maximum assistance from the components of the program while a score of one shows the student is displaying independent skills as noted by the program faculty and staff. The results are provided to the student and family along with a written recommendation for the next semester.

The questions specifically chosen for analysis from the non-standardized, informal evaluation created by the university specifically related to the development of executive functioning skills necessary for independence at the university. The questions chosen for this study were as follows:

Question 1: The student demonstrates flexibility and self-awareness.

Question 3: Student is independent in time management skills.

Question 11: Student's overall independence and self-advocacy at the university level.

The three questions chosen related the closest to executive functioning skills. The other questions on the program evaluation related to the other components of the comprehensive program. For example, other questions focused on daily living skills, performance in the classroom setting, management of stress and leisure, and social participation at the institution (see Appendix D).

Another delimitation of the study is incorporating the non-standardized, internally created program evaluation for measuring executive functioning skills. The evaluation was completed by a minimum of four program staff members. The evaluation of performances at the college level did not incorporate all stakeholders such as family members, individual students, faculty, or support service personnel. The research study specifically focused on three questions on the evaluation tool rather than formal measurements.

A quantitative correlational research design was utilized for this study. A goal was to use numerical data from one comprehensive, transitional program to determine what relationship exists between the recorded number of guided study tables and the academic success of the student with ASD. Further analysis will determine the relationship between the average number of guided study tables and the development of executive functioning skills needed for independence on the college campus.

The state university accessed for the current research project was located in a rural community in the Midwest. The director provided four semesters of data to the researcher related to the research questions of the present study. Additionally, the researcher collected demographic information from past and present students in the program through a descriptive survey. The survey questions used for the research were similar to demographic information collected by previous studies involving college students with ASD (Anderson & Butt, 2017;

Gelbar, Shefyck, & Reichow, 2015; Roux et al., 2015; Trevisan & Birmingham, 2016; Wei et al., 2014). The distribution of the surveys are further discussed in the description of the sample section.

### **Description of the Sample**

A descriptive survey was created by the researcher and incorporated to collect demographic information of the past and present students participating in the transitional education program for students with ASD (see Appendix A). The survey consisted of 18 items to gather information regarding the demographic information of students enrolled in a fee-based, comprehensive, transitional education program. The researcher contacted the director of the program, and the survey was distributed via e-mail using Qualtrics. Only students currently enrolled at the university with an e-mail address associated with the institution received the survey to complete. Initial e-mails were sent with a follow-up, reminder e-mail two weeks later (see Appendix C). The researcher does have direct contact with the current students in the program, which assisted in the completion rate of the survey. A total of 13 students completed the survey.

The results of the descriptive survey specific to the demographic information of the students are listed in Table 1. In terms of gender, the survey participants included 11 males (84.6%) and two females (15.4%). The Centers for Disease Control and Prevention (2016) stated the prevalence of ASD is four times more in males than in females. Therefore, males had a disproportional participation rate in this study compared to the national data on ASD. The participants ranged in age from 18-24 years with a mean age of 20 years.

The race/ethnicity of the students completing the survey included 10 Caucasian (76.9%) and three Hispanic/Latino (23.1%). The diversity of students was limited in the current study.

In comparison, Anderson and Butt (2017) studied participants in the mid-Atlantic region with a mean age of 22.9 with race/ethnicity of 78% white, 17% Black/African American, and 6% Asian.

Table 1

*Demographic Information of Sample Students with ASD*

|                       | Count (N) | Percentage |
|-----------------------|-----------|------------|
| <b>Gender</b>         |           |            |
| Male                  | 11        | 84.6%      |
| Female                | 2         | 15.4%      |
| <b>Age</b>            |           |            |
| 18                    | 5         | 38.5%      |
| 19                    | 2         | 15.4%      |
| 20                    | 1         | 7.7%       |
| 21                    | 1         | 7.7%       |
| 22                    | 3         | 23.0%      |
| 24                    | 1         | 7.7%       |
| <b>Race/Ethnicity</b> |           |            |
| Caucasian             | 10        | 76.9%      |
| African American      | 0         | 0%         |
| Asian                 | 0         | 0%         |
| Hispanic/Latino       | 3         | 23.1%      |

The descriptive survey provided information about the college experience also (Table 2). Six of the students were freshman (46.1%), three were sophomores (23.1%), one was a junior (7.7%), and three were seniors (23.1%). Additional information collected from the descriptive survey indicated five students reported “yes” to previously being enrolled at another institution

(38.5%) whereas eight students answered “no” to ever being enrolled at a different institution (61.55%).

Information pertaining to previous employment was gathered on the descriptive survey (Table 2). Nine students (69.2%) reported previously or currently gainfully employed with a minimum of five hours per week of work with four students (30.1%) reported no work experience. Employment post high school has been a concern for students with ASD. Using national data, Shattuck et al. (2012) stated that youth with ASD had the lowest rates of participation in employment. Barnhill (2007) related the employment concerns with the combination of social communication, social skills, and the timely ability to think and respond (executive functioning skills). The data collected in this study revealed a positive increase in employment opportunities for college students with ASD. The 69.2% of students with ASD reportedly having work experience is similar to the study by Grigal, Hart, and Migliore (2011) stating that 71% of students with intellectual disabilities had paid jobs since high school. In comparison, 90% of individuals with other types of disabilities reported paid jobs since high school (Grigal et al., 2011). Intellect is important, but the application and execution of tasks are crucial for the work setting.

All of the students completing the survey lived on-campus in the residence hall, and only one student (7.7%) had a roommate while 12 students with ASD (92.3%) indicated having no roommate in college. In contrast, Cai and Richdale (2016) reported 61% of the participants with ASD in their study lived with the parents while attending college and 68% lost interest in the university. Cullen (2015) and Mitchell and Beresford (2014) reported roommate and living environments to be areas of concern for students with ASD in the qualitative studies. The

students enrolled in the comprehensive program in the current study have the option for a single room for the additional cost which most utilized as indicated in the results.

Table 2

*College and Employment of Students with ASD from Descriptive Survey*

|  | N  | Percentage |
|--|----|------------|
| Previously Enrolled at another institution                           |    |            |
| Yes  | 5  | 38.5%      |
| No   | 8  | 61.5%      |
| Current Class Standing   |    |            |
| Freshman   | 6  | 46.1%      |
| Sophomore  | 3  | 23.1%      |
| Junior   | 1  | 7.7%       |
| Senior   | 3  | 23.1%      |
| Previously or currently gainfully employed (minimum of 5 hours/week) |    |            |
| Yes  | 9  | 69.2%      |
| No   | 4  | 30.8%      |
| Student Residency in college   |    |            |
| Resident Hall  | 13 | 100%       |
| On-campus apartment  | 0  | 0%         |
| Roommate in college  |    |            |
| Yes  | 1  | 7.7%       |
| No   | 12 | 92.3%      |

The descriptive survey gathered information from the student regarding their parent's household income and educational level (Table 3). The parent's annual household income reported on the survey included one student (8.3%) reported less than \$25,000, two students (16.7%) between the range of \$50,001-\$75,000, one student (8.3%) indicated the income was between \$75,001-\$100,000, two students (16.7%) reported \$100,001-\$150,000, and half (50%)

of the participants responded as unknown. The family income level of the students with ASD at the Mid-west, state university varied from the participants in study by Anderson and Butt (2017) with participants in the Mid-Atlantic region. However, half of the participants in the current study indicated the family income level was unknown.

Table 3

*Parent's Household Income and Educational Level*

|   | Count (N) | Percentage |
|---|-----------|------------|
| <b>Parent's annual household income</b> |           |            |
| <\$25,000                               | 1         | 8.3%       |
| \$25,000-\$50,000                       | 0         | 0%         |
| \$50,001-\$75,000                       | 2         | 16.7%      |
| \$75,001-\$100,000                      | 1         | 8.3%       |
| \$100,001-\$150,000                     | 2         | 16.7%      |
| >\$150,001                              | 0         | 0%         |
| Unknown                                 | 6         | 50%        |
| <b>Maternal Education level</b>         |           |            |
| Some high school                        | 2         | 15.4%      |
| Some college                            | 2         | 15.4%      |
| Bachelor's degree or higher             | 9         | 69.2%      |
| <b>Paternal Education level</b>         |           |            |
| Some high school                        | 1         | 7.7%       |
| Some college                            | 2         | 15.4%      |
| Bachelor's degree or higher             | 9         | 69.2%      |
| Unknown                                 | 1         | 7.7%       |

The participants also reported the educational level of their mother and father (Table 3). As for maternal education level, participants reported two (15.4%) with some high school, two

(15.4%) with some college, and nine (69.2%) with an undergraduate degree or higher. In terms of paternal educational level, participants reported one (7.7%) with some high school, two (15.4%) with some college, nine (69.2%) with undergraduate degree of higher, and one (7.7%) reported unknown. In comparison, Wei et al., (2014) indicated 86.45% of the parents with ASD attended postsecondary education compared to 13.55% that never attended college.

Table 4

*Student Supports*

|   | Count (N) | Percentage |
|---|-----------|------------|
| Supports accessed while enrolled in classes/on-campus |           |            |
| Career Counseling                                     | 3         | 23.1%      |
| Counseling services                                   | 4         | 30.8%      |
| Health Services                                       | 8         | 61.5%      |
| Student Organization/Club                             | 6         | 46.2%      |
| Student Success Center                                | 3         | 23.1%      |
| Tutoring (departmental)                               | 3         | 23.1%      |
| Writing Center  | 4         | 30.8%      |
| First semester in college                             | 6         | 46.2%      |

Lastly, the participants of the survey reported the student supports accessed while enrolled at the university (Table 4) and listed their major/minor. The 13 participants were able to check all that applied regarding supports accessed while on campus or enrolled at the institution. Four students (30.8%) sought out counseling services, and eight students (61.5%) used Health Services. Four participants (30.8%) accessed the Writing Center, three individuals (23.1%) indicated using Student Success Center, and three students (23.1%) used departmental tutoring.

Three students (23.1%) accessed Career Counseling. Six students (46.2%) participated in a student organization or club, and six students (46.2%) reported being in the first semester in college when completing the survey. Roux et al. (2015) found that “less than half (48.6%) of those who disclosed their disability to the school reported receiving services, accommodations” (p. 4). Some of the students with ASD in the current study are accessing the student supports on campus, however the new freshman (46.2%) might be impacting the results based on their limited time on campus.

Table 5

*Declared Majors and Minors of students with ASD*

| <b>Class</b> | <b>Major</b>            | <b>Minor</b>              |
|--------------|-------------------------|---------------------------|
| Freshman     | Digital Media           |                           |
|              | German/History          |                           |
|              | Art and Design          | Graphic Design            |
|              | English Education       |                           |
|              | Music                   | 2D animation              |
|              | Pre-medicine            |                           |
| Sophomore    | Undecided               | Music                     |
|              | TV and film productions | Film studies/theater arts |
|              | Therapeutic recreation  |                           |
| Junior       | Political Science       |                           |
| Senior       | Journalism              |                           |
|              | History                 |                           |
|              | Communication Studies   | Modern Technology         |

The participants in the study listed their current major (Table 5) with the following responses: art and design, communication studies, digital media, English education, German, history, journalism, music, political science, pre-medicine, therapeutic recreation, TV and film production, and undecided. Five students listed minors with the following: film studies/theater, arts media technology, music, 2D animation, and graphic design. In comparison, the participants in Gelbar et al. (2015) also indicated majors in a variety of fields including 29% liberal arts, 8% social science/law, 5% Science/Medicine, 3% education, 3% computers, 1% business, and 4% undeclared. All of the students reported to be in academic good standing with the university when completing the survey.

### **Summary of the Results**

After receiving approval from the Institution Review Board of the one university, the researcher contacted the director of the program to obtain the necessary program information for the correlational research design. The anonymous data was coded and compiled in an Excel file. The data received from the program contained four semesters (Fall 2016, Spring 2017, Fall 2017, Spring 2018) of data relevant to this study (i.e. guided study table hours, grade point average, and program evaluation results). Data from students enrolled in the full transitional program were included in the study. The data was imported to SPSS for analysis.

The program at the university has implemented a maintenance program with different requirements for the students than the full program. Students in the maintenance program have completed a minimum of one semester in the full program and have been recommended by program staff for the maintenance program. In addition, guided study tables are optional for students in the maintenance program compared to the full program. Therefore, the students in the maintenance program were omitted from the study, and students with autism spectrum

disorder enrolled in the full transitional program were used for this study. All of the students enrolled in the program in Fall 2016 and Spring 2017 participated in the full program and were included in the study. The list of anonymous data from Fall 2017 and Spring 2018 included both students in the full program and maintenance program. Only students in the full program were included in the study. This study did not contain a comparative group. Students who withdrew from the university prior to completing the semester were not included in the data.

The anonymous data received from the director included the students enrolled in the program for that semester. For example, Fall 2016 included information on 13 students with the average number of hours, grade point average, and results from specific questions on the program evaluation. The next semester, Spring 2017, listed the information for 11 students with the same information. The program does admit new students in both fall and spring. The study did not take into account the number of semesters a student was enrolled in the comprehensive program. At the end of each semester, the student received a recommendation for the next semester. The recommendations can include continuing in the full program, reducing to maintenance support level, dismissed from program to be independent at the university. At times, students might withdraw from the university or transfer to a different institution. Only students with ASD in the full program were included in the study, and the study did not separate first semester students from multiple semester students enrolled in the comprehensive program.

A correlational analysis was used to determine the relationship between the variables of the study related to academic success and development of executive functioning skills. The analysis of the data points connected to the conceptual and theoretical framework of the research study. The purpose of the study was to investigate the relationship between guided study tables

and the executive functioning skills of college student with autism spectrum disorder in the transition to the university setting.

The conceptual framework for the study specifically focused on the related executive functioning skills (i.e. flexibility, self-awareness, time management, and self-advocacy) incorporated and measured while enrolled in the program. Fehy and Richard (2016) defined executive functions as the cognitive processes necessary to manage oneself and resources to achieve a goal. Executive functioning skills area especially important in the transition to the new postsecondary educational environment.

The transition from high school to college is multifaceted, and the study incorporated the student development theories, specifically the Schlossberg's transition theory, into the design of the study. The students need the functional, foundational skills and awareness necessary in the first semester to be successful and gain independence in the new environment (Anderson, Goodman, & Schlossberg, 2012). The new roles, routines, and relationships need to be developed, supported, and established (Barclay, 2017). The study was designed to investigate the participation in the guided study tables and the development of the executive functioning skills and foundational skills outlined in Schlossberg's Transition Theory for academic success and independence in the university setting.

**Validity.** Correlational analysis studies are susceptible to many threats for both internal and external validity. Credibility was the ultimate goal through reducing or eliminating the threats to validity. Specific aspects that can threaten internal validity include history and maturation (Creswell, 2014). History can be a threat to the internal validity since the students enrolled in the transitional education program receiving the 10 hours of weekly support had additional events occurring in the environment at the same time as the research project was

taking place impacting the findings. Besides the other components of the program, the students have family, classmates, and resident hall peers/acquaintances influencing the student on the college campus.

The researcher selected guided study tables which is a specific, six-hour requirement of the program. The other requirements of the program consist of approximately four hours in smaller increments of interaction. For example, weekly social activities with a peer might range from 30-90 minutes, academic appointments are usually 30 minutes per week, and support group is 60 minutes per week. The combined activities usually result in direct contact with the student four to five days each week.

Maturation can be a threat to the internal validity since the young adult with ASD attending college and transitioning from high school or another institution continue to change over the semester gaining intellect, maturity, and independence that all college students experience. Multiple semesters were analyzed to increase credibility of the study. ASD is a developmental disorder which can result in atypical development which needs to be considered in the analysis of data. Participants with ASD vary in their development of social communication; restrictive, repetitive behaviors, and co-morbid conditions.

Internal validity can also be threatened by the backgrounds of the individuals involved in the research study. Students with ASD vary regarding the level of communication, social interaction, and family involvement. All the students were admitted to the university through the formal admission process. No additional information was collected through formal testing, high school transcripts, or past individual education plans (IEPs). All the students disclosed the documented disability of ASD to the Office of Student Disability services and indicated on the survey as being diagnosed with ASD or a similar disability (i.e. PDD-NOS, Asperger's, high-

functioning autism). The date of diagnosis, previous interventions/supports, or other co-morbid diagnosis were not obtained at this time.

The mentors, and graduate assistants also change each semester/year which can impact the findings in the study. Mentors are undergraduate students enrolled in a variety of majors with different backgrounds and experiences with ASD. The amount of direct interaction and the individual's comfort or experience with autism spectrum disorder can impact the variables used in the study. For example, a mentor might have a family member with autism spectrum disorder compared to other mentors impacting comfort and interactions. The graduate assistants employed with the program have been graduate students in the Communication Disorders and Sciences department at the university. Past participation in the undergraduate years with the program was not taken into account. Each graduate assistant presents with different levels of experience, knowledge, and comfort with working with college students with ASD. The current study did not have a control group or pre- and post- measurements to reduce the potential threats to the credibility of the research study.

Instrumentation was another potential threat to validity since the program evaluation was a non-standardized, internal tool used to evaluate the student's level of independence at the end of the semester to communicate to parents and students and make recommendations for the next semester. The study did not incorporate a baseline of executive functioning skills of the students entering the university for comparison. The researcher only selected questions from the program evaluation specifically related to executive functioning skills while also incorporating grade point average measurements for academic success. In this correlational design, there was no manipulation of variables, as there is no experimental or treatment control groups. Potential threats to external validity exist due to the research findings being collected at one specific

university with an established program. Caution was implemented in terms of generalizing the findings beyond the research project.

**Reliability.** The students selected to participate in the study were admitted to the state university based on his/her own merit through the formal application process. After admitted, the student is required to disclose the disability of autism spectrum disorder to the Office of Student Disability Services to then separately apply to the fee-based program that provides additional supports in academics, social, and daily living skills. Enrollment is based on an interview with the student with ASD and availability to the program. No random selection was incorporated into the study.

SPSS Version 23 was used to analyze the numerical data using a Pearson's correlation coefficient test to find the relationship between the independent and dependent variables. The strength of a linear relationship can be determined using the Pearson product moment correlation coefficient ( $r$ ). A Pearson's correlation coefficient test was appropriate for this statistical analysis to measure the linear correlation between two variables.

Three types of correlation can result in the analysis: positive correlation, negative correlation, and no correlation. A positive correlation would indicate an increase in one variable leads to an increase in the other or a decrease in one leads to a decrease in the other variable. A negative correlation would result in an increase in one variable leading to a decrease in the other (Creswell, 2014). No correlation reveals a change in one variable does not impact the outcome of the other variable. A correlational study includes the raw data, correlational coefficient ( $r$ ), sample size ( $n$ ), and probability of common error ( $p$ ). The hypothesis testing process was selected in order to consider whether the relationship between variables is significantly different than would be expected by chance alone (Adams & Lawrence, 2015).

A hypothesis was formulated for each research question:

**Null hypothesis 1:** There is no relationship between the number of hours of guided study tables and academic success (grade point average) of the students.

**Alternate hypothesis 1:** There is a relationship between the number of hours students recorded in guided study tables and the academic success of the student with ASD.

**Null hypothesis 2:** There is no relationship between the number of hours of guided study tables and the level of independence related to executive functioning skills in the college setting as measured on the student's program evaluation.

**Alternate hypothesis 2:** There is a relationship between the number of hours of guided study tables and the executive functioning skills necessary to be independent for college students with ASD.

A linear regression analysis was used to further analyze the significance of the relationships identified in each hypothesis above and build a mathematical predictor model. A significance level of  $p=.05$  was used for each hypothesis test which would indicate there was a five percent chance or less of being wrong in concluding significant relationship. Several methods are available to test the significance of the relationship between variables. Both the Analysis of Variance method and the t-test for the significance for the model parameters are appropriate.

If the  $p$ -value was less than the stated significance of 0.05 for the analysis, the null hypothesis was rejected. In addition, the coefficient of correlation,  $r$ , was used as an indicator of association between the variables. The square of the correlation coefficient, coefficient of determination  $r^2$ , provides a measurement of the proportion of the variation in the first variable,  $y$ , that can be explained by the variation in the second variable,  $x$ . It is generally expected that  $r^2$

value of 0.80 or higher indicates a model good enough to be used for prediction purposes. The data were represented on a scatterplot to display the relationship between the two variables.

### **Detailed Analysis**

Analysis of the data was completed by first completing a bivariate correlational examination of the variables. If the results indicated a two-tailed significance with less than a .05 significance, then further analysis of the Pearson Correlation was completed using SPSS. When possible, a linear regression of the variables that resulted in a significant difference was calculated to determine the  $r^2$  value, the statistical measurement of how close the data are to the fitted regression line. Predictability was also calculated using a predicted variable equation (Creswell, 2014).

**Research question 1.** *What is the relationship between guided study tables and the academic success (G.P.A.) of students with ASD in a transitional, comprehensive educational program?*

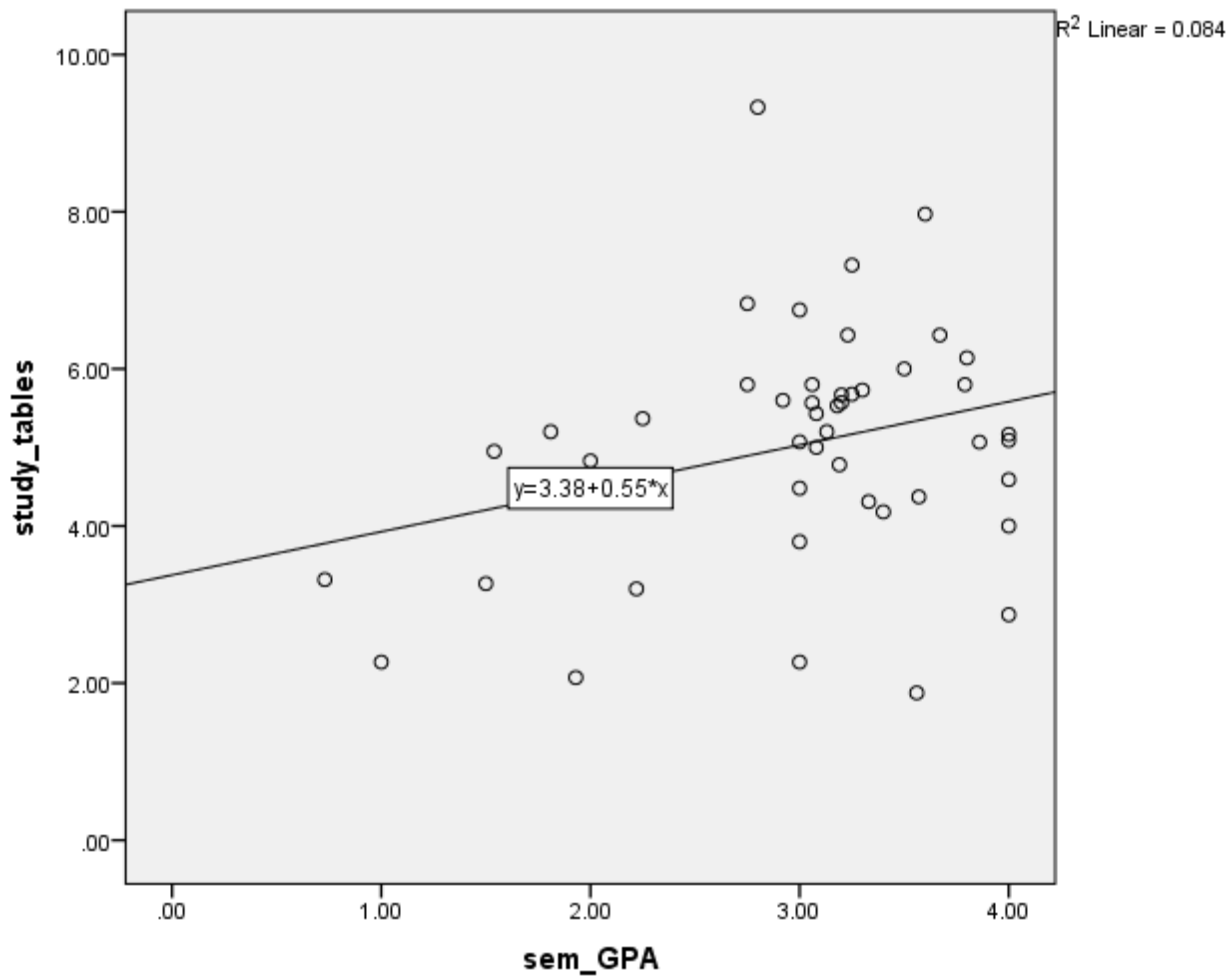
A correlational analysis was conducted to investigate the relationship between the number of hours a student with autism participated in guided study tables while enrolled in a comprehensive, transitional program and the academic success of the student measured through the grade point average of the same semester. The correlation coefficient,  $r$ , computed revealed a statistically significant relationship between the number of hours of guided study tables and grade point average,  $r(45) = .290, p = .048$ . This indicates a moderate positive relationship between the number of hours in guided study tables and the academic success. In general, the students who participated in the required number of study tables or more were associated with a higher grade point average. The null hypothesis was rejected.

The average number of hours in guided study tables for the 47 students in the program over the four semesters was 5.03 hours with a range from 1.88 hours to 9.33 hours. Guided study tables had a standard deviation of 1.49. As for grade point average, the mean was 2.99 with a range from 0.73 to 4.0. The standard deviation was 0.78.

Further analysis using a linear regression analysis was conducted with the number of guided study table hours and the grade point average of the student for the semester. The scatter plot of the two variables indicated the two variables were linearly related such that as the number of hours increased the grade point average also increased (see Figure 1). The regression equation for predicting the needed number of guided study tables is as follows:

$$\text{Guided study tables hours} = 3.376 + (.552) \text{ desired grade point average}$$

The predictability of the guided study table hours was statistically significant. Approximately 8% of the variance in guided study table hours was accounted for by its linear relationship with the grade point average for the semester. In the transition to the university setting, the regression equation provides a starting point for families and students when determining participation in guided study tables as a support for college students with ASD. Students with greater participation in guided study tables were expected to have higher semester GPA.



*Figure 1. Scatter Plot of the Number of Hours in Guided Study Tables and the Semester Grade Point Average*

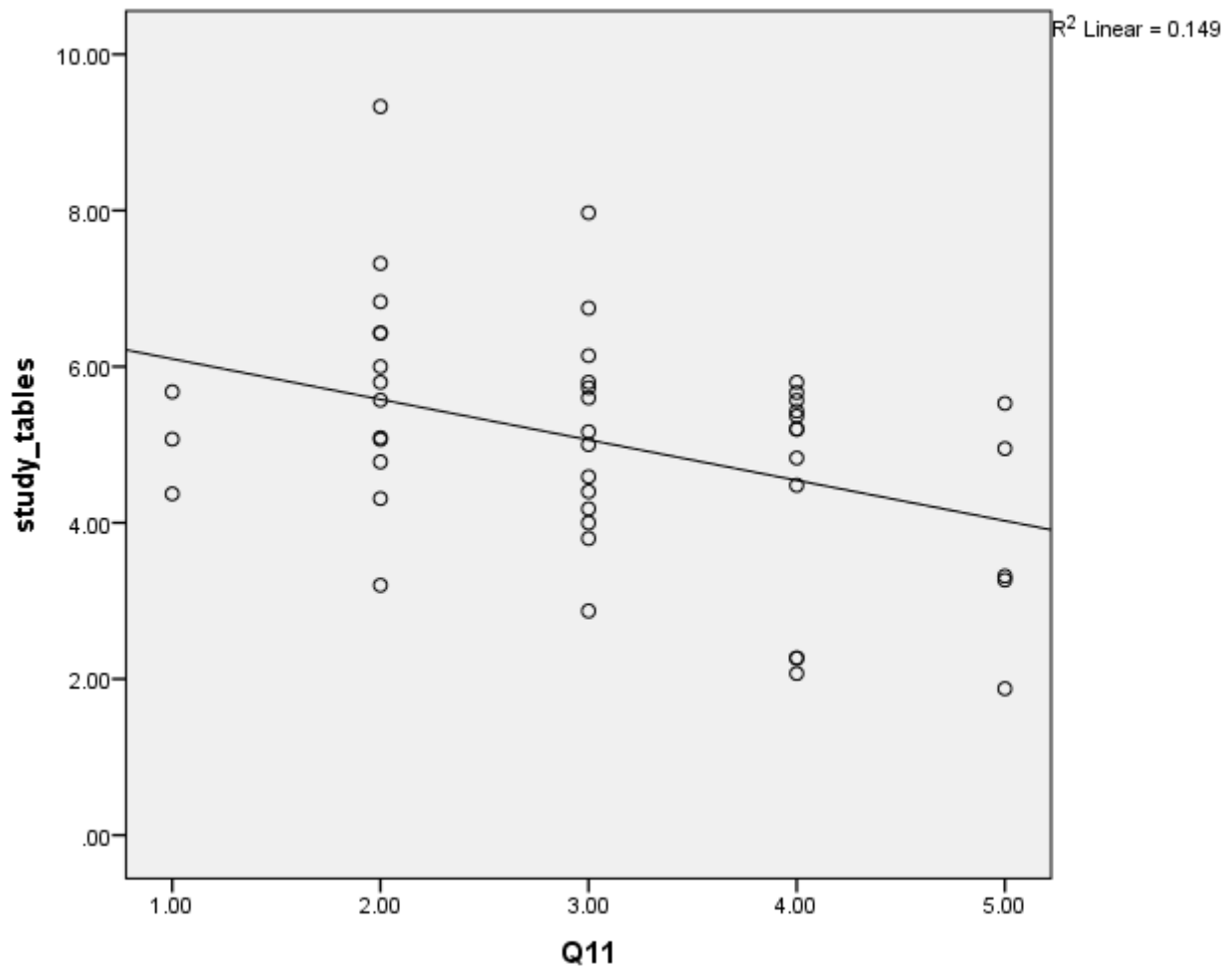
**Research question 2.** *What is the relationship between participation in the guided study tables and executive functioning skills necessary for independence on the college campus?*

Data from the program related to this research question involved the scores of specific questions on the program evaluation completed at the end of each semester for individual students. Questions 1, 3, 11, and the average of these three scores were incorporated in the analysis of data to answer this research question (see Appendix D). A correlational analysis was

calculated using the number of guided study table hours and the program score for each individual question. The results are analyzed in the following paragraphs.

A correlational analysis was conducted to investigate the relationship between the participation in guided study tables and the executive functioning skills necessary to be independent on the college campus measured on the informal, student evaluation at the end of the semester. Three specific questions were selected from the internal program evaluation that was closely related to executive functioning skills. Question #1 stated, “Student demonstrates flexibility and self-awareness.” Pearson Correlation returned a value of  $r(45)=-.224, p=.130$  for the relationship between the number of guided study tables and the demonstration of flexibility and self-awareness on the college campus. Questions 3 on the program evaluation stated, “Student is independent in time management skills.” The Pearson Correlation revealed a value of  $r(45)=-.129, p=.386$ . No statistical difference was found for questions 1 (executive functioning skills: flexibility and self-awareness) and question 3 (executive functioning skills: time management skills).

The correlational coefficient,  $r$ , computed revealed a statistically significant relationship between the number of hours in guided study tables and question 11 on the program evaluation,  $r(45)=-.387, p=.007$ . Question 11 asked, “Student’s overall independence and self-advocacy at the university level.” The results indicate a relationship between the number of hours in guided study tables and the development independent, executive functioning skills necessary for college life. Greater involvement in guided study tables resulted in a lower rubric score demonstrating greater independence. A statistical difference was found for question 11 (executive functioning skills: overall independence and self-advocacy). Therefore, the null hypothesis was rejected.



*Figure 2.* Scatter Plot of Number of Hours in Guided Study Tables and the Score on the Program Evaluation for Question 11

Further analysis using a linear regression analysis was conducted with the average number of weekly study table hours in a semester and the program evaluation scores of question 11 (Student's overall independence and self-advocacy at the university level). The scatter plot of the two variables indicated the two variables were linearly related such that as the number of hours increased the rubric scoring decreased indicating greater independence in the university

setting with executive functioning skills as measured on the non-standardized, student evaluation at the end of the semester (see Figure 2).

Additional analysis was conducted involving the relationship between the average number of guided study tables and the average of the three scores (Questions 1, 3, 11) from the program evaluation questions related to executive functioning skills. No statistically significant relationship was revealed,  $r(45)=-.274, p=.062$ . In summary, only question 11 resulted in a statistically significant relationship in terms of participation in guided study tables and the evaluation of executive functioning skills of college students with ASD on the program evaluation questions related to executive functioning skills.

Consequently, based on the results of the study, the number of hours in guided study tables impacted self-advocacy skills. The regular participation possibly allowed the students with ASD additional, consistent opportunities to ask for help or inquire about information in a comfortable situation over an extended period of time. In contrast, time management, flexibility, and self-awareness did not demonstrate a significant relationship when using the average number of guided study tables and the results from the program evaluation. The structure and routines incorporated into the full, comprehensive, transitional program might limit the opportunities for students to demonstrate independence in the areas of time management, flexibility, and self-awareness.

The program provided data of four semesters in which guided study tables hours, grade point average, and program evaluations were conducted. Consequently, the four semesters provided the researcher with a total of 47 students enrolled in the full program over the four semesters (Fall 2016:  $n=13$ ; Spring 2017:  $n=10$ ; Fall 2017:  $n=13$ ; Spring 2018:  $n=11$ ). When analyzing the same research questions for individual semesters, the results varied from the four

semesters combined (see Table 7). In Fall 2016, the relationship between the number of guided study table hours and level of independence measured on question 11 of the program evaluation was statistically significant. This related to the previous data and rejection of the null hypothesis of the average number of guided study tables positively impacting the overall independence and self-advocacy at the university level as measured in question number eleven on the program evaluation. The utilization of four semesters and additional data points provided supportive evidence for guided study tables.

Table 6

*Summary of Individual Semesters and Data to Correspond with Results of Program Evaluations*

| <b>Correlations</b>       | Study<br>tables<br>and<br>GPA | Study<br>Tables and<br>Question 1 | Study<br>Tables and<br>Question 3 | Study<br>Tables and<br>Question<br>11 | Study<br>Tables and<br>average of<br>Q1,3,11 |
|---------------------------|-------------------------------|-----------------------------------|-----------------------------------|---------------------------------------|--|
| <b>Fall 2016 (N=13)</b>   |                               |                                   |                                   |                                       |  |
| Pearson Correlation:      | .254                          | -.310                             | .019                              | -.566                                 | -.330  |
| Significance (2-tailed):  | .402                          | .303                              | .950                              | .044**                                | .270   |
| <b>Spring 2017 (N=10)</b> |                               |                                   |                                   |                                       |  |
| Pearson Correlation:      | .454                          | -.191                             | -.590                             | -.456                                 | -.490  |
| Significance (2-tailed):  | .188                          | .597                              | .073                              | .185                                  | .151   |
| <b>Fall 2017 (N=13)</b>   |                               |                                   |                                   |                                       |  |
| Pearson Correlation:      | -.035                         | -.126                             | -.234                             | -.045                                 | -.120  |
| Significance (2-tailed):  | .909                          | .682                              | .442                              | .883                                  | .695   |
| <b>Spring 2018 (N=11)</b> |                               |                                   |                                   |                                       |  |
| Pearson Correlation:      | -.292                         | .014                              | .499                              | -.074                                 | .186   |
| Significance (2-tailed):  | .384                          | .967                              | .118                              | .830                                  | .584   |

\*\*Less than .05 indicating a significant relationship

The analysis of results indicated a statistically significant relationship between the number of hours of study tables and the student's grade point average ( $p=.048$ ) but this only explained eight percent of the variability in the guided study table hours. Similarly, the relationship between the number of hours in guided study tables and the program evaluation score for question 11 (Student's overall independence and self-advocacy at the university level) resulted in a statistically significant relationship ( $p=.007$ ) with a 15% of variance.

Table 7

*Summary of Fall Semesters Compared to Spring Semesters with Data to Correspond with each Research Question*

| <b>Correlations</b>                             | Study<br>tables<br>and<br>GPA | Study<br>Tables and<br>Question 1 | Study<br>Tables and<br>Question 3 | Study<br>Tables and<br>Question<br>11 | Study<br>Tables and<br>average of<br>Q1,3,11 |
|---|-------------------------------|-----------------------------------|-----------------------------------|---------------------------------------|--|
| <b>Fall 2016 &amp; Fall 2017 (N=26)</b>         |                               |                                   |                                   |                                       |  |
| Pearson Correlation:                            | .348                          | -.273                             | -.076                             | -.470                                 | .106   |
| Significance (2-tailed):                        | .082                          | .176                              | .713                              | .015**                                | .605   |
| <b>Spring 2017 &amp; Spring 2018<br/>(N=21)</b> |                               |                                   |                                   |                                       |  |
| Pearson Correlation:                            | .195                          | -.121                             | -.186                             | -.286                                 | -.231  |
| Significance (2-tailed):                        | .398                          | .600                              | .420                              | .209                                  | .313   |

\*\*Less than .05 indicating a significant relationship

After analyzing the individual semesters, the researcher divided the data into fall semesters and spring semesters to investigate a difference between the different semesters of the school year (see Table 7). Once again, incorporating all four semesters resulted in the best response to the research questions. The small sample size for single semesters resulted in support of the null hypothesis to all research questions. However, when all the data is compiled in a longitudinal study, the null hypotheses of the research questions were rejected. The number of hours in guided study tables had a positive relationship to semester grade point average. Additionally, greater participation in guided study tables resulted in improved scores with self-advocacy and overall independence in the college setting.

The analysis of the mean scores for each data point revealed specific information regarding each data set (see Table 8). The students in the program agree to participate in a minimum of six hours per week of study tables, however the mean number of hours achieved weekly was 5.03 hours ( $SD=1.49$ ;  $N=47$ ). The mean grade point average for the students was

3.00 ( $SD=.78$ ;  $N=47$ ). The non-standardized, internally created program evaluation used a five-point Likert scale (5=fully dependent/maximum assistance; 4=moderate support; 3=minimal support; 2=monitoring; 1=independent) in which five indicated dependence on the program or supports and one equaled independent on the college campus in the selected area. The sample group achieved a mean score of 3.36 ( $SD=1.2$ ) on Question 1 measuring flexibility and self-awareness in the college environment. The average score was closer to minimal support than moderate support. Question 3 on the program evaluation measured the student's independence in time management skills with a mean of 2.87 ( $SD=1.24$ ). The mean score indicated numbers between monitoring and minimal support on the program form key. Lastly, question 11 measured the student's overall independence and self-advocacy at the university level with the mean score of 3.06 ( $SD=1.11$ ) indicating the students on average continue to receive/need minimal support.

Table 8

*Means and Standard Deviations of Data*

|  | Mean | Standard deviation | N  |
|--|------|--------------------|----|
| <b>Average number of guided study table hours</b>                                | 5.03 | 1.49               | 47 |
| <b>(Range)</b> (1.88-9.33)   |      |                    |    |
| <b>Grade point average--4.0 Scale</b>  | 3.00 | .78                | 47 |
| <b>(Range)</b> (0.73-4.0)  |      |                    |    |
| <b>Question #1 rubric score</b><br>(5=dependent; 1=independent)                  | 3.36 | 1.2                | 47 |
| <b>Question #3 rubric score</b><br>(5=dependent; 1=independent)                  | 2.87 | 1.24               | 47 |
| <b>Question #11 rubric score</b><br>(5=dependent; 1=independent)                 | 3.06 | 1.11               | 47 |
| <b>Average rubric score of Questions #1,3,11</b><br>(5=dependent; 1=independent) | 3.11 | 1.02               | 47 |

## **Summary**

The chapter presented the results of the study and described the techniques used to analyze the data and answer the research questions. The descriptive survey provided demographic information about the students diagnosed with autism spectrum disorder attending a 4-year, comprehensive university and enrolled in a transitional program designed to provide additional supports for students with ASD in the transition to the university setting. A correlational study utilizing the data from the transitional program provided the necessary information to answer the research questions of the study.

The research study was investigating two research questions. The first question related to the relationship between a specific component of the transitional program (guided study tables) and the academic success of the students with ASD in the university setting. The second research question investigated the relationship between the guided study tables and the executive functioning skills of college students with ASD necessary for independence in the college setting. The null hypothesis of both questions were rejected utilizing four semesters of data obtained from the university's program. The following chapter will present the discussion and conclusions of this study based on the data analysis and results.

## **Chapter 5: Discussion and Conclusion**

### **Introduction to the Discussion and Conclusion**

The research related to ASD has evolved to provide further opportunities for adults with autism. Evidence-based practices specifically for individuals with ASD has resulted in additional services throughout early intervention, early childhood education, and K-12 education (Reichow, Doehring, Cicchetti, & Volkmar, 2011). In turn, students participate in inclusive education including common core curriculum and college preparatory courses. Students with ASD are receiving better support to help prepare for post-secondary education and/or employment.

The outcome data related to individuals with ASD continue to be an area of concern. Employment rates for individuals with ASD ranged between 4.1% and 11.8% (Taylor & Seltzer, 2011; Wehman et al., 2014) and the national data indicated only 35% of students with ASD attend post-secondary education (Nasamran, Witmer, & Los, 2017; Shattuck et al., 2012). The data shows that over 50% of the students with ASD do not participate in post-secondary education or employment after the high school experience regardless of cognitive level (Shattuck et al., 2012). Shattuck et al. (2012) concluded the ASD group had the highest rate of no participation in postsecondary education or employment compared to three other eligibility categories including language impairment, learning disability, and mental retardation. The statistics exposed a problem that needs to be researched and addressed.

The transition from high school to college presents new challenges for students with ASD. The routines and supports established in high school vary significantly in two- and four-year institutions. Therefore, educational supports and opportunities that meet the specific needs of students with ASD will need to be implemented to improve the outcomes for individuals with

ASD. Preliminary research studied the challenges, needs, and accommodations necessary for students with ASD in the transition to post-secondary education (Accardo, Kuder, & Woodruff, 2018; Anderson, McDonald, Edsall, Smith, & Taylor, 2015; Barnhill, 2016; Cox et al., 2017). Based on this information, programs and supports have been developed designed to meet the challenges presented by individuals with ASD.

Academics, social interaction, and daily living skills present challenges for students with ASD in the college setting (Accardo et al., 2018; Kuder & Accardo, 2018; Van Hees, Moyson, & Roeyers, 2015). Specific supports have been implemented to support isolated areas such as peer mentors to support social interaction, study skill courses to help with academics, or organizational supports to learn strategies (Ames, McMorris, Alli, & Bebko, 2016; Ashbaugh, Koegel, & Koegel, 2017; Roberts & Birmingham, 2017). Comprehensive programs have also been developed which consists of multiple components with specific goals to support students with ASD in the college setting (Retherford & Schreiber, 2015; Zager & Alpern, 2010).

With the development of new supports and programs, ongoing research will continue to help navigate the best practices to support the students in post-secondary education and in time improve the outcome data related to individuals with ASD. The current research study utilized a comprehensive, transitional program as a starting point to investigate the relationship between a specific support (guided study tables) of the program and the impact on academic success. Additionally, the study included the investigation of the relationship between the participation in the guided study tables and development of executive functioning skills necessary for independence at the college setting.

Chapter 5 will discuss the results of the study and provide conclusions related to the field of study. The results from chapter four will be first summarized and discussed especially in

relationship to the literature and frameworks of the study. The limitations, implications, and recommendations for future research will be discussed to culminate the discussion of the research study. The findings contribute to the limited research and help guide future studies related to college students with ASD.

### **Summary of the Results**

The primary purpose of this study was to explore the supports and services available to college students with autism spectrum disorder in the transition to post-secondary education. The study specifically examined the relationship between the executive functioning skills of college students with ASD in a transitional education program. The following research questions guided the study:

RQ1: What is the relationship between guided study tables and academic success (G.P.A.) of students with ASD in a transitional, comprehensive program?

RQ2: What is the relationship between participation in the guided study tables and development of executive functioning skills needed for independence of the college campus?

Multiple components impact the success of college students with ASD (Anderson, Carter, & Stephenson, 2018; Elias & White, 2018; Pinder-Amaker, 2014). The current study specifically focused on the transitional supports in place to establish the executive functioning skills necessary for academic success and independence in the college setting. The characteristics directly associated with ASD include social communication deficits and restrictive, repetitive behaviors (American Psychiatric Association, 2013). Jones et al. (2018) discussed the cognitive difficulties relevant to ASD including executive functioning skills and Theory of Mind, the understanding of mental states of self and others such as beliefs, purpose, intent, and

perspectives. The executive functioning skills impact the social interaction and communication while also encompassing a range of cognitive processes especially “relevant to successful engagement in complex, novel and goal-oriented behaviors” (p. 96). The transition to post-secondary education requires the successful engagement of executive functioning skills which will then facilitate social interaction (Jones et al., 2018). The current study was designed to specifically analyze the supports connected to the executive functioning skills necessary for academic success and independence at the university.

In the transition to the college setting, Anderson, Goodman, and Schlossberg (2012) noted the “dramatic and unprecedented changes” (p. xiv) that challenge all individuals when transitions occur. The Schlossberg Transition Theory was utilized as the theoretical framework of the study to ensure students with ASD are receiving the supports necessary for the transition to the college setting. Schlossberg identified a transition as any event that results in changed relationships, roles, assumptions, and routines (Barclay, 2017). The comprehensive, transitional program was designed to assist with identifying and establishing the coping resources needed in the transition which Schlossberg identified as the 4 S’s: Situation, Support, Self, and Strategies (Anderson et al., 2012, p. 62). Guided study tables provided regular, frequent opportunities for the student to establish a support system in the new situations while developing new strategies to support the individual.

The study was significant because it contributed to the limited number of quantitative studies related to college students with ASD. Kuder and Accardo (2018) reviewed the research that involved programs and supports for college students with ASD and concluded with only eight studies with a total of 115 participants. Four of the eight studies incorporated single subject designs targeting a specific intervention with focus on behavioral skills training, video

feedback, video modeling, and behavioral therapy for problem solving skills (Kuder & Accardo, 2018; Pugliese & White, 2014). The current study utilized data over four semesters while investigating a specific support incorporated into a comprehensive, transitional program. The number of students with ASD in the college setting continues to increase (Cox et al., 2017). Studies contributing to the effectiveness of programs and supports related to the uniqueness of the needs of students will assist in the future success of the students (Kuder & Accardo, 2018).

Previous studies frequently incorporated surveys or Likert scales based on the feedback from students with ASD regarding accommodations or needed supports. Jansen, Petry, Ceulemans, Noens, and Baeyen (2017) focused on specific accommodations but did not relate this data to academic success or other outcome data. In contrast, other studies have initiated investigation of larger groups of students, specific programs, and measurements related to retention, completion, and academic performance. Shmulsky, Gobbo, and Donahue (2015) incorporated 30 first-year undergraduate students involved in a transition program specifically analyzing social pragmatic functioning skills utilizing grade point average and completion of the program. This study revealed data related to students with ASD in post-secondary education at a small college with enrollment of approximately 500 students. Similar to Shmulsky et al., (2015), the current study also utilized grade point average data for students enrolled in a transitional program at a state university with about 7,000 students enrolled.

In order to further expand the research, the current study utilized a comprehensive, transitional program. Weiss and Rohland (2015) provided descriptive data over the course of five years related to a coaching program for students with ASD enrolled in a university in Rhode Island. Weiss and Rohland (2015) provided comprehensive supports, and the study provided an overview of the five key components of the program including disability counselors,

communication coaches, peer coaches, social skills group, and campus supports. The results and discussion revealed that students with ASD needed support to assist with executive functioning skills, navigating the hidden curriculum, and transition to the complexity of the university environment (Weiss & Rohland, 2015). The current study utilized the information from the descriptive study to specifically start analyzing data related to comprehensive programs and outcome data related to individuals with ASD.

A quantitative correlational research design was utilized for this study with a descriptive survey to provide demographic information on the students in the program. The variables of the study needed to answer the research questions included the average number of hours in guided study tables, the semester grade point average of the student, and the results on the program evaluation related to executive functioning skills. The director of the program provided the data necessary, and the descriptive survey was distributed to past and current students still enrolled at the institution.

The results from the correlational analysis indicated a positive correlation between the number of hours participated in guided study tables and the semester grade point average of the student. Academic success at the university can be defined as remaining in academic good standing with a minimum cumulative grade point average of a 2.0. Students must achieve academic success to remain at the institution without risk of academic probation, warning, or dismissal. In high school, students on average attend school 35 hours a week (seven hours a day, five days a week). However, in college, classroom attendance corresponds with the number of semester hours (15 semester hours=15 hours of in-class attendance). Additional study time needs to be scheduled and implemented weekly outside of class attendance to achieve academic success. Guided study tables can provide the structure and time to actively study or complete

assigned work. Greater participation in guided study tables resulted in improved academic success.

The second research question was answered utilizing the guided study table hours and the results of the program evaluation specific to executive functioning skills for each student. The correlational analysis of guided study tables and individual executive functioning skills such as flexibility, self-awareness or time management measured on the program evaluation did not result in a statistical difference. However, the overall measurement in question 11 related to independence and self-advocacy did demonstrate a significant relationship (Appendix D). The results indicated that as the number of hours in guided study tables increased, the student demonstrated the necessary skills to receive a lower rating on the program evaluation corresponding with greater independence at the university setting. Students utilizing the guided study tables over time established greater independence and self-advocacy skills.

### **Discussion of the Results**

Multiple aspects of this study require further discussion. The results provide a starting point for analysis and discussion related to the supports and programs in place for students with ASD in the college setting. Data directly from the program provided evidence regarding the positive correlation between the participation in guided study tables and academic success. In addition, the study revealed increased participation in guided study tables also resulted in increased independence on campus and self-advocacy. Other factors need to be considered though prior to generalizing this information.

As discussed in Chapter 4, the results of the study determined the relationship between the variables (guided study tables, grade point average, and program evaluation results) was significant when utilizing four semesters of data. Individual semesters did not reveal the same

significance. Similarly, when fall and spring semesters were analyzed separately, the results were not the same as the collective result of the four semesters. The majority of the previous studies were completed over a short period of time usually one semester or one year with mixed results (Ames et al., 2016; Levin et al., 2015; Pugliese & White, 2014; N. Roberts & Birmingham, 2017). Utilizing multiple semesters and the data over an extended period of time resulted in the guided study tables being effective at this one university for students with ASD.

Another factor that needs to be taken into consideration when analyzing the data is the fact that each semester varied. The students in the program, the peer mentors overseeing each study tables, and the graduate assistants are all changing variables of the study impacting the results. The quality of time spent in guided study tables was not measured but would impact the results of the study. The personal characteristics and comfort level of the peer mentors can impact the involvement and effectiveness of the guided study tables. Kuder and Accardo (2018) suggested individual students require different supports, and the peer mentors may not have been able to accommodate accordingly each semester. In addition, the response of the student with ASD also impacts the results possibly due to the unique characteristics of ASD (Kuder & Accardo, 2018). Barnhill (2016) noted that programs struggle with funding and training staff to implement the supports at the university setting. The results of the study support the need for additional trainings and in-services to ensure the staff is trained to effectively benefit the students during the required contact hours.

Guided study tables were specifically chosen to investigate the effectiveness of this specific support on academic success and executive functioning skills. The results were positive for this support, however the other contact hours and supports incorporated into the comprehensive program may have also impacted the results. Previous studies have supported the

benefits of peer mentors in the college setting (Ames et al., 2016; Sarrett, 2018). Students with ASD in the program also participated in weekly mentor activities, support group, and academic appointments.

With awareness of the influence of the other supports, guided study tables appeared to be an effective practice for achieving academic success and developing self-advocacy skills as demonstrated on the program evaluation measurements. Self-advocacy is one of the multiple cognitive skills classified under the executive functioning skills (Reis, McGuire, & Neu, 2000). Multiple studies highlighted self-advocacy skills to be an integral skill necessary for success at the college level (Brown & Coomes, 2016; Ness, 2013; Van Hees et al., 2015; Wehman et al., 2014; White, Ollendick, & Bray, 2011). The students who participated regularly and frequently in guided study tables may have established the comfort and security needed in the transition to the new environment as discussed in Schlossberg's Transition Theory which in turn impacted the development of self-advocacy skill on the college campus. Therefore, guided study tables should be considered as an effective practice for college students with ASD especially in the first semester or year as the student transitions to the new setting and demands of the new environment.

Collectively, students transitioning to post-secondary education need the skills to achieve the learning objectives in the classroom while also balancing the new expectations of independent living. Students with ASD benefit from supports to succeed in the college setting (Kuder & Accardo, 2018). The combination of skills and practices continue to be studied to determine how to effectively support the students with ASD while also acknowledging the unique characteristics of each student (Accardo, Kuder, & Woodruff, 2018). In this study, guided study tables impacted the development of self-advocacy skills towards the independent

level. Other executive functioning skills such as time management, flexibility, and self-awareness were not impacted significantly in the study. Other measurements or supports need to be considered to reach the desired results.

The results of the study were impacted by the size of the sample and utilization of only one university. The descriptive survey provided demographic information of 13 students currently or previously involved in the transitional program. The Centers for Disease Control and Prevention (2016) reported the prevalence of ASD to be 1 in 59 children, and ASD is four times more common in boys than in girls. Compared to the national average, a greater percentage of males (84.6%) completed the survey compared to females with ASD (15.4%). Ideally, the male contribution would be about 75% and the female participation rate would have been closer to 25% to match the national average. The participants of the survey were either Caucasian (76.9%) or Hispanic/Latino (23.1%). Therefore, the results are a starting point for future studies and discussion of effective supports.

The students with ASD benefit from supports through the comprehensive, transitional program. The guided study tables appear to provide the structure and focus needed to incorporate time towards academic coursework resulting in academic good standing at the university. Retention matters, and the results of the study indicated a positive relationship between the number of hours in guided study tables and the grade point average of the student.

### **Discussion of the Results in Relation to the Literature**

Research identified the need for supports to assist students with ASD in higher education (Anderson et al., 2018; Cai & Richdale, 2016; White et al., 2016). In determining this need, all stakeholders including the parents, families, high school staff, college faculty, students, peer mentors, and university personnel were incorporated into the studies through surveys, focus

groups, and interviews. Based on the evidence, programs and supports have been implemented, but the impact or results of these supports continue to be unknown. Kuder and Accardo (2018) reviewed and summarized the research that incorporated supports that yielded data on program outcomes resulting in only nine studies.

The limited research related to outcome data for college students with ASD makes the current study beneficial to the community of practice. Institutions of higher education need to know what supports could benefit the students with ASD. The challenges identified in the research are being addressed in a variety of ways, and research needs to determine the effectiveness of the supports while also clarifying the skills possibly being targeted or developed through the support.

Another challenge in the research is determining how to measure success. The current study started with academic success as measured with semester grade point average. Positive performance in the classroom might impact overall well-being and willingness to attempt social interaction. Accardo (2017) researched the ways in which new colleges students with ASD define college success along with the factors that promote or inhibit the success. Interestingly, the majority stated getting good grades defined success in college while only 21% of students mentioned graduation. The top factor identified for influencing success included support from parents while the factors impacting success were anxiety/fear/stress and poor study skills (Accardo, 2017)

The current study incorporated grades through semester grade point average, and parent support is embedded in the program through the financial commitment and regular communication. Guided study tables may be an effective support to overcome the obstacles identified by providing the structure and routine to reduce anxiety while establishing the supports

and strategies in the new setting to help with study skills. The regular, scheduled, required six hours a week in guided study tables appears to help promote success and target the obstacles. The study benefits the community of practice due to the focus on one specific support and measuring success based on academic performance.

The design of the study was strategic to help institutions possibly find a feasible starting point for support or expand on current supports. The design could also be replicated by other institutions with ASD supports to compare findings and results. Past research has investigated peer mentors to possibly assist with the social integration and participation on the college campus (Ames et al., 2016; Hamilton et al., 2016; Siew et al., 2017). Even though positive, creating a mentoring program can be time consuming, possibly costly, and require intense contact. The development of a problem-solving course or specific skill training (Pugliese & White, 2014; Wenzel & Rowley, 2010) requires preparation and a knowledgeable instructor, and the measurement of success and carry-over of skills could be limited. Guided study tables might be a practice to help target a variety of skills based on the individual needs of the students with ASD. Jansen, Petry, Ceulemans, Noens, and Baeyen (2017) concluded that both “personal and environmental characteristics should be taken into account when selecting and implementing reasonable accommodations” (p. 71) for the students with ASD.

Even though the study occurred at one university while investigating a specific support of a comprehensive program, the results can be related to the current literature. Weiss and Rohland (2015) determined that the Communication Coaching Program (CCP) which comprehensively supported college students with ASD impacted college retention and completion. The key components of CCP implemented were disability counseling, communication coaching, peer coaching, social groups, and campus recourses (Weiss & Rohland, 2015). The results of the

current study revealed college students utilizing guided study tables in the comprehensive program positively impact the grade point average of the student which in turn promotes academic good standing at the university. The correlation between participation in guided study tables and independence related to self-advocacy is also a positive connection to the literature. Self-advocacy and self-determination for common themes occurring in the literature (Getzel & Thoma, 2008; Gillespie-Lynch et al., 2017; Test, Fowler, Brewer, Wood, & Ness, 2013) which need to continue to be explored.

The current study also benefits the literature due to the focus on guided study tables being a component of a comprehensive program that specifically focuses on transitional support to the college setting which is unique to the research with college students with ASD. Supports needed in the first semester or year might differ from the other years. Freshman and transfer students need to cope with the transition to the college setting, and the supports implemented in the early semesters for students with ASD might need to address the characteristics associated with the transition. Retherford and Schreiber (2015) addressed the transitional needs of students with ASD through a one-week campus experience for juniors and seniors in high school. Expanding the options for meeting the transitional needs of students with ASD in the college setting was explored in the study (Gelbar et al., 2014; White et al., 2017).

The results of the study will contribute to growing research and literature on college students with ASD. The possibilities and solutions are just starting to be explored, and there is a great need for relevant, evidence-based practices. The community of scholars will continue to investigate and work together with practitioners to create programs and implement supports that are beneficial to the students with ASD. The skills necessary for success and the services to improve those skills will be established through this collaboration. The current results provided

evidence to support guided study tables for the student with ASD in the program. Besides Roberts (2010) who incorporated the viewpoints of the mentees into his study, the literature lacks when it comes to the perspectives of others involved with the supports and success of the students with ASD.

### **Limitations**

The study was beneficial, but research can be improved or modified due to research design limitations. The limitations of this study involve multiple areas. The program, population, sampling, and measurements will be discussed and analyzed for limitations along with suggestions for strengthening and improving the study.

First, the study was limited due to the involvement of only one university and one program. One university with a comprehensive, transitional program provided a simple model of analysis as a starting point for research. Even though the guided study tables were a six hour weekly requirement of the program, other factors and aspects of the program can impact the results. Additional information from the students or mentors involved in the guided study tables would provide more evidence regarding how guided study tables impact the students with ASD and the specific skills targeted at each session. The study investigated executive functioning skills, but future studies can isolate executive functioning skills including self-advocacy, time management, study skills, problem solving, or self-awareness especially in the different semester and years of post-secondary education.

Another limitation of the study was the population sampled. The study focused on the data from the students with ASD. The involvement of other stakeholders would also benefit the field of study. Parents, mentors, faculty, program staff, and university support staff can provide input about the programs and supports provided to students with ASD. Even though the study

strategically tried to incorporate grades which would be assigned by professors, the program evaluation completed by the faculty and staff, and the concrete hours the students with ASD participated in guided study tables, the population sampled was still limited. The students involved in the study were all attending a Midwest, rural, state university. The study did not have a control group or randomized selection. The sample size was small for a research study (Creswell, 2014). The program is limited in number each semester which limited the number of students in the study. The expansion of the study to multiple universities that offer similar supports would improve the sampling population.

The data points incorporated in the study were effective, but future studies need to improve and expand to more standardized or formal measurements. The program evaluation created by the staff provides feedback and recommendations to the families at the end of each semester. Skills need to be measured separately, and the items on the program evaluation need to be adjusted prior to replicating the study. The Likert scale measurement was a starting point, but standardized measurements need to be the goal for future studies. In addition, incorporating pre- and post- measurements into the research study strengthens the results. The analysis of high school grade point average, formal test scores from the ACT or SAT, or the completion of a formal executive functioning test or questionnaire would have improved the study.

Additionally, future studies need to expand on the multiple measurements of success. The current study focused on grade point average, but college success can be measured in multiple ways. Adjustment, independence, social involvement, retention, grades, graduation, and employment can be measured for success (Accardo, 2017; Highlen, 2017; Knott & Taylor, 2013; Mitchell & Beresford, 2014; Toor, Hanley, & Hebron, 2016). The students with ASD receiving the supports or enrolled in programs need to be followed throughout college and adulthood to

fully understand and measure success. The goal of research related to this field of study is to improve the outcome data for students with ASD post high school while also studying patterns and precursors for success.

Overall, the outcomes of the study were expected. The additional, structured time a student with ASD incorporated into school work during the guided study tables resulted in an improved grade point average for the semester. The linear regression analysis resulted in a linear equation for predicting the needed number of guided study tables,  $\text{Guided study tables hours} = 3.376 + (.552) \text{ desired grade point average}$ . Additional research is necessary to investigate this predictor equation. Facilitating and requiring participation in guided study tables in the transition to the college setting seemed to provide the support needed to establish the strategies, situation, self, and support outlined by Schlossberg's Transition Theory. The guided study tables did not directly impact all executive functioning skills, but the measurements incorporated resulted in independence with self-advocacy skills. The regular, frequent, weekly interaction possibly allowed students to practice and learn to speak or act on their own behalf in the new environment. The limitations of the study impact the generalization of the results. However, the study positively contributes to the limited field of study regarding college students with ASD.

### **Implication of the Results for Practice, Policy, and Theory**

Previous research indicated the need for additional supports for colleges students with ASD especially to assist with academic, social, executive functioning, and daily living skills (Cai & Richdale, 2016; Elias & White, 2018; Gelbar et al., 2015). Individual supports and comprehensive supports need to be investigated to determine the impact of the additional supports for the students with ASD. The current study revealed that guided study tables

incorporated into a comprehensive program is an effective support to consider in promoting grade point average and self-advocacy skills. Guided study tables could be an operative support integrated at the university setting with limited costs to the institution while providing regular direct contact with students.

Supports or programs need to be strategically established to ensure the needs of the students with ASD are being met. The planning and preparation for implementing supports will determine the success. Multiple areas need to be reviewed when considering implementing guided study tables within a university setting for students with ASD.

The guided study tables proved to be effective in this study possibly due to multiple factors. The fee-based component of the program ensured agreement and commitment to the program. The students utilized the supports available while parents were reinforcing the involvement in all required hours. The mentors overseeing the guided study tables participated in an in-service incorporating learning about ASD and expectations as a mentor. In addition, the mentors meet regularly with the director who has a strong background, training, and experience in ASD. Lastly, the impact of the other supports within the program was not accounted for in this study. Guided study tables were a positive support for the students enrolled in the comprehensive program. Therefore, caution needs to be used when generalizing the results outside of the current context of the study.

Previous research investigated the deficits of students with ASD to determine the need for additional support. Deficits have been identified in the areas of social communication, executive functioning skills, co-morbid conditions (i.e. anxiety, depression) which all impact retention and success in post-secondary education (Anderson et al., 2018; Grieve, Webne-Behrman, Couillou, & Sieben-Schneider, 2014). Transitions are also difficult for students with

ASD secondary to the need for routine and core characteristic of restrictive, repetitive behaviors (Hendrickson, Woods-Groves, Rodgers, & Datchuk, 2017; Pinder-Amaker, 2014). The different environment presents challenges because the routines and repetitive behaviors need to be established in the novel setting but specifically need to meet the expectations of the new setting.

Supports and programs need to address the multiple, unique characteristics of ASD. The theoretical and conceptual framework of the study provides a great starting point for universities to help students with ASD in the transition to the university setting. Scheduling guided study tables into the routine of college students with ASD in the transition to the college setting can possibly assist with establishing routines, reducing anxiety, and meeting the expectations of the new environment. Guided study tables support Schlossberg's transition theory and the need to cope with transition through the influence of situation, self, support, and strategies. Guided study tables can help in the transition while also establishing executive functioning skills in the academic setting. The conceptual framework of executive functioning skills are foundational skills needed in the transition to the college setting. Guided study tables should be further investigated at other institutions to research whether the support was unique to this environment or program while also determining the impact on students with ASD.

Deficits have been identified, and recent studies have explored the possible skills needed to ensure success for students with ASD. For example, this study investigated the executive functioning skills. Other studies have focused on self-advocacy skills (Highlen, 2017; Test et al., 2013), self-determination (Accardo, 2017; Hatfield et al., 2016), social skills and social integration (Ashbaugh et al., 2017; Jackson, Hart, Brown, & Volkmar, 2018), and problem solving skills (Jansen et al., 2017; Pugliese & White, 2014). In addition to these areas, students

with ASD might need to improve on transitioning, flexibility/adaptability, interpersonal skills, theory of mind, professional skills, accepting criticism, and goal setting.

The component frequently missing from the research involves the specific intervention or evidence-based practices that will improve the deficits or establish the skills needed for college students with ASD. The study is a starting point to help establish possible techniques and maybe future practices that will be effective for the students. Based on the unique characteristics of the students with ASD a hierarchy of supports or leveled services might need to be implemented in different semesters or years of attendance at the university to establish the skills necessary. The types of supports need to continue to be investigated.

Formal measurements and assessments are limited related to adults with ASD. In addition to establishing evidence-based practices for adults with ASD, professionals need to establish tests or scales relevant to college students with ASD. Studies seem to lack quantitative data due to this gap in formal, standardized measurements.

The research related to this topic and results of the study revealed students with ASD can be successful in college with additional supports. Previous research revealed the outcome data for students with ASD post high school was bleak (Migliore et al., 2012; Taylor & Seltzer, 2011). Students meet the requirements for receiving a high school diploma with the supports and accommodations provided by the Individualized Education Plan or 504 Plan as mandated by the IDEA law or Section 504. Transitional services and supports initiated in high school need to be explored to help students with ASD transition to the college setting (Barnhill, 2007; Chiang, Cheung, Hickson, Xiang, & Tsai, 2012; Wei, Wagner, Hudson, Yu, & Javitz, 2016).

Currently, higher education and employment supports are stipulated in the Americans with Disabilities Act. As evidence-based practices are investigated, policies and procedures also

need to be reviewed. Cox et al. (2017) calculated the increased number of students with ASD eligible for higher education over the next few years. Universities need to be prepared and in doing so, state and federal lawmakers need to consider supporting the students, families, and institutions.

### **Recommendations for Further Research**

The initial attempt for the novice researcher to investigate supports for college students with ASD provided a strong foundation for future studies. Design, methodology, and other delimitations are all areas to expand, extend, strengthen, and alter for future studies. The recommendations for future research will be reviewed and further discussed.

The quantitative research design incorporating both correlational research and descriptive data was effective for this research study. Future studies will hopefully extend to include other quantitative approaches such as quasi-experimental or experimental designs. Incorporating control or comparison groups into the study would be beneficial. Future research could compare the students receiving supports through the comprehensive program to either students with ASD at the university not enrolled in the comprehensive program or the general population of college students. The inclusion of pre- and post- measurements can provide a quasi-experimental design for additional analysis (Creswell, 2014). Specific to this study, baseline measurements of executive functioning skills and academics would provide the researcher with further data for comparison. Ideally, as the program continues at the university, a quantitative analysis program evaluation will also provide data for future planning for both the institution and the state and federal lawmakers.

Future research needs to continue to expand on the sample sizes, geographic location, and diversity of participants. The data from the one specific program at one university was

accessible to the researcher, but the implication of results is limited due to this small, select population. The data were collected from college students in a geographically-restricted region. The investigation needs to expand to other areas to determine the extent to which the supports and programs are truly meeting the needs of college students with ASD.

The participants in the study were enrolled in the full, comprehensive, transitional program. Other students with ASD were enrolled in a maintenance program but not included in this specific study. Therefore, future studies need to incorporate a support that all students in the program receive to sample the entire group. Guided study tables provided a strong variable to analyze due to the multiple hours of participation, but the other components of the program need to be incorporated in future studies.

When considering the benefits of guided study tables as a support for students with ASD, additional research is needed. Previous research varies in terms of the improvement of grades when compared to the number of study hours (Nonis et al., 2007; Plant et al., 2005). Even though the study indicated a positive correlation between guided study tables and semester grades, the strategies and techniques incorporated into the study tables benefitting the students with ASD need to be analyzed and identified. Further investigation could also compare the necessary academic skills needed at the college level compared to high school. The study habits, study skills, and experiences from high school would all impact the student's active participation of guided study tables at the college level.

Besides the effective components of the guided study tables, the relationship between hours in guided study tables and academic success needs to be investigated. The study provided an equation for predicting the number of guided study table hours needed as a starting point for future research and investigation. The program currently requires six hours, however the average

number of guided study tables attended by the students with ASD was 5.03 hours (range 1.88-9.33). The number of hours required might need to be reviewed by staff to determine what is deemed appropriate or necessary. Individual students might need varying number of required hours depending on precursor skills from high school, the desired level of success at the university, or other formal measurements not incorporated into studies yet.

The measurements selected in the study involved both grade point average and the development of executive functioning skills. Since ASD is a complex disability with unique characteristics for each individual, studies need to continue to expand on both academic and non-academic skills (Kuder & Accardo, 2018). The need for more formal and standardized measurements should also be incorporated into future studies. Combining multiple measures into the study can also strengthen future studies. The success of the programs and supports depend on the students enrolled, families willing to participate, and institutions willing to offer additional support, and faculty/staff willing to contribute. Therefore, data from all stakeholders regarding the supports and programs should be included in future studies.

The current study was able to utilize four semesters of data points for analysis resulting in the positive correlation between participation in guided study tables and semester grade point average and a negative correlation in the participation in guided study tables and the Likert scale on the program evaluation related to independence and self-advocacy at the university level. Students who participated in a greater number of guided study table hours achieved stronger academic success and demonstrated self-advocacy skills on the college campus. The study confirmed the need for additional longitudinal studies. ASD is a developmental disorder, and students will develop the skills necessary over time. Success needs to be measured over an extended period of time especially for students with ASD.

The study was one of the few studies focusing on specific supports and intervention to support college students with ASD. Further investigation of evidence-based practices are needed while also exploring the skills needed, the factors contributing to success and obstacles even when supports are in place, and the data from the programs. Administration wants to know if the programs are achieving the goals outlined to be cost-effective to continue. Parents and students want outcome data to determine if the student should attend the institution compared to others. Faculty and support staff need in-services and training to know how to best support the student at the university, and students want to be successful. Research needs to extend to all areas to fully consider the success of the supports and programs.

## **Conclusion**

The investigation was conducted to examine a specific support for college students with ASD enrolled in a comprehensive, transitional program in college. The first research question focused on determining if there was a relationship between the required support of guided study tables and academic success measured through semester grade point average. The second research question studied the relationship between guided study tables and the independence implementation of executive functioning skills.

The quantitative research design consisted of a correlational research and descriptive survey. The data was obtained from one university implementing a fee-based transitional program for students diagnosed with ASD entering post-secondary education. The participants were college students accepted to the university based on their own merit, disclosed the disability to student disability services, and applied for enrollment into the fee-based, comprehensive program. The director of the program provided four semesters of anonymous data including average weekly number of guided study tables, semester grade point average, and the program

evaluation ratings related to executive functioning skills for each student. The descriptive survey provided demographic information of current and past students enrolled in the university program.

The results contribute to the limited research on programs and supports for college students with ASD. Besides classroom accommodations, college students with ASD need additional supports to address the unique characteristics associated with the diagnosis of ASD. Jansen, Petry, Ceulemans, Noens, and Baeyen (2017) characterized the functional and participation challenges into the categories of social interaction and communication, inefficient study skills, and coping skills and behaviors. Whereas, White et al. (2016) identified the overarching needs associated with social integration, self-determination, and self-regulation. Similarly, Van Hees, Moyson, and Roeyers (2015) classified the challenges for college students with ASD to be transitioning to the new setting, establishing the necessary social contacts, processing information and time management, and mental health issues. Transitional supports and executive functioning skills analyzed in the current study contributes to the growing research on colleges students with ASD. The supports and programs being implemented to promote success in post-secondary education need further analysis to determine the impact on academic and non-academic success of individuals with ASD while also determining the skills necessary to improve the outcome data post high school for students with ASD.

The results of the study revealed that guided study tables yielded positive results for the students with ASD enrolled in the program. Multiple linear regression analysis demonstrated a positive significant relationship between guided study tables and semester grade point average. Time management, flexibility, and self-awareness skills did not prove to have a significance

relationship to participation in guided study tables. However, a relationship existed between the participation in guided study tables and overall independence and self-advocacy.

Utilizing four semesters of data from the program was a unique component of the study while also proving to be important. Incorporating more and different students resulted in the significant relationships being established. Guided study tables proved to be an effective and original support never analyzed in previous studies. However, future research needs to continue to expand on this initial idea.

Further research needs to investigate the individual components associated with guided study tables at this university. Implementation of this support was well-planned, organized, and reinforced. Planning consists of scheduling hours that meet the demands of the students and structuring the hours into the student's schedules. Regular attendance and participation were required through the formal agreement and commitment upon initial enrollment into the program. Orientation and training of the mentors overseeing the guided study tables occurred with regular, frequent follow-up throughout the semester to reinforce the target skills attempting to be established for the students with ASD. Therefore, active participation of the students and mentors might influence the impact of the guided study tables and need further research.

Individuals with ASD present unique challenges that need to be supported throughout life. The implementation of early identification, early intervention, early childhood education, and inclusive education now requires post-secondary education to consider services to support students with ASD in the college setting. The future can be bright for those with ASD with continued awareness, research, and innovation.

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## Appendix A: Demographic Information Survey

(Please select your responses or answer the question)

1. I wish to participate in this study.  
Yes                      No
2. I have been diagnosed with an Autism Spectrum Disorder (i.e. autism, high functioning autism, Asperger's Syndrome, Pervasive Developmental Disorder, PDD-NOS).  
Yes                      No
3. By checking this box, I certify that I am at least 18 years old.  
Yes                      No
4. Age: \_\_\_\_\_
5. Sex (circle one):  
Male                      Female
6. Race/Ethnicity:  
Caucasian/white  
  
African American  
  
Asian  
  
Hispanic/Latino  
  
Other: \_\_\_\_\_
7. I have been enrolled at other institutions of higher education.  
Yes                      No
8. Current declared major/minor:  
  
Major: \_\_\_\_\_  
  
Minor: \_\_\_\_\_
9. Current class standing:  
Freshman      Sophomore                      Junior                      Senior                      Graduate Student

10. Current academic status:

Good standing      academic probation      academic warning

11. Accommodations in the classroom (circle all that apply):

Note Taker

Extended deadlines

Extra time on tests

Alternate testing site

Course Substitution/waiver (e.g. in math, foreign language)

Preferential Seating

Other

12. Have you been previously or currently gainfully employed (minimum 5 hours/week)?

Yes      No

13. Student Residency:

Resident Hall      on-campus apartment      parent's home      other

14. Do you have a roommate while living on campus?

Yes      No

15. Parent's annual household income:

<\$25,000

\$25,001-\$50,000

\$50,001-\$75,000

\$75,001-\$100,000

\$100,001-\$150,000

>\$151,000

Unknown

16. Maternal's education level (mother's highest level of education):

Some High School

Some College

Bachelor's Degree or higher

Unknown

17. Paternal's education level (father's higher level of education):

Some high school

Some college

Bachelor's Degree or higher

Unknown

18. Supports accessed while enrolled in classes/on campus:

Counseling center

Health Services

Writing Center

Student Success Center

Tutoring (departmental)

Career Counseling

Student Organization/Club

## **Appendix B: Consent for Anonymous Survey**

**The purpose of this study is to examine the relationship between participation in one specific support (guided study tables) in a comprehensive, transitional program for students with autism and the impact on academic success and/or the development of executive functions skills in the college setting.** The survey will provide descriptive data about the participants enrolled in the comprehensive, transitional program. We expect approximately 15-20 volunteers. No one will be paid to be in the study. We will begin enrollment on July 10, 2018 and end enrollment on December 31, 2018. To be in the study, you complete this online survey. Completing the survey should take less than 15 minutes of your time. The online survey is anonymous. We will not ask you any personal identifying information and we will have no record of who completes this survey.

The survey is one component of the research study. Additionally, three program data points will be collected anonymously for a qualitative, correlational study. Study tables hours, semester grade point average, and executive functioning performance on the program evaluation will be collected with the permission of the director, department chair, and university IRB.

**There are no risks** to participating in this study other than the everyday risk of your being on your computer as you take this survey. The benefit is your answers will help us gather information regarding the students with autism seeking out supports at the college level. There may be no direct benefit to you, however, by participating in this study, you may help us understand more about how to provide appropriate supports and accommodations for college-age students with autism.

**All data is collected anonymously.** If you were to write something that made it to where we predict that someone could possibly deduce your identity, we would not include this information in any publication or report. And data you provide would be held privately. All data will be destroyed three years after the study ends.

You can stop answering the questions in this online survey at any time.

Please print a copy of this for your records. If you have questions you can talk to or write the principal investigator, Rebecca Edgington. If you want to talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email [obranche@cu-portland.edu](mailto:obranche@cu-portland.edu) or call 503-493-6390).

**Click the button below to consent to take this survey.**

### **Appendix C: E-mail Recruitment letter**

You are invited to participate in this online research survey entitled “An investigation of executive functioning skills in college students with ASD participating in a transitional educational program”. You are included in this survey because you have identified yourself as an individual with autism as a member of the comprehensive, transitional program for students with autism. The number of subjects to be enrolled in the study will be 15-20.

The survey may take approximately 10 minutes to complete. Your participation is voluntary. If you do not wish to participate in this survey, do not respond to this online survey. Completing this survey indicates that you are voluntarily giving consent to participate in the survey. The purpose of this research study is to study a specific support offered through the comprehensive program and the relationship the support has to the development of executive functions skills in the college setting. There are no risks or discomforts associated with this survey. There may be no direct benefit to you, however, by participating in this study, you may help us understand more about how to provide appropriate supports and accommodations for college-age students with autism.

Your response will be kept confidential. We will store the data in a secure computer file and the file will be destroyed once the data has been published. Any part of the research that is published as part of this study will not include your individual information. If you have any questions about the survey, you can contact me (Rebecca Edgington), but you do not have to give your personal identification.

Thank you,

Rebecca Edgington  
Doctorate Candidate  
Concordia University–Portland

Please complete the checkbox below.

To participate in this survey, you must be 18 years or older. Place a check box here ☐

Completing this survey indicates that you are voluntarily giving consent to participate in the survey.

## Appendix D: STEP Evaluation Form

Student Name:

Date:

Key: 5 = Fully dependent/maximum assistance; 4 = Moderate support; 3=Minimal support; 2 = Monitoring; 1= Independent

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. Student demonstrates flexibility and self-awareness  | 5 | 4 | 3 | 2 | 1 |
| 2. Student is on time and regularly attends class   | 5 | 4 | 3 | 2 | 1 |
| 3. Student is independent in time management skills   | 5 | 4 | 3 | 2 | 1 |
| 4. Student organizes information and materials effectively                                    | 5 | 4 | 3 | 2 | 1 |
| 5. Student independently seeks out and participates in social opportunities on campus         | 5 | 4 | 3 | 2 | 1 |
| 6. Student participates in weekly mentor activities and monthly STEP activities               | 5 | 4 | 3 | 2 | 1 |
| 7. Student participates in weekly support group meetings                                      | 5 | 4 | 3 | 2 | 1 |
| 8. Student was prepared and utilized time effectively in study tables and one-on-one meetings | 5 | 4 | 3 | 2 | 1 |
| 9. Student is independent with activities of daily living skills                              | 5 | 4 | 3 | 2 | 1 |
| 10. Student manages stress and leisure effectively  | 5 | 4 | 3 | 2 | 1 |
| 11. Student's overall independence and self-advocacy at the university level                  | 5 | 4 | 3 | 2 | 1 |

Grades:

Semester/ Cumulative GPA:

Academic Standing:

Comments:

## **Appendix E: Statement of Original Work**

The Concordia University Doctorate of Education Program is a collaborative community of scholar-practitioners, who seek to transform society by pursuing ethically-informed, rigorously- researched, inquiry-based projects that benefit professional, institutional, and local educational contexts. Each member of the community affirms throughout their program of study, adherence to the principles and standards outlined in the Concordia University Academic Integrity Policy. This policy states the following:

### **Statement of academic integrity.**

As a member of the Concordia University community, I will neither engage in fraudulent or unauthorized behaviors in the presentation and completion of my work, nor will I provide unauthorized assistance to others.

### **Explanations:**

#### ***What does “fraudulent” mean?***

“Fraudulent” work is any material submitted for evaluation that is falsely or improperly presented as one’s own. This includes, but is not limited to texts, graphics and other multi-media files appropriated from any source, including another individual, that are intentionally presented as all or part of a candidate’s final work without full and complete documentation.

#### ***What is “unauthorized” assistance?***

“Unauthorized assistance” refers to any support candidates solicit in the completion of their work, that has not been either explicitly specified as appropriate by the instructor, or any assistance that is understood in the class context as inappropriate. This can include, but is not limited to:

- Use of unauthorized notes or another’s work during an online test
- Use of unauthorized notes or personal assistance in an online exam setting
- Inappropriate collaboration in preparation and/or completion of a project
- Unauthorized solicitation of professional resources for the completion of

the work.

### Statement of Original Work (Continued)

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University–Portland Academic Integrity Policy during the development and writing of this dissertation.
2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association*

Rebecca Edgington

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Digital Signature

Rebecca Edgington

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Name (Typed)

January 30, 2019

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Date