THE RELATIONSHIP BETWEEN PSYCHOSOCIAL DEVELOPMENT AND THE BROADER AUTISM PHENOTYPE IN COLLEGE STUDENTS

by

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(Under the Direction of Diane L. Cooper)

ABSTRACT

This exploratory research study surveyed students between the ages of 18 and 25 enrolled in an introductory psychology course at a large, public institution in the Southeast. The study explored the psychosocial development of students with the Broader Autism Phenotype (BAP), and it serves as a foundation for understanding students with the BAP. Three research questions guided this study: (1) what are the demographic characteristics of students with the BAP? (2) is there a difference between the psychosocial development, as measured by the *Student Developmental Task and Lifestyle Assessment* (SDTLA) subtasks, of students with the BAP and neurotypical students? and (3) is there a relationship between the subscale scores on the *Autism-Spectrum Quotient* (AQ) (social skills, attention switching, attention to detail, communication, and imagination) and the students' psychosocial development as measured by the SDTLA subtasks (emotional autonomy, interdependence, and peer relationships)?

The study had several limitations including the sample size of students with the BAP, little variation in class representation, and scale reliability. Analyses of data

collected showed a statistically significant difference between neurotypical students and those with the BAP in emotional autonomy, peer relationships, and interdependence. Furthermore, there was a relationship between the students' scores on emotional autonomy and attention to detail, as well as relationships between imagination and the three subtasks of emotional autonomy, interdependence, and peer relationships. This study was investigative in nature and added to the growing literature on students with the BAP. Implications for practice from the study results include enhanced training for educators on characteristics of BAP students and early interventions in their college experiences.

INDEX WORDS: Broader Autism Phenotype; Psychosocial Development; College Students; Student Developmental Task and Lifestyle Assessment; Autism-Spectrum Quotient

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DEDICATION

This dissertation is dedicated to my sister Laurie (1968-2014). She influenced what I consider to be my core attributes. She taught me the importance of kindness and the value of wholehearted laughter. Most of all, I learned to embrace and celebrate difference. She was passionate about disability-related issues and was an advocate for others. My sister encountered many obstacles due to her disability, but she was not defined by them. This is dedicated to everyone who has a "gray area" identity.

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I took a gravel road to completion, which included many dead ends and obstacles. It sometimes felt like I was at the bus station when I really needed to take the boat. My dedication never wavered, but the way was sometimes unclear and difficult to find. Without so many amazing individuals in my life, I might still be on the journey.

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Towards the end of my journey I discovered Crossfit, and it made a difference in my life in ways I would never have imagined. There were so many parallels between my Crossfit experience and my dissertation journey. It taught me to believe in my abilities

and to try even when things seem impossible, and it reminded me that we are all on our own journey and that the turtle still always finishes.

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CHAPTER 1

INTRODUCTION

Context for the Study

In the last several decades, college campuses have seen a growing number of students who are female, adult, first-generation, veteran, multicultural, part-time, and disadvantaged. This population includes students with disabilities whose enrollment has increased since the passage of the Americans with Disabilities Act (ADA, 1990). In the 2007-2008 academic year, students with disabilities made up 10.9% of the undergraduate population at postsecondary institutions in the United States (NCES, 2013). In order to qualify as having a disability, institutions of higher education require recent and thorough documentation from a qualified health professional. Once documentation is received, students are entitled to accommodations necessary to ensure equal access (Wisbey & Kalivoda, 2011). Over the past decade, students with Autism Spectrum Disorders, often known as Asperger Syndrome and Autism, started arriving on college campuses at an increased frequency (VanBergeijk, Klin, & Volkmar, 2008; Wolf, Brown, & Bork, 2009)

The *Diagnostic and Statistical Manual of Mental Disorders (DSM-V)* (2013), published by the American Psychiatric Association, provides a common language and standard criteria for the classification and diagnosis of mental disorders. Clinicians, researchers, pharmaceutical companies, health insurance providers, and policy makers use the DSM-V to determine one's eligibility for services. Both Asperger Syndrome and Autism were included in the DSM-IV (2000); however, these were combined in the

DSM-V (2013) and entitled Autism Spectrum Disorder (ASD). The criteria provide information to help clinicians determine whether or not an individual is on the Autism Spectrum. The criteria are listed below in Table 1. An individual with the Broader Autism Phenotype, to be defined in the next section, embodies some or many of these criteria; however, s/he does not meet the minimum requirement of manifestations listed in the DSM-V. Students with Autism Spectrum Disorders are able to make that threshold of documentation in order to receive accommodations.

Table 1

DSM-V Diagnostic Criteria 299.00 (F84.0) Autistic Spectrum Disorder (APA, 2013, p.50)

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):
    1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interest, emotions, or affect; to failure to initiate or respond to social interactions.
    2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
    3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

    Specify current severity:

    Severity is based on social communication impairments and restricted, repetitive patterns of behavior (see table 2)

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):
    1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypes, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g. apparent indifference to pain/temperature, adverse response to specific sound or textures, excessive smelling or touching of objects, visual fascination with lights or movement.

Specify current severity:

Severity is based on social communication impairments and restricted, repetitive patterns of behavior (see table 2)

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Note: Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Table 2

DSM-V Severity levels for Autism Spectrum Disorder (APA, 2013, p.52)

Severity level	**Social communication**	**Restricted, repetitive behaviors**
Level 3 "Requiring very substantial support"	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.	Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.
Level 2 "Requiring substantial support"	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.	Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
Level 1 "Requiring support"	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-for conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.	Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

Many researchers believe that all seemingly related disorders, including Autism, High-Functioning Autism, and Asperger Syndrome, are part of Autism Spectrum Disorders (ASD) (Gillberg, 2002; Mesibov, Shea, & Adams, 2001). The Broader Autism Phenotype (BAP) derives from the spectrum model of Autism and refers to a set of subclinical traits and symptoms associated with ASD (Jobe & White, 2007; Micali, Chakrabarti, & Fombonne, 2004). Specifically, the BAP refers to adults in the general population with normal intelligence who exhibit traits found on the Autism Spectrum, including social, communication, and language difficulties (Baron-Cohen et al., 2001; Jobe & White). "Following the spectrum model of autism, there is considerable evidence for a broader autism phenotype, or a set of subclinical personality traits and symptoms associated with ASD, observable in relatives of individuals with spectrum disorders as well as in the general population" (Jobe & White, p. 1480). In other words, the BAP describes individuals with mild autistic-like traits. They may demonstrate some of the diagnostic criteria, but generally to a lesser degree than those on the autism spectrum. The following figure demonstrates the difference between Autism Spectrum Disorders and the BAP.

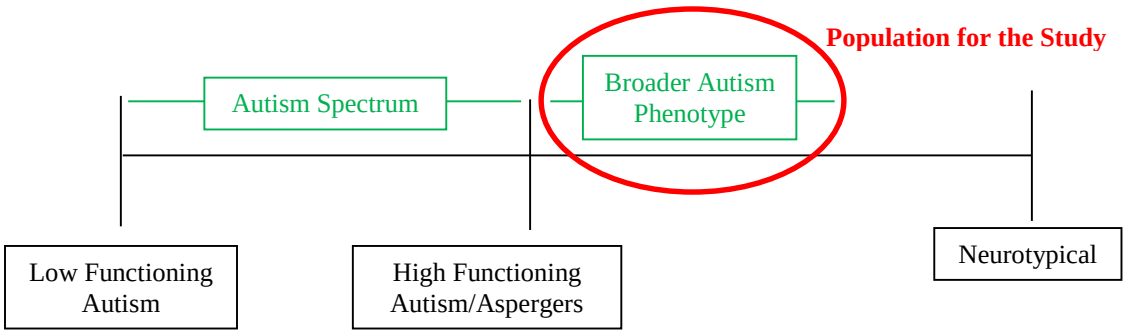

Figure 1: Visual Representation of Cognitive Functioning

While these individuals have similarities to those with Autism Spectrum Disorders, they do not have a medical diagnosis. Without this documented disability, they cannot receive accommodations or additional assistance regardless of their areas of difficulty.

Broader Autism Phenotype

The following descriptions of students Frank and Suzy serve to illustrate how students with the Broader Autism Phenotype (BAP) may experience college. Frank is a first-year student who lives in a residence hall at his college. He spends a lot of time with his roommate Michael, and they get along very well. Michael has recently met some new friends and wants to introduce Frank, so he can be part of the group. Frank agrees, but finds that he is not comfortable with this larger group of friends. He struggles to find a place in the conversations and wishes he was just hanging out with Michael. Furthermore, Frank tries to discourage Michael from spending time with his new friends and is angry when Michael does so. Michael, however, does not understand why Frank is upset and becomes frustrated, and Frank does not understand why Michael needs other friends.

Suzy has been at her university for three years. For the first two years she tried to live with roommates, but struggled in finding someone who shared her living style. Suzy is very detail-oriented and notices everything. She would often talk to her roommates when she noticed things out of place. She even went so far as to put things back where she thought they belonged, even if they were not her property. In addition, Suzy did not like having visitors in the room because it often disrupted the space. Because she continued to engage in conflicts, Suzy and her family finally determined that it was best if she lived alone.

Suzy and Frank are both students who may be described as having characteristics of the BAP, defined as someone with mild autistic-like traits in the typical population. For the most part, they integrate and succeed in college, especially in academics. However, they have a few characteristics that provide obstacles for them. Frank struggles with large group socialization, and Suzy does not function well in what she considers to be chaos and disorganization.

This research study was designed to explore how students like Suzy and Frank develop psychosocially in college. Suzy and Frank are students with characteristics of the BAP, a growing population of students in higher education that very few faculty and staff clearly understand (Wolf, Brown, & Bork, 2009). Therefore, the following section introduces background information and terminology that will be useful to better comprehend the nature of this study.

Operational Definitions

To provide better understanding of the various aspects of the literature and overall purpose of this study, several terms require introduction and definition. The following definitions guided the research and provided a foundation for the study:

Autism Spectrum Disorders (ASD)

Autism Spectrum Disorders are a group of life-long developmental disabilities defined by patterns of unusual social interaction, communication, and behaviors/interests. ASD includes autism, pervasive developmental disorder (not otherwise specified), and Asperger Syndrome (CDC, 2011).

Autism

Autism is characterized by problems with social, emotional, and communication skills. The inability to function in these areas ranges from mild to severe. Individuals with autism may have different ways of learning, paying attention, or reacting to objects and situations (CDC, 2011).

Asperger Syndrome (AS)

Asperger Syndrome is also characterized by social, emotional, and communication skill difficulties. Individuals with Asperger Syndrome do not experience language delays and tend to have higher or above average IQ (CDC, 2011).

Broader Autism Phenotype (BAP)

Broader Autism Phenotype describes individuals with mild autistic-like traits in the typical population. Individuals with the BAP may demonstrate some of the diagnostic criteria, but to a lesser degree (Baron-Cohen, et al., 2001).

Neurotypical

This is a term generally used in the autism community to describe an individual who is not part of the autism spectrum and who does not have any type of atypical neurology. A neurotypical is someone who does not have any characteristics consistent with Austim Spectrum Disorders (Attwood, 1998; Cashin, 2006). This is essentially the same terminology as using the term "normal."

Theory of Mind

Theory of Mind refers to the ability to understand other's mental states, including beliefs, desires, pretending, motivations, and intent. This includes recognition that others

have emotions that are different from one's own (Colle, Baron-Cohen, Wheelwright & van der Lely, 2008; Gerdts & Bernier, 2011).

Purpose of the Study

The purpose of this study is to explore the psychosocial development of college students with the Broader Autism Phenotype (BAP). This research is particularly important because it provides information about students who may have autism traits, but are not diagnosed or within the autism spectrum. These students may have difficulties in the areas of social skill, attention switching, attention to detail, communication, and/or imagination. If educators and administrators are able to understand how these characteristics impact BAP students' psychosocial development, institutions of higher education will be better able to provide the support these students need in order to be successful in college.

Research Questions

To better understand the relationship between the BAP and psychosocial development for college students, the following research questions were devised to guide this study:

RQ1: What are the demographic characteristics of student with characteristics of the Broader Autism Phenotype?

RQ2: Is there a difference between the psychosocial development, as measured the *Student Developmental Task and Lifestyle Assessment* (SDTLA) subtasks, of students with the Broader Autism Phenotype and neurotypical students?

RQ3: Is there a relationship between the subscale scores on the *Autism-Spectrum Quotient* (Social skills, Attention switching, Attention to detail, Communication, and

Imagination) and the students' psychosocial development as measured by the *Student Developmental Task and Lifestyle Assessment* subtasks (Peer relationships, Emotional Autonomy, and Interdependence)?

Theoretical Framework

Psychosocial theories of development examine the changes over time in the way individuals think, feel, behave, value, and relate to others. One of the most widely used theories of psychosocial development was the result of the work by Chickering (1969) and later revised by Chickering and Reisser (1993). This model recognized that students take many different directions and journeys through post-secondary education, but they eventually develop in similar areas, known as vectors. The seven vectors include developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity (Chickering & Reisser). Movement along the vectors is not linear or stage-like, but varied, allowing for growth on multiple vectors at the same time. "The vectors describe major highways for journeying toward individuation—the discovery and refinement of one's unique way of being—and also toward communion with other individuals and groups, including the larger national and global society" (Chickering & Reisser, p. 35).

Chickering and Reisser's (1993) seven vectors deal with feelings, thinking, believing, and relating to others. As previously explained, individuals with an Autism Spectrum Disorder often struggle within these areas of their lives. The work by Chickering and Reisser characterized development in individuals who are seen as neurotypical by those in the autism community. This theory of identity development

purports to describe student development during the college years. According to Ryan and McCarthy (1994), "In the population of students with disabilities, evidence suggests that those with visual or hearing impairments and learning disabilities may differ in psychosocial development from others in the subpopulation because of disability-specific environmental responses to their disability" (p. 20). Given this, students with disabilities may differ in their overall psychosocial development. Yet there is little to no published research exploring the psychosocial development of students on the autism spectrum and/or with the Broader Autism Phenotype. Chickering and Reisser's model can help in developing greater understanding of the psychosocial development of students, including those with the BAP.

Significance of the Study

For students with the Broader Autism Phenotype, an additional challenge is that they do not have a diagnosed disability and therefore are not eligible for additional educational assistance. However, these individuals exhibit characteristics from the Autism Spectrum that may inhibit their ability to function successfully at the post-secondary level. Jobe and White (2007) found that non-diagnosed college-age students needed additional assistance in areas such as friendship maintenance and social communication. Without understanding how students with the Broader Autism Phenotype develop psychosocially and to what level they embody traits from the Autism Spectrum, it is impossible to appropriately provide services for these students.

During the K-12 years, students with Asperger Syndrome and/or Autism participate in an IEP (Individualized Education Program) as mandated by the Individuals with Disabilities Education Act (IDEA) (2004). Each has his/her own individualized

plan, and teachers, parents, and school administrators work together to provide quality education for children with disabilities (IDEA). Once students reach post-secondary education, they are no longer required to receive an IEP. For students with Asperger's and/or Autism, this often disrupts the routine to which they have grown accustomed. Students have to self-disclose, register with the university's office that serves students with disabilities, and advocate for themselves in order to be eligible for accommodations within the classroom, which may be critical for the students' success (Adreon & Durocher, 2007; Morrison, Sansosti, & Hadley, 2009; VanBergeijk et al., 2008).

Because of the difficulties in areas of communication, social interactions, and executive functioning – an umbrella term for cognitive processes – many university disability services encounter students facing new challenges. According to Farrell (2004), the interpretations of what constitutes reasonable accommodations vary between institutions and challenge whether colleges/universities are responsible for teaching basic tasks. By contrast, VanBergeijk et al. (2008) suggested having an "'Individualized College Plan' [which] should outline academic modifications, independent living skills, socialization skills and goals, vocational goals, and mental health supports" (p. 1363). Morrison et al. (2009) stated that there is a need to provide meaningful support, so students with Asperger Syndrome and Autism have the opportunity to succeed in higher education. However, students with the Broader Autism Phenotype do not receive the same opportunities, as they do not qualify for the additional support due to the lack of an official diagnosis.

Hurlbutt and Chalmers (2002) stated simply that individuals with Asperger Syndrome need support in order to develop social skills. Professionals working with

these students should find ways to help them be successful in social interactions. Furthermore:

> The nature of autism spectrum disorders is a social disability and the failure by universities to provide social supports would substantially impair the student's ability to reach these goals. Furthermore, the failure to provide supports in the social realms for students with ASDs [Autism Spectrum Disorders] would exclude these students from being successful in academic achievement, which is a major life activity and the primary focus of universities. To be in compliance with the ADA, universities must learn to address the social and organizational difficulties of this population. (VanBergeijk et al., 2008, p. 1362)

Chapter Summary

Researchers need to investigate further how to identify and help individuals with characteristics of Autism Spectrum Disorder enhance their social functioning in the general population (Jobe & White, 2007). This study presupposes that in order to understand how to help individuals with the Broader Autism Phenotype (BAP), it is first important to understand how they develop psychosocially during post-secondary years. In addition, this study seeks to enhance the understanding of the extent to which students embody characteristics of Autism Spectrum Disorders, which would then indicate they have the BAP, and whether this influences their psychosocial development as compared to neurotypical students.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study is to explore the psychosocial development of college students who are characteristic with the Broader Autism Phenotype (BAP). Information found in the literature provides a framework for understanding the various aspects of this study. The following literature review is organized into several sections. The first section looks at Autism and Asperger Syndrome including their characteristics and history. The second section provides information related to legal issues pertaining to disabilities. In the third section, information about the BAP is provided. Finally, psychosocial development is discussed and an overview is provided.

Autism Spectrum Disorders

Leo Kanner first introduced the label "early infantile autism," known today as Autism, with an account of eleven children (eight boys and three girls) all under the age of eleven (Kanner, 1943). While Kanner found differences in the children's disturbances and manifestation of features, there were a number of characteristics consistent throughout the cases. Some of these fundamental components included an inability to relate themselves in the ordinary way to people and situations, positive relationships with objects, excellent rote memory, behavior governed by rigidity and consistency, and a profound desire for aloneness and sameness (Kanner, 1943).

Hans Asperger submitted his thesis in 1944 on the topic of autistic psychopathy, which Wing (1981) later coined as Asperger Syndrome. Asperger detailed four typical cases of autistic psychopathy in order to find the commonalities in the disorder. The

children were described as having limited abilities for social interactions, including eye contact and two-way communication, above average intellect, egocentricity, poor personal hygiene, and the ability to achieve success as adults (Asperger, 1944). Asperger noted, "The fundamental disorder of autistic individuals is the limitation of their social relationships" (p. 77). While Kanner and Asperger never met, they "independently described exactly the same type of disturbed child to whom nobody had paid much attention before and both used the label autistic" (Frith, 1991, p. 6).

Autism and Asperger Syndrome

Dating back to both Kanner and Asperger, there has been debate as to whether Asperger Syndrome is separate from Autism. Asperger acknowledged that there were many similarities between Asperger Syndrome and what Kanner called "early infantile autism" (Wing, 1981). According to Mesibov, Shea, and Adams (2001), "there is no professional consensus as to whether differences between AS [Asperger Syndrome] and HFA [High-functioning Autism] are significant enough to justify the use of two diagnostic labels" (p. 36). According to the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition* (DSM-IV) (2000), Asperger Syndrome and Autism were classified as separate diagnoses. However, the *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition* (DSM-V) (2013) combined these into Autism Spectrum Disorder (ASD). Part of the rationale included the lack of substantial differences between Asperger Syndrome (AS) and High-Functioning Autism (HFA), as well as an inconsistency in the diagnoses applied by different clinics and treatment centers (American Psychiatric Association, 2013).

While Autism and Asperger Syndrome have only recently existed as one diagnostic category, the similarities between the two have been evident for some time. The severity in the manifestation of characteristics, as well as the impact on daily life, has often been what differentiates the disorders. In common, they share what is generally referred to as "the triad", which consists of problems affecting social interaction, communication and imagination, and repetitive and restricted patterns of behavior (Frith, 1991; Gillberg, 2002; Tantam, 2000; Wing, 1996).

Social interactions. There are various characteristics described for the manner in which impairments of social interactions manifest. The most common type is described as the *aloof group* (Wing, 1996). Individuals in this group tend to behave as though others do not exist; they do not come when called, respond when spoken to, or really show any type of facial expression.

The next group of individuals is the *active but odd group*; they make approaches to others, but communication is generally one-sided (Wing, 1996). For example, an individual in this group may go on and on about their own concerns without paying attention to the needs of the other in the conversation. "This group tends to present particular problems of diagnosis because the active social approaches cover up the fact that they have no real understanding of how to interact socially with other people" (Wing, p. 37).

The final group is generally seen later in adolescence or adult life. Described as the *over-formal, stilted group*, these individuals tend to have a good level of language and will engage with others, but are very formal in their behavior (Wing, 1996). They will continually try to behave according to the rules, as they understand them. Sarcasm and

jokes will provide challenges for this group as the individuals may have difficulty adapting to the subtle differences in conversation.

Communication and imagination. Wing (1996) described the communication and imagination aspect of the triad with the statement, "The problem lies with the way they use whatever language they do have" (p. 38). In this category, there is the way they use speech and understand speech, their intonation and voice control, and, finally, their level of using and understanding non-verbal communication (Wing). Some children on the lower end of the spectrum never speak, but most develop some type of speech ability, which may include good grammar and a large vocabulary. Individuals described as high-functioning develop somewhat normal speech and are not as affected by delays as children. Some will speak very little while others will talk at length and provide more detail than necessary. "Some adults have learned that such repetitive talking is not socially acceptable and try not to do it, but given the slightest opportunity, they cannot resist returning to their [favorite] themes" (Wing, p. 40).

Communication patterns vary as well as intonation and voice control. Some individuals on the spectrum may be overly loud, others too quiet, and some robotic and without tone inflection. One of the most common areas of struggle is non-verbal communication. Recognizing someone's thoughts or feelings using facial cues or other behaviors can be very difficult for individuals on the spectrum. One study by McCrimmon, Schwean, Saklofske, Montgomery, and Brady (2012) found that individuals with Asperger Syndrome preferred verbal tasks to visual ones. Rutherford, Baron-Cohen, and Wheelwright (2002) also found that individuals with AS/HFA had difficulties drawing theory of mind inferences. This study was replicated in 2007, and

the duplicated study found that intonation and verbal content did not help individuals on the Autism Spectrum recognize complex emotions and mental states (Golan, Baron-Cohen, Hill, & Rutherford, 2007).

A major characteristic associated with communication patterns is understanding language; the most difficult of which is emphatically literal interpretations (Wing, 1996). For example, the saying "take a seat" may prompt an individual on the spectrum to actually pick up the seat and take it. As higher-functioning individuals age, they will make fewer mistakes in their interpretations, but will still sometimes be caught by simple, everyday phrases.

Repetitive and restricted patterns of behavior. Individuals with ASD may have repetitive behaviors or motions that can involve part of the body, the entire body, or objects (Pierangelo & Guiliani, 2008; Tantum, 1991). Furthermore, disruptions in patterns or routines may cause a tantrum or other acting-out behaviors. Some of these routines may seem unusual to others, including looking in every window they pass, flapping their arms, walking on their toes, and lining things in a certain way. Sometimes the repetitive behavior takes the form of a persistent preoccupation with a certain topic, such as learning about vacuum cleaners, train schedules, science topics, or movie genres. Wing (1996) stated:

> This aspect of autistic [behavior] makes most sense if seen as the other side of the coin of impairment of imagination. If the person with autism cannot enjoy the activities that involve flexible, creating thinking, cannot enjoy exchanging ideas with other people, has no understanding of or interest in other people and cannot integrate past and present experiences to make plans for the future, the only thing

> left is the reassurance of repeating those activities that do give some pleasure. (p. 45)

If something in a routine changes, it can cause frustration and sometimes fury for someone with ASD; for example, a television show changing time or being cancelled could prompt a reaction (Tantum, 2000). An individual with ASD may signal interest in a particular topic with memorization of facts and information and the desire to share this with others.

Social Skills and Social Interactions

Although persons with AS/HFA are generally interested in having friendship and social encounters, they have difficulty keeping up with the norms and cues necessary for such interactions to occur (Mesibov, Shea & Adams, 2001). Despite some who constantly make an effort to socially integrate, they may never actually achieve such integration due to their struggles with social norms (Frith, 1991), including lack of eye contact, facial expressions, and two-way communication (Asperger, 1991; Gillberg, 2002). When people with Asperger's continually struggle with social interactions and because they are unable to infer meanings from tone or context, some just shut down (Farrell, 2004). For example,

> Eugene has struggled his whole life with trying to interact appropriately with others. As he says, 'there are these social skills that foul me up!' His frustration with not being able to 'read the body language and social cues of others, like neurotypicals do,' particularly in regard to his relationships with women, is readily apparent. He struggles to understand the difference between romance and

> friendship, which he expressed to us in our conversation several times. (Hurlbutt & Chalmers, 2002, p. 105)

Children with AS/HFA can be considered egocentric in that they are following their own desires, needs, interests, and impulses without considering others (Asperger, 1944). Some individuals improve with practice, but others do not.

One of the misunderstandings about AS/HFA is that the individuals are unfeeling. In the majority of cases, they do have emotions, but the problem lies in their failure to express their feelings in appropriate and/or meaningful ways (Gillberg, 2002). In addition, while some individuals with AS/HFA are not interested in social interactions, the majority of them want to develop friendships and romantic relationships (Adreon & Durocher, 2007; Jones & Meldal, 2001). In a study by Jones and Meldal, individuals with Asperger Syndrome found the Internet to be a means to develop and maintain social relationships, and that interacting with others who have AS was a source of social and emotional support. Adults with AS/HFA will generally have the intellectual capacity for employment, but the difficulty remains in their inability to master social cues (VanBergeijk et al., 2008). According to Roe (1999), there is a societal expectation that people know how to handle social situations. Gillberg (2002) suggested that instead of concentrating on social difficulties, individuals must focus on their intellectual capacities, therefore focusing on increasing self-confidence.

Legal Issues

Several federal laws associated with individuals with disabilities and their rights provide legal direction for educators and administrators in higher education. According to the U.S. federal government, in order to be protected by disability laws, an individual

must be determined to "(1) have a physical or mental impairment that substantially limits one or more major life activities; or (2) have a record of such an impairment; or (3) be regarded as having such an impairment" (ADA, 1990). While individuals with the Broader Autism Phenotype are not diagnosed through DSM-V criteria, it can be argued that they meet the conditions above and may be protected by disability laws. However, there is a marked difference between the laws governing elementary and secondary education (K-12) and those for higher education, and it is essential to understand these distinctions.

In K-12 settings, educational institutions initiate accommodations, requiring parents and teachers to step in and assist students. In postsecondary or higher education, however, the responsibility lies with the students to request accommodations and provide necessary documentation to support their needs (Dente & Coles, 2012). The accommodations to meet needs during the K-12 years may not be available to students in postsecondary education, which often provides a challenge to students transitioning to higher education (Wisbey & Kalivoda, 2011). Dentes and Coles (2012) used the table below to describe the differences between high school and college.

Table 3

High School and College Differences (Dente & Coles, 2012, p. 29)

High School	College/University
Structured	Unstructured
School/parents direct disability needs	Student directs disability needs
School obliged to meet most needs	"Reasonable" accommodations provided
IEP outlines accommodations	Documentation outlines accommodations
High parental involvement	Limited parental involvement

Frequent school-parent communication	Limited/no school-parent communication
High teacher involvement/responsibility	High student involvement/responsibility
May provide attendants and tutors	Not required to provide attendants and tutors (unless provided for all students)

Section 504

Section 504 of the Rehabilitation Act of 1973 mandated that postsecondary education provide access for students with disabilities. It specifically provides protection from discrimination in federally funded programs and activities. Individuals with disabilities must have access to program benefits and services. Section 504 requires that school districts provide a free appropriate public education to qualified individuals who have a physical or mental impairment that substantially limits one or more life activities. Physical and mental impairments include, but are not limited to, any physiological disorder or condition, mental or psychological disorder, emotional or mental illness, and specific learning disabilities. Furthermore, examples of life activities include, but are not limited to, eating, sleeping, reading, concentrating, thinking, and communicating.

Americans with Disabilities Act

The Americans with Disabilities Act (ADA) of 1990 prohibits discrimination on the basis of disability in employment, state and local government, public accommodations, commercial facilities, transportation, and telecommunications. According to the ADA, one must have a disability or have a relationship or association with an individual with a disability in order to be protected by this act. The ADA does not specifically name all the impairments covered by the law.

The ADA Amendments Act (ADAAA) became effective on January 1, 2009 and focuses on the discrimination rather than the individual's disability. The basic definition

of disability remains, but the way that the statutory terms should be interpreted has changed. For example, "major life activities" like reading, thinking, and communicating are now specifically recognized by the Equal Employment Opportunity Commission (EEOC). In addition, individuals covered only under the "regarded as having such an impairment" portion are not entitled to reasonable accommodations. Finally, the ADAAA emphasized that the definition of disability should be interpreted broadly.

Individuals with Disabilities Education Act

The Individuals with Disabilities Education Act (IDEA) (2004) requires public schools to ensure that all eligible children have access to a free education with the least restrictive environment appropriate to an individual's specific needs. The IDEA requires public schools to provide each child with a diagnosed need an Individualized Education Program (IEP), which must outline specific special education and related services to reflect the individual needs of each child. The IDEA also maintains particular procedures in the development of a child's IEP. A team of knowledgeable persons must be developed and the IEP reviewed annually. The team includes the child's teacher, the parents (subject to certain limited exceptions); the child (if appropriate); an agency representative qualified in special education; and other individuals at the discretion of the parents and agency.

Family Educational Rights and Privacy Act

Official documents relating to students with disabilities are education records protected by the Family Educational Rights and Privacy Act (FERPA) (1974). Under FERPA, students can request to see their educational records. FERPA does not strictly prohibit parents of dependent students from accessing their educational records.

Institutions determine how they interpret and handle FERPA. Disability records contain sensitive and private information and must be maintained separately from other educational records. Many disability offices require that students make and control all disability requests. In addition, because disability records are maintained separately from other educational records, campus personnel and parents must obtain written permission from the student to view those records (Wolf, Brown, & Bork, 2009).

Accommodations

During the K-12 years, students with Asperger Syndrome and/or Autism may participate in the IEP (Individualized Education Program) as mandated by the Individuals with Disabilities Education Act (IDEA). Each has his/her own individualized plan, and teachers, parents, and school administrators work together to provide quality education for children with disabilities (IDEA, 2004). Once students reach post-secondary education, federal law no longer requires them to receive an IEP. For students with Asperger Syndrome and/or Autism, the discontinuation of IEPs often disrupts the routine to which they have grown accustomed. In college, students have to self-disclose, register with the university's office that provides services to students with disabilities, and advocate for themselves in order to be eligible for accommodations within the classroom. These are actions that research has shown make a difference and can be critical for the students' success (Adreon & Durocher, 2007; Morrison et al., 2009; VanBergeijk et al., 2008).

Because of the difficulties in areas of communication, social interactions, and executive functioning skills, many students face new challenges in working with institution disability centers. According to Farrell (2004), the interpretation of what

constitutes "reasonable accommodations" varies among institutions and the researcher questions whether colleges/universities are responsible for teaching basic tasks. By contrast, VanBergeijk et al. (2008) suggested having an "'Individualized College Plan' [which] should outline academic modifications, independent living skills, socialization skills and goals, vocational goals, and mental health supports" (p. 1363). Morrison et al. (2009) articulated that there is a need to provide meaningful support in order for students with Asperger Syndrome and/or Autism to have the opportunity to succeed in higher education.

Hurlbutt and Chalmers (2002) stated simply that individuals with Asperger's need support in order to develop social skills; professionals working with them should find ways to help them be successful in social interactions. Without social supports, a student's ability to achieve academic and social success is significantly impaired. VanBergeijk et al. (2008) confirmed through their research that universities must address the social and organizational difficulties presented by these students in order to meet ADA requirements.

Transitions

College life can be a daunting experience for students with AS/HFA because of the changing schedules, social interactions, and overall understanding of the college environment (Glennon, 2001). "Without preparation students with ASDs would predictably fare far worse than neurotypical students in their transition to university" (VanBergeijk et al., 2008, p. 1362). In the higher education environment, students are responsible for self-advocacy in terms of legal protections, but they also face a need to self-initiate social interactions, which can be overwhelming in the midst of all the change

and the academic rigor (Dente & Coles, 2012). The independence associated with transitioning to secondary education is new for the typical student, but is actually foreign and in some ways impossible to conceive for some students with Asperger's (Glennon, 2001).

Research primarily has focused on the needs of students with AS/HFA in the K-12 environment, and only recently examined the needs of students with AS/HFA transitioning to college (Dente & Coles, 2012). The current information available relates primarily to the classroom. For example, helping students learn the differences in teaching methods and assignments [compared to K-12] is imperative to their overall success (Farrell, 2004; Hurlbutt & Chalmers, 2002). Furthermore, while developing social skills in K-12 is generally part of the IEP, at the higher education level actual participation in social activities should be strongly encouraged to help the students in their development (Dente & Coles).

Prizant (2009) found that trust is a key element to developing positive relationships with people on the autism spectrum. Furthermore, trust may actually provide a means for progress and growth. "With a history of difficulties in communication, and for some persons, stressful or even traumatic emotional memories of being ignored, misunderstood or even invalidated as a person, the casualty is trust; trust that other people 'get' them and respect them, and trust that the world is a safe place" (Prizant & Carley, 2009, p. 29). In order to foster trusting relationships with individuals with ASD, people must acknowledge communicative attempts; practice shared control; acknowledge emotional state and support emotional regulation; be dependable, reliable, and clear; be respectful in language and behavior; not overly intrude by using excessive

verbal and physical prompting; celebrate successes; anticipate what may be stressful and make appropriate modifications and accommodations to lessen stress (Prizant & Carley).

Broader Autism Phenotype

The Broader Autism Phenotype (BAP) describes individuals with mild autistic-like traits in the typical population. They may demonstrate some of the diagnostic criteria, but generally to a lesser degree. Essentially, the BAP is qualitatively similar to diagnosed Autism Spectrum Disorder (ASD) and is characterized by subclinical differences in social skills, social withdrawal, communication abilities, shyness, obsessive-compulsive traits, and rigid behaviors (Gerdts & Bernier, 2011; Gillberg, 2002). Studies have shown that there is a genetic connection between individual with BAP and relatives with diagnosed ASD (Wheelwright, Auyeung, Allison, & Baron-Cohen, 2010).

Research on the Broader Autism Phenotype

One of the major areas of study about the Broader Autism Phenotype has been on the relatives of those with Autism Spectrum Disorder (ASD). Several studies have found that relatives of autistic individuals exhibited characteristics similar to ASD, but at a much milder level (Bernier, Gerdts, Munson, Dawson, & Estes, 2012; Murphy et al., 2000; Piven et al., 1997; Scheeren & Stauder, 2008; Wheelwright et al., 2010; Whitehouse, Coon, Miller, Salisbury, & Bishop, 2010). These studies provide confirmation of the existence of the Broader Autism Phenotype.

One study examined the relationship between characteristics of the BAP and the ability to interpret nonverbal aspects of communication (Ingersoll, 2010). Using a non-clinical sample of college students, the study found that higher scores on the BAP

correlated with students' ability to recognize facial expressions, specifically negative expressions like disgust and sadness. Wainer, Ingersoll, and Hopwood (2011) also looked at a non-clinical sample of college students and found that the BAP was characterized by pragmatic language difficulties, social disinterest, and behavioral and cognitive rigidity.

Using a non-clinical sample of college students, Austin (2004) found that males and students in the hard sciences exhibited BAP characteristics more than females and students in other majors. There was also a high correlation between the scores on the Autism Spectrum Quotient (AQ), which measures the BAP, and high neuroticism and low extraversion. This study by Austin is one of the few that looked at personality traits and the BAP. Wakabayashi, Baron-Cohen, and Wheelwright (2006) also found that high scores on the AQ negatively correlated with extraversion and conscientiousness as well as positively with neuroticism. This study further confirmed the existence of the Broader Autism Phenotype and the effectiveness of using the AQ to identify it; the study suggested that further research look at the differences between the BAP and clinical groups (Wakabayashi et al.).

Jobe and White (2007) investigated a possible relationship between social functioning and the BAP. Using a sample of college students, they found that individuals who scored high on the Autism Spectrum Quotient (AQ) reported feeling significantly lonelier. The researchers concluded that those with the BAP do not necessarily prefer to be alone, but rather experience increased loneliness due to their lack of social skills. Wheelwright et al. (2006) found that one's score on the Empathy Quotient (EQ) and Systemizing Quotient-Revised (SQ-R) accurately predicted one's score on the AQ. This

indicated that the number of autistic traits individuals possessed was a function of their level of empathy and systemizing. Individuals who scored higher overall on the AQ also scored higher on systemizing and lower on empathy.

While research has explored the characteristics of the BAP, there is little to no research about the characteristics and actual behaviors of someone with BAP (Chen & Yoon, 2011). According to Rutter (2011), there is still a lack of understanding on how someone with the BAP fairs in adult life. Sasson, Nowlin, and Pinkham (2013) examined whether social-cognitive deficits, associated with the autism spectrum disorders extended to the general population. The findings showed that social BAP traits were associated with deficits in social cognition and reduced social skills. The findings in this study helped provide the researchers with more information to guide genetic and neural testing in non-clinical populations. The results support the current study by identifying the social deficits that exist in individuals with the BAP and suggest that further research is needed to understand how this relates to these students' development in college.

Psychosocial Development

The cornerstone of developmental theories is the process by which individuals think and behave. Psychosocial theories view individual development through the lens of completing tasks or stages, which vary with age and developmental status (Pascarella & Terenzini, 2005). The origination of psychosocial development theories dates back to Erik Erikson in the late 1950s. Erickson (1963) outlined stages of development that occurred beyond childhood and into adulthood and described how identity emerged from critical periods of development, which are shaped by one's environment. According to Pascarella and Terenzini, Arthur Chickering is the most influential researcher in

psychosocial theories. Chickering (1969) introduced a framework to synthesize developmental data about college students. He proposed seven vectors of development, which describe specific aspects of the concept of identity. Later, Chickering and Reisser (1993) adapted Chickering's vectors to create a new model of psychosocial development.

Chickering and Reisser

Chickering and Reisser's (1993) model of psychosocial development does not make the assumption that one challenge happens right after another nor that changes occur at any specific age. Rather, development is complex, and the seven vectors help us to understand where students are and where they are going. The seven vectors are: developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, and developing purpose. Movement along the vectors happens at different rates and sometimes occurs simultaneously. Chickering and Reisser asserted that, "while each person will drive differently, with varying vehicles and self-chosen detours, eventually all will move down these major routes" (p. 35). While the end goal is the same, the journey to get there is unique for the individual.

Developing competence. Developing competence focuses on three interrelated forms of competence – intellectual, physical and manual, and interpersonal (Chickering & Reisser, 1993). Intellectual competence focuses on the mind's abilities. This includes acquisition of subject matter, cultural and aesthetic appreciation, and cognitive thinking. Physical and manual competence involves athletic and artistic participation, healthy living, hands-on learning, self-expression, and creativity. Participating in quality dialogue is one of the foundations of interpersonal competence. Communication skills,

empathy, and collaboration with others also mark this competency area. While there are three components to developing competence, they come together to help students develop an overall sense of self and trust in one's abilities. The greater the sense of competence, the greater their readiness to learn, develop, take risks, persist, and try new things (Chickering & Reisser).

Managing emotions. When students come to college, they often have emotional baggage and an inability to control these emotions and/or appropriately express them (Chickering & Reisser, 1993). These feelings can often disrupt a student's ability to succeed as well as affect others in the campus community. Anxiety, fear, pain, and anger are several emotions that require appropriate management. "Development proceeds when students learn appropriate channels for releasing irritations before they explode, dealing with fears before they immobilize, and healing emotional wounds before they infect other relationships" (Chickering & Reisser, p. 46). In the end, emotional responses are healthy when managed appropriately; for example, some amount of anxiety can be positive, but when uncontrolled it can be debilitating (Chickering & Reisser).

Moving through autonomy toward interdependence. The three components of moving through autonomy toward interdependence are emotional independence, instrumental independence, and interdependence (Chickering & Reisser, 1993). Emotional independence begins when students separate themselves from their parents and ends when they learn how to rely on their own abilities and personal judgment. In addition, they no longer rely on peers or role models for approval. Instrumental independence involves student's learning how to make and carry out decisions on their own and a willingness to be mobile in order to accomplish goals. In other words,

students are able to be self-sufficient and literally willing to move to another location, whether that is for occupation or to find a better living situation. Interdependence allows students to redefine their relationship with their parents while maintaining independence. They develop a sense of place in the larger community and care about the welfare of society. Students realize that they can respect the autonomy of others and that relationships with friends are reciprocal and mutually beneficial (Chickering & Reisser).

Developing mature interpersonal relationships. Developing mature interpersonal relationships requires students to tolerate and appreciate differences as well as demonstrate a capacity for intimacy (Chickering & Reisser, 1993). Tolerance involves intercultural and interpersonal contexts. For students to develop their tolerance, they need to move past assumptions and learn about people and experiences they do not know. This creates openness, curiosity, increased empathy, and an interest in diversity. Quality of relationships, romantic and otherwise, is central to increasing capacity for intimacy. Students mastering this task show more vulnerability and make healthy relationships a priority with a focus on honesty, trust, and stability (Chickering & Reisser).

Establishing identity. The primary element of establishing identity is developing a solid sense of self. This is achieved by focusing on the following attributes: "(1) comfort with body and appearance, (2) comfort with gender and sexual orientation, (3) sense of self in a social, historical, and cultural context, (4) clarification of self-concept through roles and life-styles, (5) sense of self in response to feedback from valued others, (6) self-acceptance and self-esteem, and (7) personal stability and integration" (Chickering & Reisser, 1993, p. 181). Additionally, the previously noted vectors contribute to identity formation.

Developing purpose. "Developing purpose entails an increasing ability to be intentional, to assess interests and options, to clarify goals, to make plans, and to persist despite obstacles" (Chickering & Reisser, 1993, p. 209). This vector requires an intentional plan for action and a set of priorities that integrate three elements: (1) vocational plans and aspirations, (2) personal interests, and (3) interpersonal and family commitments. A strong commitment to a value or belief is integral in determining one's purpose (Chickering & Reisser).

Developing integrity. The final vector, developing integrity, is closely related to establishing identity and clarifying purpose. "Our core values and beliefs provide the foundation for interpreting experience, guiding behavior, and maintain self-respect" (Chickering & Reisser, 1993, p. 235). Developing integrity involves three sequential and overlapping stages: (1) humanizing values, (2) personalizing values, and (3) developing congruence. Therefore, students balance their own self-interests with the interests of others, affirm their own core values and beliefs while respecting others, and emulate their personal values through socially responsible behavior (Chickering & Reisser).

Research on Psychosocial Identity Development

Studies on psychosocial identity development, specifically the work of Chickering and Reisser (1993), include research on population specific development, factors associated with psychosocial development, and validation of the theory. Research on various specific student populations has included studies on racial identity of Black college students (Pope, 1998), first-year college students (Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013), community college students (Rogers, 2004), American Indian college students (Ecklund, 2005), gender and class-standing (Jones & Watt, 2001),

Greek-letter students (Ray, 2004), and students with disabilities (Buggie-Hunt, 2007, Costello & English, 2001). Psychosocial development has been linked to many factors including moral orientation (Jones & Watt, 1999), parental attachment (Taub, 1997), academic and co-curricular involvement (Huang & Chang, 2004), leadership (Cauthen, 2012), and technology use (Lloyd, Dean, & Cooper, 2009). Several studies have investigated the validity of Chickering and Reisser's theory (Martin, 2000, Mather & Winston, 1998; Foubert, Nixon, Sisson & Barnes, 2005; Wachs & Cooper, 2002).

Some of the specific findings from the studies above are directly related to the research about students with the Broader Autism Phenotype. Huang and Chang (2004) found that involvement in academic and co-curricular activities maximized growth. Social activities are potentially an area of struggle for individuals on the BAP. In addition, Costello and English (2001) found that there were significant differences between students with and without learning disabilities in terms of academic autonomy and mature interpersonal relationships. Their findings showed that students with learning disabilities tend to develop more dependent and less mature relationships than their peers without learning disabilities. While students with the BAP do not have a diagnosed disability, they share characteristics of those with ASD. Together these studies further support research on the psychosocial development of students with the BAP.

Chapter Summary

This review of literature included a history and description of Autism Spectrum Disorders, legal issues associated with disabilities, accommodations and transitions of students with disabilities, research on individuals with the Broader Autism Phenotype, and an overview of psychosocial development. A search for the psychosocial

development of students with the Broader Autism Phenotype yielded no published research.

College students are more likely to persist and complete degrees when they interact with their peers (Pascarella & Terenzini, 2005). In addition, students often learn more from their peers and remember the time they spend with others, including acquaintances, teammates, roommates, organization members, friends, and partners, during the undergraduate years more than the content of their college courses (Chickering & Reisser, 1993). However, many of the characteristics of Autism Spectrum Disorders include difficulties with social interactions. Therefore, it is critically important to understand how students with characteristics of autism develop psychosocially in college.

CHAPTER 3

METHODOLOGY

This study explored the relationship between psychosocial developmental tasks and the Broader Autism Phenotype (BAP). This chapter explains the design of the study, describes the research instruments, reviews data collection procedures, describes the participants, and details the data analysis plan.

The purpose of this study was to explore the psychosocial development of college students with the Broader Autism Phenotype. The following research questions guided this study:

RQ1: What are the demographic characteristics of student with characteristics of the Broader Autism Phenotype?

RQ2: Is there a difference between the psychosocial development, as measured by the *Student Developmental Task and Lifestyle Assessment* (SDTLA) subtasks, of students with the Broader Autism Phenotype and neurotypical students?

RQ3: Is there a relationship between the subscale scores on the *Autism-Spectrum Quotient* (Social skills, Attention switching, Attention to detail, Communication, and Imagination) and the students' psychosocial development as measured by the *Student Developmental Task and Lifestyle Assessment* subtasks (Peer relationships, Emotional Autonomy, and Interdependence)?

Overview of the Design

The design of this study was quantitative in nature and did not impose a treatment or intervention. A survey design provides numeric descriptions of trends, attitudes, or

opinions of a population by studying a sample of that population (Creswell, 2009). These results help the researcher make generalizations about the population of interest. The instrumentation for this study included two existing instruments, which are described in the next section.

Instrumentation

This study was conducted using two previously tested instruments from earlier research: *Student Developmental Task and Lifestyle Assessment* (Winston, Miller, & Cooper, 1999) and *The Autism-Spectrum Quotient* (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001).

Student Development Task and Lifestyle Assessment.

The *Student Developmental Task and Lifestyle Assessment* (SDTLA) (Winston, Miller, & Cooper, 1999) was developed using Chickering and Reisser's model of identity development for college students. The SDTLA assesses specific behaviors and attitudes theoretically grounded in Chickering and Reisser's (1993) psychosocial development model. The SDTLA was revised from the *Student Development Task Inventory* (SDTI) and the Student Developmental Task and Lifestyle Inventory (SDTLI). These earlier versions were used primarily as counseling tools to help students in their self-exploration. The SDTLA was created to help with program evaluations, research on psychosocial development, and outcomes assessments (Winston, Miller, & Cooper).

The SDTLA is comprised of three tasks. These tasks include (a) Establishing and Clarifying Purpose, (a) Developing Autonomy, and (c) Mature Interpersonal Relationships; the instrument also includes two scales, (a) Salubrious Lifestyle and (b) Response Bias. Each task is then broken down into subtasks as shown in Table 3. Based

on the purpose of this study, students were only asked to complete the Emotional Autonomy, Interdependence, and Peer Relationships subtasks. These subtasks are most closely related to the characteristics found in those individuals with the Broader Autism Phenotype, including social skills, interpersonal skills, relationships with others, and patterns of behavior.

Table 4

Relationship between SDTLA Tasks and Subtasks (Winston et al., 1999).

Task	Subtask
Establishing and Clarifying Purpose (PUR)	Educational Involvement Subtask (EI) Career Planning Subtask (CP) Lifestyle Planning Subtask (LP) Cultural Participation Subtask (CUP)
Developing Autonomy Task (AUT)	Emotional Autonomy Subtask (EA) Interdependence Subtask (IND) Academic Autonomy Subtask (AA) Instrumental Autonomy Subtask (IA)
Mature Interpersonal Relationships Task (MIR)	Peer Relationships Subtask (PR) Tolerance Subtask (TOL)

The Emotional Autonomy subtask (EA) is comprised of 17 items and measures the degree to which students are free from the need for approval from others, continuous reassurance, and reliance on parents (Winston et al., 1999). There are four multiple choice questions, one true or false question, and 12 questions that involve students selecting a response from the scale of *never (almost never) true of me, seldom true of me, usually true of me,* and *always true of me,* as well as the scale that includes *never, seldom, sometimes, often.* The Interdependence subtask (IND) contains 14 items and measures the degree to which students are involved in their community (Winston et al.). The items include seven multiple choice, five using the range of responses above, and two using the range of responses of *strongly agree, agree, disagree,* and *strongly disagree.* The Peer

Relationships subtask (PR) is comprised of 10 items and measures the degree to which students can distinguish between friendships and acquaintances, and the degree to which they describe their relationships as having trust, independence, and individuality (Winston et al.). Within these items, there are two multiple choice, one true or false, and seven questions using the two ranges of *never* through *often*. The measure of reliability is strong for all three subtasks. Cronbach's alpha coefficients are as follows: EI subtask is .71, IND subtask is .62 and PR subtask is .65. The normative sample was comprised of responses from 1458 students (ages 17 to 25) enrolled in 31 colleges and universities in the United States and Canada. The SDTLA has been used extensively to study undergraduate students, ages 17-25 (Cauthen, 2012; Dupré-Casanova, 2008; Jones & Watt, 1999; Jones & Watt, 2001; Lloyd, Dean, & Cooper, 2009; Pope, 1998; Ray, 2004; Watt & Vodanovich, 1999).

The Autism-Spectrum Quotient. The *Autism-Spectrum Quotient* (AQ) was developed using the triad (social interactions, communication and imagination, and repetitive and restricted patterns of behavior) that demonstrates the areas of cognitive abnormality in autism spectrum disorders (Baron-Cohen et al., 2001). The AQ was developed to identify individuals with the Broader Autism Phenotype. The authors stated: "We wish to underline that the AQ is not a diagnostic, but may serve as a useful instrument in identifying the extent of autistic traits shown by an adult of normal intelligence" (Baron-Cohen et al., 2001, p. 14-15). The AQ measures the level of autistic traits that an individual may possess without having an Autism Spectrum Disorders diagnosis.

The AQ comprises 50 questions, made up of 10 questions each assessing five different areas: social skills, attention switching, attention to detail, communication, and imagination (Appendix 1). Approximately half of the items are worded to produce a "disagree" response and half an "agree" response in order to help avoid a response bias either way. A score of 32+ has been used as the cut-off suggesting that the individuals may have traits more strongly associated with a diagnosis of Autism Spectrum Disorder (Baron-Cohen et al., 2001). Scores ranging from 23-32 are most indicative of individuals with the BAP (Wheelwright, Auyeung, Allison, & Baron-Cohen, 2010). The test-retest reliability of the scale is .70 (Baron-Cohen et al.), and the internal consistency (Cronbach alpha) of the AQ is 0.82 (Austin, 2005). Cronbachs' alpha coefficients were all moderate to high: Social Skills = .77, Attention Switching = .67, Attention to Detail = .63, Communication = .65, and Imagination. The *Autism-Spectrum Quotient* has been widely used with college students (Austin, 2003; Baron-Cohen et al., 2001; Chen & Yoon, 2011; Hurst, Mitchell, Kimbrel, Kwapil, & Nelson-Gray, 2007; Ingersoll, 2012; Jobe & White, 2007; Romano, Truzoli, Osborne, & Reed, 2014; Sasson, Nowlin, & Pinkham, 2013; Wainer, Ingersoll, & Hopwood, 2011; Wakabayashi, Baron-Cohen, & Wheelwright, 2006; Wakabayashi, Baron-Cohen, Wheelwright, & Tojo, 2006; Wheelwright et al., 2006). In addition, other studies have looked at adults between the ages of 17-50 (Golan, Baron-Cohen, Hill, & Rutherford, 2007; Scheeren & Stauder, 2008; Wheelwright, Auyeung, Allison, & Baron-Cohen, 2010).

There are other instruments available to identify and measure individuals with the BAP; the *Broad Autism Phenotype Questionnaire* (BAPQ) (Hurley et al., 2007) and the *Broader Phenotype Autism Symptom Scale* (BPASS) (Dawson et al., 2005). The AQ was

chosen for this study because it has been used so extensively with college students and because it was the first instrument created to identify individuals with the BAP. However, there is criticism regarding the instrument's reliability and cut-off score. Broadbent, Galic, and Stokes (2013) validated the study using an Australian sample; however, they found while the psychometrics of the study were sound, the two subscales Communication and Imagination had lower reliability ratings. The study by Austin (2005) found lower reliability values for Attention Switching, Attention to Detail, Communication, and Imagination subscales. In the study by Jobe and White (2007), the Attention Switching and Imagination subscales had lower reliability. Hurst et al. (2007) suggested that the psychometric properties of the AQ need improvement. Two studies have suggested that there is a better cut-off score than the 32 purported by Baron-Cohen et al. (2001), with suggestions ranging from 26-29 (Broadbent, Galic, & Stokes, 2013; Woodbury-Smith, Robinson, Wheelwright, & Baron-Cohen, 2005). Because this study used the AQ score range of 23 to 32 to identify individuals with the BAP, the cut-off score of 32+ was utilized.

Participants

Participants for this study were students at a large public institution in the Southeast. The institution's total enrollment is approximately 24,600 students with 22,600 of those listed as undergraduate students. The focus of this study was psychosocial development as measured by the STDLA, which "reports about feelings and attitudes that are indicative of students who have satisfactorily achieved certain developmental tasks common to young adult college students between the ages of 17 and 25" (Winston et al., 1999, p. 11). For this study, eligible students were between 18 and

25 years and agreed to participate in the study. Participants were enrolled in an introductory psychology course and received course credit for participating. This course contained a cross spectrum of 1000 students who differed in class standing, gender, age, race/ethnicity, and major.

In order to determine the sample size, the researcher used power calculations. Based on the information in the study by Baron-Cohen et al. (2001), which had a 16.4 mean from the control and an assumption of one standard deviation change, power was calculated. Assuming a medium effect size, an alpha of .05%, and a power of .9, a total of 61 participants in each group is needed. Therefore, this means that at least 61 of the participants needed to score between 23 and 32 on the AQ, as that is the range to characteristic of the Broader Autism Phenotype.

Data Collection

The researcher obtained approval from the host study site's Institutional Review Board as well as from the site where the participants were recruited (Appendices F & G). The study was loaded into a research system that all students enrolled in the introductory psychology course could access. Students were required to complete two research credits for their course, and participation in this study counted for one credit. In order to complete the study, students logged in to the research system and saw a list of potential research studies, which included face-to-face, online, and mixed methods options. Students who selected this study were routed to a web-based questionnaire consisting of 96 items including demographic questions. Participants first read the consent form (Appendix D), which stated that the study sought to understand the relationship between psychosocial development and the broader phenotype in college students. They were

then made aware that information was withheld in order to make it a valid study. After completing the 96 items, a debriefing letter (Appendix E) was used to tell participants that the word "autism" was removed from the consent form and why. They were given background information and a link to the Baron-Cohen et al. (2001) study for more information.

The study was loaded into the research database for the introductory to psychology course in early September and was open for three weeks. Responses were collected on a secure server through the host institution's Qualtrics license.

Data Analysis

Three research questions guided this study. Within the third question, there were multiple questions that the research addressed. In the following sections, the data analysis techniques are discussed.

Research Question 1

RQ1: What are the demographic characteristics of students with characteristics of the Broader Autism Phenotype? Descriptive statistics were used to examine the demographic information collected. The *Autism-Spectrum Quotient* provides a binary result using a score range of 23 to 32 (Wheelwright, Auyeung, Allison, & Baron-Cohen, 2010). The binary consists of those who have the characteristics of the Broader Autism Phenotype and those who do not. To clarify, students who scored 22 and below on the AQ are considered neurotypical, 23 to 32 with the BAP, and scores above that were removed from the study.

Research Question 2

RQ2: Is there a difference between the psychosocial development, as measured the *Student Developmental Task and Lifestyle Assessment (*SDTLA) subtasks, of students with the broader autism phenotype (BAP) and neurotypical students?

RQ2.1: Is there a difference between neurotypical and BAP students on the subtask Peer Relationships (PR)?

RQ2.2: Is there a difference between neurotypical and BAP students on the subtask Emotional Autonomy (EA)?

RQ2.3: Is there a difference between neurotypical and BAP students on the subtask Interdependence (IND)?

The second research question and its sub-questions were analyzed using an independent samples t-test.

Research Question 3

RQ3: Is there a relationship between the subscale scores on the *Autism-Spectrum Quotient* (Social skills, Attention switching, Attention to detail, Communication, and Imagination) and the students' psychosocial development as measured by the *Student Developmental Task and Lifestyle Assessment* subtasks (Peer relationships, Emotional Autonomy, and Interdependence)?

RQ3.1: Is there a relationship between social skills and peer relationships?

RQ3.2: Is there a relationship between social skills and emotional autonomy?

RQ3.3: Is there a relationship between social skills and interdependence?

RQ3.4: Is there a relationship between attention switching and peer relationships?

RQ3.5: Is there a relationship between attention switching and emotional autonomy?

RQ3.6: Is there a relationship between attention switching and interdependence?

RQ3.7: Is there a relationship between attention to detail and peer relationships?

RQ3.8: Is there a relationship between attention to detail and emotional autonomy?

RQ3.9: Is there a relationship between attention to detail and interdependence?

RQ3.10: Is there a relationship between communication and peer relationships?

RQ3.11: Is there a relationship between communication and emotional autonomy?

RQ3.12: Is there a relationship between communication and interdependence?

RQ3.13: Is there a relationship between imagination and peer relationships?

RQ3.14: Is there a relationship between imagination and emotional autonomy?

RQ3.15: Is there a relationship between imagination and interdependence?

Research question three and its sub-questions were analyzed using a multiple analysis of variance (MANOVA), controlling for class and gender, because these were the independent variables used in the normative sample for the SDTLA (Winston, Miller, & Cooper, 1999).

Delimitation

Prior to completing this study, an identified delimitation of the design was the unknown population of students with the Broader Autism Phenotype. Since it was not possible to ascertain how many students were classified with the BAP, it was difficult to project the overall population size and response rate.

CHAPTER 4

FINDINGS

This chapter presents the results of the statistical data analysis associated with each research question in this exploratory study to further understand the relationship between the Broader Autism Phenotype and psychosocial development in college students. The data analyses for each research question and sub-questions are presented in this chapter.

Participant Demographics

The respondents for this study were enrolled in an introductory psychology course at one institution; the sample included approximately 1000 students with 283 completed instruments usable for data analysis (28.3% return rate). Seven responses were incomplete and removed. An additional four responses were removed because the participants were over the age of 25. Finally, four additional responses were removed because they were above the AQ cut-off score of 32 (Baron-Cohen et al., 2001). With the removal of these 15 responses, the total number included in analysis was 268. Because the participants were recruited through an online database, response rate is not exact, but is estimated at about 26.8% (n = 268) over a three-week period.

Participants responded to several demographic questions including gender, age, class standing, race/ethnicity, and major (Table 5). Of the 268 responses, there were 210 females (78.4%) and 57 males (21.2%) and one student who chose not to specify gender, representing the final 0.4%. In terms of race/ethnicity, 13.4% (N = 36) identified as

African American/Black, 0.4% (N = 1) as American Indian/Alaska Native, 6.3% (N = 17) as Asian American/Asian, 6.0% (N = 16) as Latino/Hispanic, 0.7% (N = 2) as Middle Eastern, 4.9% (N = 13) as Multiracial, 66.8% (N = 179) as White/Caucasian, and 1.5% (N = 4) responded in the survey that their race/ethnicity was not included in the options provided above.

In order to participate in the study, participants needed to be between the ages of 18-25 years because this is the age range of the normative sample for the *Student Developmental Task and Lifestyle Assessment* (SDTLA) (Winston, Miller, & Cooper, 1999). With regard to age, a little more than half (52.6%) of the respondents were 18 (N = 141), 26.1% (N = 70) 19 years, 10.8% (N = 29) 20 years, 3.7% (N = 10) 21 years, 1.1% (N = 3) 22 years, 1.5% (N = 4) 23 years, 3.0% (N = 8) 24 years, and 1.1% (N =3) 25 years. In terms of classification, 62.3% (N = 167) were freshman/first-year, 26.9% (N = 72) sophomore, 9.7% (N = 26) junior, 1.1% (N = 3) senior, and none were in their fifth year of college or beyond.

Table 5

Demographic Data for All Participants

Variable	N	Percent
Gender		
Male	57	21.2
Female	210	78.4
Not Specified	1	0.4
Age		
18	141	52.6
19	70	26.1
20	29	10.8
21	10	3.7
22	3	1.1
23	4	1.5
24	8	3.0
25	3	1.1
Current Class Standing		

Freshman/First-year	167	62.3
Sophomore	72	26.9
Junior	26	9.7
Senior	3	1.1
Race/Ethnicity		
African American/Black	36	13.4
American Indian/Alaska Native	1	0.4
Asian American/Asian	17	6.3
Latino/Hispanic	16	6.0
Middle Eastern	2	0.7
Multiracial	13	4.9
White/Caucasian	179	66.8
Race/Ethnicity Not Included Above	4	1.5

The mean AQ score for all participants was 17.72 (*SD* = 4.9). The mean AQ score for those with the BAP was 25.07 (*SD* = 2.33) and for the neurotypicals *M* = 16.28, *SD* = 3.87. Using an independent samples t-test, the difference between the AQ scores for the BAP and neurotypicals was statistically significant, $t(266) = 8.79$, $p = .00$, $d = 2.39$. The BAP score was 8.79 (*SE* = .60) higher than the neurotypical score. This means that the BAP students exhibit the characteristics associated with autism spectrum disorders, as measured by the AQ, at a higher rate than the neurotypical students do.

Scale Reliability

This study utilized two previously developed instruments, the *Student Developmental Task and Lifestyle Assessment* (Winston, Miller, & Cooper, 1999) subtasks Emotional Autonomy, Peer Relationships, and Interdependence, and the *Autism-Spectrum Quotient*, including the subscales social skills, attention switching, attention to detail, communication, and imagination (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). Each of these instruments and their subscales/subtasks has reliability

measures as discussed in Chapter 3. Prior to data analysis, reliability measures based on the data collected for this study were conducted (Table 6).

The reliability measures for this study provide similar Cronbach alpha scores as those generated by the previous research and development of the instruments (Table 6). For the AQ subscales, the scores range from .43 for Imagination to .64 for Attention to Detail. For the SDTLA, the scores range from .60 for Peer Relationships and Emotional Autonomy to .71 for Interdependence. Cronbach alpha scores were lower than the previous study scores with the exception of the Attention to Detail subscale. Overall, the reliability measures for the study are low to medium, which is discussed in further detail in Chapter 5.

Table 6

Scale Reliability Comparison

	Cronbach's α	
Scale	Previous Research	Current Study
AQ	.70[a]	.63
Social Skills	.77 [a]	.55
Attention Switching	.67 [a]	.54
Attention to Detail	.63 [a]	.64
Communication	.65 [a]	.56
Imagination	.65 [a]	.43
SDTLA		
Peer Relationships Subtask	.65[b]	.60
Emotional Autonomy Subtask	.71[b]	.60
Interdependence Subtask	.76[b]	.71

[a]Baron-Cohen, et al. (2001). [b] Winston, Miller, & Cooper (1999).

Research Question 1: Demographic Characteristics

The students with the Broader Autism Phenotype (BAP) were identified by their scores on the AQ. Participants with scores between 23 and 32 were identified as having the BAP and those that scored 22 and under were categorized as neurotypical. Any score above 32 was removed from the study because scores above this cut-off suggest that the

individuals may have traits more strongly associated with a diagnosis of Autism Spectrum Disorder. The first research question addressed the demographic characteristics of students with characteristics of the Broader Autism Phenotype. Table 7 provides the demographic information for those with the BAP including gender, age, class standing, race/ethnicity, and major.

Of the 44 BAP responses, there were 31 females (70.5%) and 13 males (29.5%). In terms of race/ethnicity, 18.2% (N = 8) identified as African American/Black, 6.8% (N = 3) as Asian American/Asian, 4.5% (N = 2) as Latino/Hispanic, 4.5% (N = 2) as Multiracial, 63.6% (N = 28) as White/Caucasian, and 2.3% (N = 1) responded that their race/ethnicity was not included in the above. There were no respondents with the BAP who identified as American Indian/Alaska Native or Middle Eastern.

In response to age, a little more than half (54.5%) of the respondents were 18 (N=24) years old, 22.7% (N=10) 19 years old, 18.2% (N = 8) 20 years old, 2.3% (N = 1) 21 years old, and 2.3% (N = 1) 22 years old. There were no respondents with the BAP above the age of 22 years old. In terms of classification, 68.2% (N = 30) were freshman/first-year, 25.0% (N = 11) sophomore, 6.8% (N = 3) junior, and zero were senior or fifth year and beyond. Respondents were asked to share their major(s). Nursing (N = 11), undecided/undeclared (N = 20), and psychology (N = 6) were the most frequent responses.

Table 7

Demographic Data for Participants with the Broader Autism Phenotype and Neurotypical Participants

Variable	*BAP Participants*		*Neurotypical Participants*	
	N	Percent	n	Percent
Gender				
Male	13	29.5	44	19.6

Female	31	70.5	179	79.9
Not Specified	0	0.0	1	0.4
Age				
18	24	54.5	117	52.2
19	10	22.7	60	26.8
20	8	18.2	21	9.4
21	1	2.3	9	4.0
22	1	2.3	2	0.9
23	0	0.0	4	1.8
24	0	0.0	8	3.6
25	0	0.0	3	1.3
Current Class Standing				
Freshman/First-year	30	68.2	137	61.2
Sophomore	11	25.0	61	27.2
Junior	3	6.8	23	10.3
Senior	0	0.0	3	1.3
Fifth Year and Beyond	0	0.0	0	0.0
Race/Ethnicity				
African American/Black	8	18.2	28	12.5
American Indian/Alaska Native	0	0.0	1	0.4
Asian American/Asian	3	6.8	14	6.3
Latino/Hispanic	2	4.5	14	6.3
Middle Eastern	0	0.0	2	0.9
Multiracial	2	4.5	11	4.9
White/Caucasian	28	63.6	151	67.4
Race/Ethnicity Not Included Above	1	2.3	3	1.3
Major				
Accounting	0	0.0	3	1.3
Anthropology	0	0.0	2	0.9
Biochemistry	0	0.0	1	0.4
Biology	3	6.8	25	11.2
Biotechnology	0	0.0	3	1.3
Business	1	2.3	11	4.9
Chemistry	0	0.0	5	2.2
Communications	0	0.0	3	1.3
Computer Science	0	0.0	1	0.4
Criminal Justice	1	2.3	4	1.8
Education	3	6.8	5	2.2
English	0	0.0	3	1.3
Exercise Science	2	4.5	17	7.6
Finance	2	4.5	3	1.3
Human Services	1	2.3	4	1.8
Marketing	1	2.3	0	0.0
Industrial Design	0	0.0	1	0.4
Information Security	0	0.0	1	0.4

Integrated Studies	0	0.0	1	0.4
International Business	0	0.0	3	1.3
Media	0	0.0	3	1.3
Marketing	0	0.0	2	0.9
Nursing	11	25.0	68	30.4
Physical Therapy	1	2.3	0	0.0
Political Science	1	2.3	4	1.8
Psychology	6	13.6	22	9.8
Sociology	1	2.3	2	0.9
Speech Pathology	0	0.0	1	0.4
Undecided/Undeclared	10	22.7	26	11.6

Forty-four respondents met the criteria for the Broader Autism Phenotype. While they made up only 16% of the total responses, the demographic information appear very similar between both the BAP and neurotypical student groups in their distribution. Furthermore, this suggests that one in every six students in this sample may have characteristics associated with the Broader Autism Phenotype.

Research Question 2: Psychosocial Development

The second research question addressed the difference between scores for psychosocial development, as measured by the SDTLA subtasks, of students with the Broader Autism Phenotype and neurotypical students. In order to explore this research question more fully, three sub-questions were addressed.

Research Question 2.1: Peer Relationships

An independent samples t-test determined if there were differences in scores on the Peer Relationships (PR) subtask between individuals with the Broader Autism Phenotype and neurotypicals. Participants with the BAP scored lower on the PR subtask (M = 3.30, SE = .111) than the neurotypical respondents (M = 3.56, SE = .039). There was a homogeneity of variances for peer relationships scores for individuals with the BAP and neurotypicals, as assessed by Levene's test for equality of variances (p = .06).

Neurotypical respondents' PR score was 0.26 (*SE* = 0.10) higher than the score for those with the BAP. There was a statistically significant difference in PR scores between neurotypical and BAP respondents, with neurotypical students scoring higher than BAP students, $t(266) = 2.59$, $p = 0.01$, $d = .42$. This indicates that the neurotypical students are further along in their development related to peer relationships than students with the BAP. In Chapter Five, the meaning and implications for this finding are explored.

Research Question 2.2: Emotional Autonomy

Independent samples t-test determined if there were differences in scores on the Emotional Autonomy (EA) subtask between individuals with the Broader Autism Phenotype and neurotypicals. Participants with the BAP scored lower on the EA subtask (*M* = 2.93, *SE* = .076) than the neurotypical respondents (*M* = 3.20, *SE* = .040). There was not a homogeneity of variances for emotional autonomy scores for individuals with the BAP and neurotypicals, as assessed by Levene's test for equality of variances ($p = .004$); therefore analysis used equal variances not assumed to generate the results. Neurotypical respondents' EA score was 0.27 (*SE* = 0.09) higher than the score for those with the BAP. There was a statistically significant difference in EA scores between neurotypical and BAP respondents, with neurotypical students scoring higher than BAP students, $t(68.75) = 3.16$, $p = 0.002$, $d = .47$. This finding denotes that the neurotypical student participants are further along in their development related to emotional autonomy than the BAP students.

Research Question 2.3: Interdependence

Independent samples t-test determined if there were differences in scores on the Interdependence (IND) subtask between individuals with the Broader Autism Phenotype

and neurotypicals. Participants with the BAP scored lower on the IND subtask (M = 2.45, SE = .100) than the neurotypical respondents (M = 2.76, SE = .043). There was a homogeneity of variances for interdependence scores for individuals with the BAP and neurotypicals, as assessed by Levene's test for equality of variances (p = .469). Neurotypical respondents' IND score was 0.31 (SE = 0.11) higher than the score for those with the BAP. There was a statistically significant difference in IND scores between neurotypical and BAP respondents, with neurotypical students scoring higher than BAP students, $t(266) = 2.87$, $p = 0.004$, $d = .47$. The difference in scores for BAP students and neurotypicals suggests that the neurotypical students are further along in their development related to interdependence.

Research Question 3: Relationships between AQ and SDLTA Scores

The third research question addressed the relationships between the subscale scores on the *Autism-Spectrum Quotient* (Social Skills, Attention Switching, Attention to Detail, Communication, and Imagination) and the students' psychosocial development as measured by the *Student Developmental Task and Lifestyle Assessment* subtasks (Emotional Autonomy, Interdependence, and Peer Relationships). In order to explore this research question more fully, 15 sub-questions were addressed.

Analysis of the frequency in responses to the *Autism-Spectrum Quotient* subscales showed a small number of responses to some of the individual items. In order to run a valid statistical test, many of the responses to the subscales were collapsed. To determine which responses to collapse, frequency of responses for each of the subscale items were calculated. If there were less than 7 responses to an item, it was collapsed. The decision to collapse these responses was made so that the analysis did not violate statistical tests.

The following tables (Tables 8 through 12) show the initial frequency responses and the collapsed responses as used in the analysis for this study.

Table 8.1

Raw Data AQ – Social Subscale

Response	Frequency	Percent
0	19	7.1
1	78	29.1
2	58	21.6
3	46	17.2
4	16	6.0
5	26	9.7
6	18	6.7
7	5	1.9
8	2	0.7

Table 8.2

Collapsed Data AQ – Social Subscale

Response	Frequency	Percent
0	19	7.1
1	78	29.1
2	58	21.6
3	46	17.2
4	16	6.0
5	26	9.7
6	25	9.3

Table 9.1

Raw Data AQ – Attention Switching Subscale

Response	Frequency	Percent
0	1	0.4
1	11	4.1
2	21	7.8
3	38	14.2
4	44	16.4
5	53	19.8
6	41	15.3
7	29	10.8
8	19	7.1
9	8	3.0
10	3	1.1

Table 9.2

Collapsed Data AQ – Attention Switching Subscale

Response	Frequency	Percent
1	12	4.5
2	21	7.8
3	38	14.2
4	44	16.4
5	53	19.8
6	41	15.3
7	29	10.8
8	19	7.1
9	11	4.1

Table 10.1

Raw Data AQ – Attention to Detail Subscale

Response	Frequency	Percent
0	3	1.1
1	10	3.7
2	16	6.0
3	15	5.6
4	31	11.6
5	39	14.6
6	64	23.9
7	36	13.4
8	28	10.4
9	19	7.1
10	7	2.6

Table 10.2

Collapsed Data AQ – Attention to Detail Subscale

Response	Frequency	Percent
1	13	4.9
2	16	6.0
3	15	5.6
4	31	11.6
5	39	14.6
6	64	23.9
7	36	13.4
8	28	10.4
9	26	9.7

Table 11.1

Raw Data AQ – Communication Subscale

Response	Frequency	Percent
0	38	14.2
1	48	17.9
2	51	19.0
3	51	19.0
4	26	9.7
5	28	10.7
6	17	6.3
7	3	1.1
8	5	1.9
9	1	0.4

Table 11.2

Collapsed Data AQ – Communication Subscale

Response	Frequency	Percent
0	38	14.2
1	48	17.9
2	51	19.0
3	51	19.0
4	26	9.7
5	28	10.4
6	17	6.3
7	9	3.4

Table 12.1

Raw Data AQ – Imagination Subscale

Response	Frequency	Percent
0	31	11.6
1	68	25.4
2	61	22.8
3	52	19.4
4	29	10.8
5	12	4.5
6	11	4.1
7	2	0.7
8	2	0.7

Table 12.2

Collapsed Data AQ – Imagination Subscale

Response	**Frequency**	**Percent**
0	31	11.6
1	68	25.4
2	61	22.8
3	52	19.4
4	29	10.8
5	12	4.5
6	15	5.6

A multiple analysis of variance (MANOVA) was used to answer research question three and its sub-questions. A MANOVA tested for differences in means when there are two or more dependent variables. For this study, the scores on the subtasks of the SDTLA and the subscales of the *Autism-Spectrum Quotient* represent the dependent variables and class and gender represent the independent variables. Frequency distribution showed that there were very few respondents in the junior (9.7%) and senior (1.1%) classes. There were zero respondents who were classified as seniors. To perform the analysis, respondents who identified as juniors and seniors were collapsed to form an upper-class student's classification (Table 13). For gender, there was one respondent who selected "not specified." This respondent's data was removed for the analysis controlling for gender. Summary data for all sub-questions using the independent variable class are available in Table 14 and for the independent variable gender, Table 15, which follow the descriptions of each sub-question for RQ3.

Table 13

Collapsed Demographic Information on Class

Variable	N	Percent
Current Class Standing		
Freshman/First-year	167	62.3
Sophomore	72	26.9
Upper-class students	29	10.8

Research Question 3.1: Peer Relationships and Social Skills

A one-way multivariate analysis of variance determined if there was a relationship between scores on the Peer Relationships (PR) subtask and the *Autism-Spectrum Quotient* subscale Social Skills, controlling for class. The means and standard deviations for the PR subtask were first-year students $M = 3.48$, $SD = 0.63$; sophomores $M = 3.53$, $SD = 0.60$; and upper-class students $M = 3.69$, $SD = 0.60$. The means and standard deviations for the Social Skills subscale were first-year students $M = 2.63$, $SD = 1.81$; sophomores $M = 2.39$, $SD = 1.65$; and upper-class students $M = 2.52$, $SD = 1.76$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.091$, $p = .360$; Wilks' $\wedge = .984$; partial $\eta^2 = .008$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the PR subtask and the AQ subscale Social Skills, controlling for gender. The means and standard deviations for the PR subtask were male students $M = 3.37$, $SD = 0.56$ and female students $M = 3.51$, $SD = 0.56$. The means and standard deviations for the Social Skills subscale were male students $M = 2.83$, $SD = 1.67$ and female students $M = 2.45$, $SD = 1.78$. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 2.004$, $p = .137$; Wilks' $\wedge = .985$; partial $\eta^2 = .015$.

Research Question 3.2: Emotional Autonomy and Social Skills

A one-way multivariate analysis of variance determined if there was a relationship between scores on the Emotional Autonomy (EA) subtask and the *Autism-Spectrum Quotient* subscale Social Skills, controlling for class. The means and standard deviations for the EA subtask were first-year students $M = 3.08$, $SD = 0.58$; sophomores

M = 3.25, *SD* = 0.60; and upper-class students *M* = 3.34, *SD* = 0.55. The means and standard deviations for the Social Skills subscale were first-year students *M* = 2.63, *SD* = 1.81; sophomores *M* = 2.39, *SD* = 1.65; and upper-class students *M* = 2.52, *SD* = 1.76. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 2.004$, $p = .093$; Wilks' $\wedge = .970$; partial $\eta^2 = .015$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the EA subtask and the AQ subscale Social Skills, controlling for gender. The means and standard deviations for the EA subtask were male students *M* = 3.07, *SD* = 0.48 and female students *M* = 3.19, *SD* = 0.46. The means and standard deviations for the Social Skills subscale were male students *M* = 2.83, *SD* = 1.67 and female students *M* = 2.45, *SD* = 1.78. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.989$, $p = .139$; Wilks' $\wedge = .985$; partial $\eta^2 = .015$.

Research Question 3.3: Interdependence and Social Skills

A one-way multivariate analysis of variance determined if there was a relationship between scores on the Interdependence (IND) subtask and the *Autism-Spectrum Quotient* subscale Social Skills, controlling for class. The means and standard deviations for the IND subtask were first-year students *M* = 2.71, *SD* = 0.62; sophomores *M* = 2.72, *SD* = 0.74; and upper-class students *M* = 2.72, *SD* = 0.70. The means and standard deviations for the Social Skills subscale were first-year students *M* = 2.63, *SD* = 1.81; sophomores *M* = 2.39, *SD* = 1.65; and upper-class students *M* = 2.52, *SD* = 1.76. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = .512$, $p = .727$; Wilks' $\wedge = .992$; partial $\eta^2 = .004$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the IND subtask and AQ subscale Social Skills, controlling for gender. The means and standard deviations for the IND subtask were male students $M = 2.62$, $SD = 0.51$ and female students $M = 2.74$, $SD = 0.60$. The means and standard deviations for the Social Skills subscale were male students $M = 2.83$, $SD = 1.67$ and female students $M = 2.45$, $SD = 1.78$. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.551$, $p = .214$; Wilks' $\wedge = .988$; partial $\eta^2 = .012$.

Research Question 3.4: Peer Relationships and Attention Switching

A one-way multivariate analysis of variance determined if there was a relationship between scores on the Peer Relationships (PR) subtask and the *Autism-Spectrum Quotient* subscale Attention Switching, controlling for class. The means and standard deviations for the PR subtask were first-year students $M = 3.48$, $SD = 0.63$; sophomores $M = 3.53$, $SD = 0.60$; and upper-class students $M = 3.69$, $SD = 0.60$. The means and standard deviations for the Attention Switching subscale were first-year students $M = 5.03$, $SD = 2.04$; sophomores $M = 4.68$, $SD = 1.95$; and upper-class students $M = 4.55$, $SD = 1.96$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.147$, $p = .333$; Wilks' $\wedge = .983$; partial $\eta^2 = .009$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the PR subtask and the AQ subscale Attention Switching, controlling for gender. The means and standard deviations for the PR subtask were male students $M = 3.37$, $SD = 0.56$ and female students $M = 3.51$, $SD = 0.56$. The means and standard deviations for the Attention Switching subscale were male students $M = 5.16$,

SD = 1.94 and female students *M* = 4.83, *SD* = 2.01. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.611$, $p = .202$; Wilks' $\wedge = .988$; partial $\eta^2 = .012$.

Research Question 3.5: Emotional Autonomy and Attention Switching

A one-way multivariate analysis of variance determined if there was a relationship between scores on the Emotional Autonomy (EA) subtask and the *Autism-Spectrum Quotient* subscale Attention Switching, controlling for class. The means and standard deviations for the EA subtask were first-year students *M* = 3.08, *SD* = 0.58; sophomores *M* = 3.25, *SD* = 0.60; and upper-class students *M* = 3.34, *SD* = 0.55. The means and standard deviations for the Attention Switching subscale were first-year students *M* = 5.03, *SD* = 2.04; sophomores *M* = 4.68, *SD* = 1.95; and upper-class students *M* = 4.55, *SD* = 1.96. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 2.094$, $p = .080$; Wilks' $\wedge = .969$; partial $\eta^2 = .016$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the EA subtask and the AQ subscale Attention Switching, controlling for gender. The means and standard deviations for the EA subtask were male students *M* = 3.07, *SD* = 0.48 and female students *M* = 3.19, *SD* = 0.46. The means and standard deviations for the Attention Switching subscale were male students *M* = 5.16, *SD* = 1.94 and female students *M* = 4.83, *SD* = 2.01. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.798$, $p = .168$; Wilks' $\wedge = .987$; partial $\eta^2 = .013$.

Research Question 3.6: Interdependence and Attention Switching

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Interdependence (IND) subtask and the *Autism-Spectrum Quotient* subscale Attention Switching, controlling for class. The means and standard deviations for the IND subtask were first-year students $M = 2.71$, $SD = 0.62$; sophomores $M = 2.72$, $SD = 0.74$; and upper-class students $M = 2.72$, $SD = 0.70$. The means and standard deviations for the Attention Switching subscale were first-year students $M = 5.03$, $SD = 2.04$; sophomores $M = 4.68$, $SD = 1.95$; and upper-class students $M = 4.55$, $SD = 1.96$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = .608$, $p = .657$; Wilks' $\wedge = .991$; partial $\eta^2 = .005$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the IND subtask and the AQ subscale Attention Switching, controlling for gender. The means and standard deviations for the IND subtask were male students $M = 2.62$, $SD = 0.51$ and female students $M = 2.74$, $SD = 0.60$. The means and standard deviations for the Attention Switching subscale were male students $M = 5.16$, $SD = 1.94$ and female students $M = 4.83$, $SD = 2.01$. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.230$, $p = .294$; Wilks' $\wedge = .991$; partial $\eta^2 = .009$.

Research Question 3.7: Peer Relationships and Attention to Detail

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Peer Relationships (PR) subtask and the *Autism-Spectrum Quotient* subscale Attention to Detail, controlling for class. The means and standard deviations for the PR subtask were first-year students $M = 3.48$, $SD = 0.63$; sophomores $M = 3.53$, $SD =$

0.60; and upper-class students *M* = 3.69, *SD* = 0.60. The means and standard deviations for the Attention to Detail subscale were first-year students *M* = 5.39, *SD* = 2.10; sophomores *M* = 5.92, *SD* = 2.19; and upper-class students *M* = 6.10, *SD* = 2.13. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.738$, $p = .140$; Wilks' $\wedge = .974$; partial $\eta^2 = .013$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the PR subtask and the AQ subscale Attention to Detail, controlling for gender. The means and standard deviations for the PR subtask were male students *M* = 3.07, *SD* = 0.48 and female students *M* = 3.19, *SD* = 0.46. The means and standard deviations for the Attention to Detail subscale were male students *M* = 5.58, *SD* = 1.83 and female students *M* = 5.61, *SD* = 2.22. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.350$, $p = .261$; Wilks' $\wedge = .990$; partial $\eta^2 = .010$.

Research Question 3.8: Emotional Autonomy and Attention to Detail

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Emotional Autonomy (EA) subtask and the *Autism-Spectrum Quotient* subscale Attention to Detail, controlling for class. The means and standard deviations for the EA subtask were first-year students *M* = 3.08, *SD* = 0.58; sophomores *M* = 3.25, *SD* = 0.60; and upper-class students *M* = 3.34, *SD* = 0.55. The means and standard deviations for the Attention to Detail subscale were first-year students *M* = 5.39, *SD* = 2.10; sophomores *M* = 5.92, *SD* = 2.19; and upper-class students *M* = 6.10, *SD* = 2.13. The difference between the scores, based on class, was statistically significant, $F(4, 528) = 2.792$, $p = .026$; Wilks' $\wedge = .959$; partial $\eta^2 = .021$. This difference suggests there

is a significant difference between class on the combined measures of the EA subtask and the attention to detail subscale.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the EA subtask and the AQ subscale Attention to Detail, controlling for gender. The means and standard deviations for the EA subtask were male students $M = 3.07$, $SD = 0.48$ and female students $M = 3.19$, $SD = 0.46$. The means and standard deviations for the Attention to Detail subscale were male students $M = 5.58$, $SD = 1.83$ and female students $M = 5.61$, $SD = 2.22$. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.590$, $p = .206$; Wilks' $\wedge = .988$; partial $\eta^2 = .012$.

Research Question 3.9: Interdependence and Attention to Detail

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Interdependence (IND) subtask and the *Autism-Spectrum Quotient* subscale Attention to Detail, controlling for class. The means and standard deviations for the IND subtask were first-year students $M = 2.71$, $SD = 0.62$; sophomores $M = 2.72$, $SD = 0.74$; and upper-class students $M = 2.72$, $SD = 0.70$. The means and standard deviations for the Attention to Detail subscale were first-year students $M = 5.39$, $SD = 2.10$; sophomores $M = 5.92$, $SD = 2.19$; and upper-class students $M = 6.10$, $SD = 2.13$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.231$, $p = .297$; Wilks' $\wedge = .982$; partial $\eta^2 = .009$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the IND subtask and the AQ subscale Attention to Detail, controlling for gender. The means and standard deviations for the IND subtask were

male students *M* = 2.62, *SD* = 0.51 and female students *M* = 2.74, *SD* = 0.60. The means and standard deviations for the Attention to Detail subscale were male students *M* = 5.58, *SD* = 1.83 and female students *M* = 5.61, *SD* = 2.22. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 0.900$, $p = .408$; Wilks' $\wedge = .993$; partial $\eta^2 = .007$.

Research Question 3.10: Peer Relationships and Communication

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Peer Relationships (PR) subtask and the *Autism-Spectrum Quotient* subscale Communication, controlling for class. The means and standard deviations for the PR subtask were first-year students *M* = 3.48, *SD* = 0.63; sophomores *M* = 3.53, *SD* = 0.60; and upper-class students *M* = 3.69, *SD* = 0.60. The means and standard deviations for the Communication subscale were first-year students *M* = 2.72, *SD* = 1.89; sophomores *M* = 2.72, *SD* = 2.09; and upper-class students *M* = 2.10, *SD* = 1.61. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.134$, $p = .340$; Wilks' $\wedge = .983$; partial $\eta^2 = .009$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the PR subtask and the AQ subscale Communication, controlling for gender. The means and standard deviations for the PR subtask were male students *M* = 3.37, *SD* = 0.56 and female students *M* = 3.51, *SD* = 0.56. The means and standard deviations for the Communication subscale were male students *M* = 2.99, *SD* = 1.94 and female students *M* = 2.58, *SD* = 1.91. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.903$, $p = .151$; Wilks' $\wedge = .986$; partial $\eta^2 = .014$.

Research Question 3.11: Emotional Autonomy and Communication

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Emotional Autonomy (EA) subtask and the *Autism-Spectrum Quotient* subscale Communication, controlling for class. The means and standard deviations for the EA subtask were first-year students $M = 3.08$, $SD = 0.58$; sophomores $M = 3.25$, $SD = 0.60$; and upper-class students $M = 3.34$, $SD = 0.55$. The means and standard deviations for the Communication subscale were first-year students $M = 2.72$, $SD = 1.89$; sophomores $M = 2.72$, $SD = 2.09$; and upper-class students $M = 2.10$, $SD = 1.61$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 2.320$, $p = .056$; Wilks' $\wedge = .966$; partial $\eta^2 = .017$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the EA subtask and the AQ subscale Communication, controlling for gender. The means and standard deviations for the EA subtask were male students $M = 3.07$, $SD = 0.48$ and female students $M = 3.19$, $SD = 0.46$. The mean and standard deviations for the Communication subscale were male students $M = 2.99$, $SD = 1.94$ and female students $M = 2.58$, $SD = 1.91$. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 2.015$, $p = .135$; Wilks' $\wedge = .985$; partial $\eta^2 = .015$.

Research Question 3.12: Interdependence and Communication

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Interdependence (IND) subtask and the *Autism-Spectrum Quotient* subscale Communication, controlling for class. The means and standard deviations for the IND subtask were first-year students $M = 2.71$, $SD = 0.62$; sophomores $M = 2.72$, *SD*

= 0.74; and upper-class students *M* = 2.72, *SD* = 0.70. The means and standard deviations for the Communication subscale were first-year students *M* = 2.72, *SD* = 1.89; sophomores *M* = 2.72, *SD* = 2.09; and upper-class students *M* = 2.10, *SD* = 1.61. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = .690$, $p = .599$; Wilks' $\wedge = .990$; partial $\eta^2 = .005$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the (IND subtask and the AQ subscale Communication, controlling for gender. The mean and standard deviation for the IND subtask were male students *M* = 2.62, *SD* = 0.51 and female students *M* = 2.74, *SD* = 0.60. The means and standard deviations for the Communication subscale were male students *M* = 2.99, *SD* = 1.94 and female students *M* = 2.58, *SD* = 1.91. The difference between the scores, based on gender, was not statistically significant, $F(2, 264) = 1.531$, $p = .218$; Wilks' $\wedge = .989$; partial $\eta^2 = .011$.

Research Question 3.13: Peer Relationships and Imagination

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Peer Relationships (PR) subtask and the *Autism-Spectrum Quotient* subscale Imagination, controlling for class. The means and standard deviations for the PR subtask were first-year students *M* = 3.48, *SD* = 0.63; sophomores *M* = 3.53, *SD* = 0.60; and upper-class students *M* = 3.69, *SD* = 0.60. The means and standard deviations for the Imagination subscale were first-year students *M* = 2.18, *SD* = 1.62; sophomores *M* = 2.64, *SD* = 1.54; and upper-class students *M* = 2.00, *SD* = 1.56. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 2.010$, $p = .092$; Wilks' $\wedge = .970$; partial $\eta^2 = .015$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the PR subtask and the AQ subscale Imagination, controlling for gender. The means and standard deviations for the PR subtask were male students $M = 3.37$, $SD = 0.56$ and female students $M = 3.51$, $SD = 0.56$. The means and standard deviations for the Imagination subscale were male students $M = 2.93$, $SD = 1.71$ and female students $M = 2.11$, $SD = 1.53$. The difference between the scores, based on gender, was statistically significant, $F(2, 264) = 6.985$, $p = .001$; Wilks' $\wedge = .950$; partial $\eta^2 = .050$. This difference suggests there is a significant dissimilarity between gender on the combined measures of the PR subtask and the imagination subscale. The implications for this significant finding are further explored in Chapter Five.

Research Question 3.14: Emotional Autonomy and Imagination

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Emotional Autonomy (EA) subtask and the *Autism-Spectrum Quotient* subscale Imagination, controlling for class. The means and standard deviations for the EA subtask were first-year students $M = 3.08$, $SD = 0.58$; sophomores $M = 3.25$, $SD = 0.60$; and upper-class students $M = 3.34$, $SD = 0.55$. The means and standard deviations for the Imagination subscale were first-year students $M = 2.18$, $SD = 1.62$; sophomores $M = 2.64$, $SD = 1.54$; and upper-class students $M = 2.00$, $SD = 1.56$. The difference between the scores, based on class, was statistically significant, $F(4, 528) = 3.263$, $p = .012$; Wilks' $\wedge = .952$; partial $\eta^2 = .024$. This difference suggests there is a significant distinction between class on the combined measures of the EA subtask and the imagination subscale, and this dissimilarity is further considered in Chapter 5.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the EA subtask and the AQ subscale Imagination, controlling for gender. The means and standard deviations for the EA subtask were male students $M = 3.07$, $SD = 0.48$ and female students $M = 3.19$, $SD = 0.46$. The means and standard deviations for the Imagination subscale were male students $M = 2.93$, $SD = 1.71$ and female students $M = 2.11$, $SD = 1.53$. The difference between the scores, based on gender, was statistically significant, $F(2, 264) = 7.103$, $p = .001$; Wilks' $\wedge = .949$; partial $\eta^2 = .051$. This difference suggests there is a significant distinction between gender on the combined measures of the EA subtask and the imagination subscale; this finding is explored in Chapter Five.

Research Question 3.15: Interdependence and Imagination

A one-way multivariate analysis of variance explored if there was a relationship between scores on the Interdependence (IND) subtask and the *Autism-Spectrum Quotient* subscale Imagination, controlling for class. The means and standard deviations for the IND subtask were first-year students $M = 2.71$, $SD = 0.62$; sophomores $M = 2.72$, $SD = 0.74$; and upper-class students $M = 2.72$, $SD = 0.70$. The means and standard deviations for the Imagination subscale were first-year students $M = 2.18$, $SD = 1.62$; sophomores $M = 2.64$, $SD = 1.54$; and upper-class students $M = 2.00$, $SD = 1.56$. The difference between the scores, based on class, was not statistically significant, $F(4, 528) = 1.314$, $p = .263$; Wilks' $\wedge = .980$; partial $\eta^2 = .010$.

A one-way multivariate analysis of variance determined if there was a relationship between scores on the IND subtask and the AQ subscale Imagination, controlling for gender. The means and standard deviations for the IND subtask were

male students *M* = 2.62, *SD* = 0.51 and female students *M* = 2.74, *SD* = 0.60. The means and standard deviations for the Imagination subscale were male students *M* = 2.93, *SD* = 1.71 and female students *M* = 2.11, *SD* = 1.53. The difference between the scores, based on gender, was statistically significant, $F(2, 264) = 6.621$, $p = .002$; Wilks' $\wedge = .952$; partial $\eta^2 = .048$. This finding suggests there is a significant difference between gender on the combined measures of the IND subtask and the imagination subscale.

Table 14

Summary Data for Research Question 3 - Class

Variables	*F*	*p*	Wilks' ∧	η^2
PR and Social Skills	1.091	.360	.984	.008
EA and Social Skills	2.004	.093	.970	.015
IND and Social Skills	0.512	.404	.992	.004
PR and Attention Switching	1.147	.333	.983	.009
EA and Attention Switching	2.094	.080	.969	.016
IND and Attention Switching	0.608	.657	.991	.005
PR and Attention to Detail	1.738	.140	.974	.013
EA and Attention to Detail	2.792	.026	.959	.021
IND and Attention to Detail	1.231	.297	.982	.009
PR and Communication	1.134	.340	.983	.009
EA and Communication	2.320	.056	.966	.017
IND and Communication	0.690	.599	.990	.005
PR and Imagination	2.010	.092	.970	.015
EA and Imagination	3.263	.012	.952	.024
IND and Imagination	1.314	.263	.980	.010

Table 15

Summary Data for Research Question 3 - Gender

Variables	*F*	*P*	Wilks' Λ	η^2
PR and Social Skills	2.004	.137	.985	.015
EA and Social Skills	1.989	.139	.985	.015
IND and Social Skills	1.551	.214	.988	.012
PR and Attention Switching	1.611	.202	.988	.012
EA and Attention Switching	1.798	.168	.987	.013
IND and Attention Switching	1.230	.294	.991	.009
PR and Attention to Detail	1.350	.261	.990	.010
EA and Attention to Detail	1.590	.206	.988	.012
IND and Attention to Detail	0.900	.408	.993	.007
PR and Communication	1.903	.151	.986	.014
EA and Communication	2.015	.135	.985	.015
IND and Communication	1.531	.218	.989	.011
PR and Imagination	6.985	.001	.950	.050
EA and Imagination	7.103	.001	.949	.051
IND and Imagination	6.621	.002	.952	.048

Chapter Summary

This chapter provided the results of the analysis of the data collected from a sample of college students' (n = 268) at a large public institution. The responses to demographic information, some *Student Developmental Task and Lifestyle Assessment* subtasks and the *Autism-Spectrum Quotient* were analyzed, and significant findings were

identified for five measures. These significant findings included: there may be as many as 1 in 6 students with the BAP and there is a difference in the psychosocial development between neurotypical and BAP students across three measures: emotional autonomy, interdependence, and peer relationships. Finally, there is a relationship between imagination and emotional autonomy, peer relationships, and interdependence. Attention to detail is also related to emotional autonomy.

CHAPTER 5

DISCUSSION

In this chapter, a summary of the exploratory study, significant findings, limitations, and implications for practice are explored. The discussion concludes with recommendations for further research.

Summary of the Study

The purpose of this study was to explore the psychosocial development of students with the Broader Autism Phenotype (BAP). This study presupposed that in order to understand and help students with the BAP, it was important to understand more about their development as compared to neurotypical students. Three research questions guided this study: (1) what are the demographic characteristics of students with the BAP? (2) is there a difference between the psychosocial development, as measured by the *Student Developmental Task and Lifestyle Assessment* (SDTLA) subtasks, of students with the BAP and neurotypical students? and (3) is there a relationship between the subscale scores on the *Autism-Spectrum Quotient* (AQ) (social skills, attention switching, attention to detail, communication, and imagination) and the students' psychosocial development as measured by the SDTLA subtasks (emotional autonomy, interdependence, and peer relationships)?

An electronic questionnaire collected information from participants regarding their behaviors, preferences, responses to the social environment, and demographics. The questionnaire incorporated aspects of previously tested instruments, including the Emotional Autonomy, Interdependence, and Peer Relationships subtasks from the

SDTLA (Winston, Miller, & Cooper, 1999) and subscales related to social skills, attention switching, attention to detail, communication, and imagination from the AQ (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). Students between the ages of 18 and 25 enrolled in an introductory psychology course at a large, public institution in the Southeast United States were invited to participate in the study by completing an online questionnaire. The survey response rate was approximately 26.8% (n = 268).

Descriptive statistics were used to analyze the first research question about demographic information for students with the BAP. Independent sample t-tests helped the researcher answer the question pertaining to whether there was a difference in psychosocial development between neurotypical students and those with the BAP. Finally, analysis of variance was used to see if there was a relationship between a student's score on the subscales of the AQ and the subtasks of the SDTLA.

Discussion

This study explored the psychosocial development of students with the BAP. Chickering and Reisser's (1993) theory of psychosocial development served as the theoretical framework for the study. Specifically, the study looked at emotional autonomy, peer relationships, and interdependence as defined and measured by the *Student Developmental Task and Lifestyle Assessment* (Winston et al., 1999).

The first research question related to the demographic characteristics of students with the BAP. Findings from this study suggest that one in every six students may have characteristics associated with the Broader Autism Phenotype as 19.6% of students from the respondent group had scores on the AQ that indicated characteristics of BAP.

Additionally, the data analyses employed in the study resulted in several significant findings:

- There is a difference between the psychosocial development, including emotional autonomy, interdependence, peer relationships, of students with the BAP and neurotypical students on three subtasks measured.
- There is a relationship between students' attention to detail and emotional autonomy as well as imagination and emotional autonomy. This relationship is significant when looking through the lens of academic class.
- There is a relationship between imagination and three psychosocial development subtasks, emotional autonomy, interdependence, and peer relationships when looking through the lens of gender, specifically male and female in this study.

Making meaning of these relationships between students' psychosocial development and BAP characteristics can create understanding about these students and thereby influence professional practice for educators and future research directions.

Difference in Psychosocial Development

The second research question in this study sought to determine if there was a difference between the psychosocial development of students with the BAP and neurotypical students. The analysis in Chapter 4 showed a statistically significant difference in the neurotypical and BAP students on all three measures of psychosocial development: emotional autonomy, peer relationships, and interdependence.

Emotional autonomy is a subtask of the SDTLA's Developing Autonomy Task and grounded in Chickering and Reisser's (1993) vector *managing emotions.* When students enter postsecondary education, they often have an inability to control and

express their emotions appropriately (Chickering & Reisser). During the college years, they learn to cope with difficult emotions such as anger, fear and depression. As students develop in this area, they become aware of the feelings they are experiencing and are able to exert control of them. The ability to manage how one feels and demonstrate these emotions in a healthy and appropriate manner are major milestones in this vector. There have been very few studies about how students with the BAP and manage and express their emotions; however, one study found that the BAP was characterized by behavioral rigidity (Wainer, Ingersoll, & Hopwood, 2011). Previous research on Autism Spectrum Disorders found that individuals on the spectrum exhibit rigid behavior and have little emotional expression or have an inability to express their feelings in a meaningful way (Gillberg, 2002). Furthermore, studies on both ASD and BAP have shown that individuals have a difficult time recognizing the facial expressions of others (Farrell, 2004; Ingersoll, 2010). This study coupled with the information from previous research provides us with insights into students with BAP in that they either overly express their emotions or they do not express them in any meaningful manner.

Interdependence is a subtask of the SDTLA's Developing Autonomy Task (Winston et al., 1999) and grounded in Chickering and Reisser's (1993) vector *moving through autonomy towards interdependence.* This vector includes emotional and instrumental independence with interdependence as the capstone of autonomy (Chickering & Reisser). As students move through this vector, they go from emotional dependence and poor self-direction to freedom from reassurance and a recognition and acceptance of the importance of interdependence. Interdependence means that there is a respect for other's autonomy and that relationships are balanced by give and take.

Emotional autonomy measures the degree to which students are free from the need for approval from others, continuous reassurance, and reliance on parents (Winston et al., 1999). Interdependence measures the degree to which students are involved with their community. In a previous study, Glennon (2001) found that independence is often an impossible concept for students with Asperger Syndrome. Furthermore, students with Autism Spectrum Disorders are often dependent on their parents during the post-secondary years (Wolf, Brown, & Bork, 1999). No previous studies were found that directly address interdependence for individuals with BAP. This study showed that students with the BAP fare differently than their neurotypical peers in interdependence; therefore, they may demonstrate stronger characteristic of ASD on this vector. This likely suggests that students with BAP have not developed the skills to balance the give and take in relationships.

Peer Relationships is a subtask of the SDTLA's Mature Interpersonal Relationships Task (Winston et al., 1999) and grounded in Chickering and Reisser's (1993) vector *developing mature interpersonal relationships*. A slower development in this vector would mean that an individual has a lack of awareness and intolerance of differences. Relationships with others are unhealthy. Developing mature interpersonal relationships requires students to develop their intercultural and interpersonal tolerance and appreciate differences. A capacity for intimacy is another aspect of developing mature interpersonal relationships. Through developing a capacity for intimacy, students learn that relationships with others are reciprocal and mutually beneficial. The peer relationships subtask measures the degree to which students can distinguish between friendships and acquaintances, and the degree to which they describe their relationships

as having trust, independence, and individuality (Winston et al.). This study reinforces the work of Jobe and White (2007) who found that students with the BAP reported feeling lonelier at a significant level not because they necessarily preferred to be alone, but rather from their lack of social skills that led to the feelings of loneliness. Sasson, Nowlin, and Pinkham found that BAP traits were associated with social cognition and reduced social skills. It appears that the difference between students with BAP and neurotypicals in terms of peer relationships is derived from the difficulties those with BAP face in their social skills.

The findings in this study support the notion that individuals with BAP demonstrate characteristics of Autism Spectrum Disorders (ASD) as demonstrated by the differences in their results on the Emotional Autonomy, Peer Relationships, and Interdependence subtasks compared to the neurotypical students. Rutter (2011) articulated there was a lack of understanding of how someone with BAP fares in adult life, and this study provides insight. While the behaviors of individuals with the BAP may not reach clinical levels, there is still sufficient evidence in the literature and in the results of this study that both enhance and add to previous research. Students with the BAP fare differently in their psychosocial development than their neurotypical peers in how they manage and express their emotions, interact with others, develop healthy and lasting relationships, and find both independence and interdependence.

Relationships Between Psychosocial Development and Characteristics of the BAP

The study sought to understand if there was a relationship between the subscale scores on the *Autism-Spectrum Quotient* (AQ) and the subtasks on the *Student Developmental Task and Lifestyle Assessment* (SDTLA), which would indicate a possible

relationship between the behaviors associated with each. Academic class and gender helped provide additional meaning. This research question explored 15 possible relationships for both class and gender, and five of them were statistically significant. The first was a statistically significant relationship between emotional autonomy and attention to detail as affected by academic class. Emotional autonomy and its meaning and grounding in psychosocial theory are defined above. The attention to detail subscale measures the level of normality in terms of how someone attends to details. For example, someone with the BAP would have an exceptional attention to detail. Examples of attention to detail statements in the AQ included noticing details others do not, fascination with numbers, and seeing patterns in all things. The finding here shows a relationship between the higher score on attention to detail and a lower score on emotional autonomy by academic class for students with the BAP. This means that when students with the BAP overly focus on details, they may lose sight of how they actually feel. The strong attention to detail is closely aligned with the work by Austin (2004) who found a correlation between higher scores on the AQ and high neuroticism. The result for students with the BAP is not learning how to appropriately control and express their emotions, which further explains and supports why there is a difference between neurotypical and BAP students in their emotional autonomy.

The findings also indicated a relationship between the scores on the AQ subscale for imagination and the subtask Emotional Autonomy for both class and gender differences. When looking at gender, relationships between imagination and the other subtasks of Interdependence and Peer Relationships also appeared. Individuals with the BAP would characteristically exhibit a poor imagination. Communication and

imagination are often interconnected when describing Autism Spectrum Disorders, as individuals with ASD are very literal in their interpretation of words and have difficulty playing pretend with others (Wing, 1996). However, the AQ separates communication and imagination into two subscales, and the analyses in this study showed that imagination was statistically significant in its relationship with emotional autonomy, but not communication. This means that students with the BAP may differ from individuals with ASD in their communication as this area may not manifest itself in students with the BAP. Examples of AQ type statements regarding imagination include picturing images in one's mind, making up stories, reading preferences such as fiction over non-fiction, and imagining what it would be like to be someone else. For traditional-aged college students with the BAP, being imaginative is likely a challenge connected to their difficulty in recognizing their own emotions and/or the emotions of others. This inability to be imaginative seems to offer further perspective and meaning as to why students with the BAP differ from neurotypicals in the three vectors from the work of Chickering and Reisser (1993): managing emotions, moving through autonomy towards interdependence, and developing mature interpersonal relationships.

Psychosocial development theories, including that of Chickering and Reisser (1993), are helpful in understanding the issues individuals face throughout their lives. Development occurs at different stages and effected by various environmental factors, including social norms, society, and culture. One of the cornerstones of psychosocial development is how identity emerges from critical stages of development (Erikson, 1963). There are measures to help us identify students with the BAP, but do the students themselves understand and identify in this manner. As students explore their various

identities during the postsecondary years, such as gender, race, ethnicity, sexual orientation, and many others, this study questions whether this is true for students with BAP. Do they understand that parts of their personality traits are associated with an actual identity? In other words, are students able to articulate who they are in terms of the BAP and understand what this means for them.

Limitations

The study investigated the psychosocial development of students with the BAP, and the data provided initial understanding of these students and should be considered exploratory in nature. Several limitations emerged after data collection and review that should be considered when interpreting the results of this study. Despite the large number of responses (n = 268), only 44 of the students exhibited characteristics of the Broader Autism Phenotype. In order to have a medium effect size, 61 respondents with the BAP were needed. The low number of responses with the BAP detracts from the generalizability of the data.

In addition to the low number of BAP responses, most students were freshmen and sophomores. The highest number of respondents was overwhelmingly first-year students at 62.3%. The sample was recruited through an Introductory Psychology course typically populated by students early in their college careers, and this may account for the high number of first-year students. Inclusion of students in higher-level courses may have produced a greater breadth of academic class representation.

In order to analyze the results, data were collapsed for certain variables. As previously discussed, there were few responses from junior and senior students, so the third research question was analyzed using a collapsed set of data, with first-year students

(62.3%), sophomores (26.9%), and upper-class students (10.8%). The frequencies of responses for the *Autism-Spectrum Quotient* subscales were also collapsed. The response on the subscales influences the overall score on the AQ, which determines if a respondent has characteristics of the BAP. A greater number of responses on both the low and high end of scores affects the overall analysis and determination of whether a relationship existed between the AQ subscales and the SDTLA subtasks.

Finally, the reliability scores for both instruments were relatively low. The reliability scores for the SDTLA subtasks were lower than found in previous research (Winston, Miller, & Cooper, 1999), but still within the medium range. For the AQ, the reliability scores were considerably lower than the previous research (Baron-Cohen, et al., 2001). For example, the previous Cronbach's α for the social skills subscale was .77 and for this study, it was .55. This variation from previously cited reliability scores is likely due to the lower number of BAP student responses in this dataset; however, low reliability scores should be considered when interpreting the results and making any generalizable conclusions.

Implications for Practice

This study presupposed that in order to understand how to help individuals with the Broader Autism Phenotype, it was important to understand how they developed psychosocially in the post-secondary years. According to the findings in this study, one out of every six students may be characteristic of the BAP. This study contributes to the existing body of research explained in Chapter 2 by providing additional information about students with the BAP. As indicated previously, individuals with the BAP do not have a diagnosis and, therefore, typically are not eligible for accommodations at the

university level. Jobe and White (2007) found that students with the BAP needed additional assistance in areas such as maintaining friendships and social communication, and the findings of this study affirm this. There was a statistically significant difference between the BAP and neurotypical students in peer relationships, emotional autonomy, and interdependence; based on these findings, it is important for post-secondary administrators and faculty members to understand that there are students with BAP. The students with BAP are not diagnosable and have characteristics that differentiate them from other students. These characteristics include difficulty managing and expressing their emotions, moving towards interdependence, and developing mature interpersonal relationships. College personnel should keep in mind that there are students with the BAP and it is a possibility that they will have interactions with these students. Understanding the characteristics of students with the BAP helps to frame why students behave a certain way. Knowing more about these students provides a lens to understand certain behaviors and helps to think about how to work with them.

First-year students comprised the highest number of respondents to the study. Assisting the BAP students in their first-year is imperative particularly given the statistically significant between BAP and neurotypical students in emotional autonomy, interdependence, and peer relationships. Unfortunately, providing additional support may be difficult since BAP students do not have a diagnosis or easily visible identifier; however, there are some proactive steps that can be taken to assist these students.

Faculty members who are involved in first-year learning communities, seminars, and courses may use the results of this study to help guide their curriculum. For example, faculty members may infuse additional lessons on interpersonal relationships and

imagination into their courses. Observation of student behavior is often the best indicator, and it is important to note that an official diagnosis is not necessary to address the students. Knowing the characteristics of someone with the BAP will help faculty to recognize potential students with the BAP and potentially provide early support. It is, however, important not to overgeneralize, stereotype, and label students who exhibit difficulties with social interactions. This information can be used to help students as they explore their own identities. Furthermore, it is important to reinforce the idea that there are aspects of behaviors and characteristics that may seem directly associated with Autism Spectrum Disorders, but there is a spectrum and some fall within this spectrum and some are sub-clinical. In the end, it is most important to recognize the breadth of this and provide environments that support the growth of all students.

Creating partnerships with BAP students could be an effective approach to supporting them. The first step in collaborating with BAP students is becoming educated about the population and its characteristics. While disability services staff members and their programs do not have a federally mandated responsibility for students with the BAP, it is advantageous for them to understand these students as well since these students may seek them out for advice. In addition, counseling services staff members would benefit from additional knowledge in preparation to help these students. With proper understanding and training, counseling staff members could form a group designed to help BAP students with their social interactions and relationships with others. Housing professionals can borrow from best practice examples for students with Autism Spectrum Disorders, which include providing students with clear expectations in the beginning of the academic year and encouraging them to complete roommate agreements (Wolf,

Brown, & Bork, 2009). Student life programs and other extra-curricular involvement opportunity services are helpful in creating connections for students with the BAP. For example, peer mentoring is an effective way to help students with the BAP, especially in terms of the psychosocial measures studied here. Since psychosocial development is critical for students between the ages of 17 and 25 specifically, providing support in areas that help students with the BAP would also be beneficial for all students.

This study sought to understand if there was a difference in the psychosocial development of students with the Broader Autism Phenotype. As the findings show, there was a difference in their development as compared to neurotypical students. While psychosocial development theories do not presume one developmental path for all students, evidence shows that individuals experience certain behaviors, tasks, and growth. It is the responsibility of higher education administrators and educators to serve all students on college and university campuses. Just as higher education faculty and administrators over time have learned about students with different abilities, racial backgrounds, sexualities, and religious ties to make appropriate accommodations and create new pathways for those students' success, we are now aware of another population of students – those with the Broader Autism Phenotype – and environments and practices can be reconsidered to support them.

Future Research

This study is exploratory in nature and offers many opportunities for future research. First, researchers who continue to investigate BAP student populations should seek to increase the number of sophomores, juniors, and seniors in a sample. As the research on psychosocial development shows, student development occurs throughout the

college years, largely between the ages of 18-25 (Chickering & Reisser, 1993; Winston et al., 1999). Future studies should also consider looking at students attending various institutional sizes and types. Students self-select their institutions when they apply and this alone can lead to differences in the enrolled student populations between institutions. It would be interested to glean whether there are institutional factors, environmental aspects, or other variables that impact the types of students enrolling at institutions and in this case, particularly students with the BAP.

This study used the *Autism-Spectrum Quotient* (Baron-Cohen et al., 2001) to identify and analyze data on the BAP. As discussed in Chapter 3, two other instruments can be used in future studies, the *Broad Autism Phenotype Questionnaire* (BAPQ) (Hurley et al., 2007) and the *Broader Phenotype Autism Symptom Scale* (BPASS) (Dawson et al., 2005). For the purpose of this study, three of the *Student Developmental Task and Lifestyle Assessment* (SDTLA) subtasks were used. Future research may consider using the full SDTLA or another combination of subtasks in order to determine whether there are any significant differences for students with the BAP on these other measures. The task Establishing and Clarifying Purpose, which includes the subtasks Educational Involvement, Career Planning, Lifestyle Planning and Cultural Participation would be a particularly interesting approach for future studies as these focus different areas than in this study. There was a significant interpersonal dimension to what the current study examined and this Task would provide perspective on the academic experience and future aspirations of students with the BAP.

This study's findings about the relationships between attention to detail and emotional autonomy, and between imagination and all three subtasks provide potential

opportunities for future research. Further study may seek to answer questions about a causal relationship between these measures, and explore if the score on one measure can predict the score on another. If such a relationship exists, this could help to guide how we help students with the BAP. For example, if the score on imagination predicts the score on peer relationships, then there is evidence on that focusing on imagination will potentially help students develop more mature relationships with others.

Qualitative and longitudinal studies may be helpful in understanding more details about the students' experiences in college. A qualitative study could help to provide additional information about the experiences of college students with the BAP; what they feel, think, and experience. Longitudinal studies may provide insight on the full collegiate experiences of students with the BAP. Currently, no study exists that has explored whether the characteristics of the BAP remain the same, change over time, or whether specific interventions make a difference.

The diagnostic criteria for Autism-Spectrum Disorders states that individuals who do not meet the established DSM-V criteria and have marked deficits in social communication should be evaluated for social pragmatic communication disorder (APA, 2013). This researcher did not find any studies on social pragmatic communication disorder and the Broader Autism Phenotype, and such a relationship should be explored through future research.

Summary

This exploratory research study surveyed students between the ages of 18 and 25 enrolled in an introductory psychology course at a large, public institution in the Southeast. The study explored the psychosocial development of students with the

Broader Autism Phenotype, and it serves as a foundation for understanding students with the BAP. The study had several limitations including the sample size of students with the BAP, little variation in class representation, and scale reliability. Analyses of data showed a statistically significant difference between neurotypical students and those with the BAP in emotional autonomy, peer relationships, and interdependence. Furthermore, there was a relationship between the students' scores on emotional autonomy and attention to detail, as well as relationships between imagination and the three subtasks of emotional autonomy, interdependence, and peer relationships. This study is investigative in nature and adds to the growing literature on students with the BAP. The results of this study provide implications for practice and directions for future research.

This study confirms the results of previous research which showed the individuals with BAP lack social skills (Gerdts & Bernier, 2011), feel lonely because of this (Jobe & White, 2007), struggle in recognizing facial expressions (Ingersoll, 2011), exhibit rigid behaviors (Wainer, Ingersoll, & Hopwood, 2011), and have high neuroticism and low extraversion (Austin, 2004). In addition, what I learned about this group of students is that they have difficulty managing and expressing their emotions, moving towards interdependence, and developing mature interpersonal relationships. Furthermore, I confirmed that students with BAP have a strong attention to detail and poor imagination, which provides insight as to their level of psychosocial development. Knowing this information about students with the BAP is important because it provides a lens with which we can think about student behavior. There may be as many as 1 in 6 who have some characteristics of autism, but not at a diagnosable level, and they demonstrate

behaviors which differ from most students in ways that can now be identifiable and help us learn how to better help them be successful.

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APPENDIX A

The Autism Spectrum Quotient (AQ)

1. Definitely disagree
2. Slightly disagree
3. Slightly agree
4. Definitely agree

1. I prefer to do things with others rather than on my own.
2. I prefer to do things the same way over and over again.
3. If I try to imagine something, I find it very easy to create a picture in my mind.
4. I frequently get so strongly absorbed in one thing that I lose sight of other things.
5. I often notice small sounds when others do not.
6. I usually notice car number plates or similar strings of information.
7. Other people frequently tell me that what I've said is impolite, even though I think it is polite.
8. When I'm reading a story, I can easily imagine what the characters might look like.
9. I am fascinated by dates.
10. In a social group, I can easily keep track of several different people's conversations.
11. I find social situations easy.
12. I tend to notice details that others do not.
13. I would rather go to a library than a party.
14. I find making up stories easy.
15. I find myself drawn more strongly to people than to things.
16. I tend to have very strong interests, which I get upset about if I can't pursue.
17. I enjoy social chit-chat.
18. When I talk, it isn't always easy for others to get a word in edgeways.
19. I am fascinated by numbers.
20. When I'm reading a story, I find it difficult to work out the characters' intentions.
21. I don't particularly enjoy reading fiction
22. I find it hard to make new friends.
23. I notice patterns in things all the time.

24. I would rather go to the theatre than a museum.
25. It does not upset me if my daily routine is disturbed.
26. I frequently find that I don't know how to keep a conversation going.
27. I find it easy to "read between the lines" when someone is talking to me.
28. I usually concentrate more on the whole picture, rather than the small details.
29. I am not very good at remembering phone numbers.
30. I don't usually notice small changes in a situation, or a person's appearance.
31. I know how to tell if someone listening to me is getting bored.
32. I find it easy to do more than one thing at once.
33. When I talk on the phone, I'm not sure when it's my turn to speak.
34. I enjoy doing things spontaneously.
35. I am often the last to understand the point of a joke.
36. I find it easy to work out what someone is thinking or feeling just by looking at their face.
37. If there is an interruption, I can switch back to what I was doing very quickly.
38. I am good at social chit-chat.
39. People often tell me that I keep going on and on about the same thing.
40. When I was young, I used to enjoy playing games involving pretending with other children.
41. I like to collect information about categories of things (e.g. types of car, types of bird, types of train, types of plant, etc.).
42. I find it difficult to imagine what it would be like to be someone else.
43. I like to plan any activities I participate in carefully.
44. I enjoy social occasions.
45. I find it difficult to work out people's intentions.
46. New situations make me anxious.
47. I enjoy meeting new people.
48. I am a good diplomat.
49. I am not very good at remembering people's date of birth.
50. I find it very easy to play games with children that involve pretending.

APPENDIX B

Student Development and Lifestyle Assessment (SDTLA)

Respond to each item by marking
1 = True
2 = False

1. It's important to me that I be liked by everyone.
2. Since beginning college, my friends have become more frequent sources of support than my parents.

Respond to the following with the appropriate letter
A = Never (almost never) true of me
B = Seldom true of me
C = Usually true of me
D = Always (almost always) true of me

3. It bothers me if my friends don't share the same leisure interest as I have.
4. I have made conscious efforts to make this college a better place to attend.
5. When I wish to be alone, I have difficulty communicating my desire to others in a way that doesn't hurt their feelings.
6. My classmates can depend upon me to help them master class materials.
7. Because of my friends' urgings I get involved in things that are not in my best interest.
8. It's more important for me to make my own decisions than to have my parents' approval.
9. I conceal some of my talents or skills so I will not be asked to contribute to group efforts.
10. It's more important to me that my friends approve of what I do than it is for me to do what I want.
11. When in groups, I present my ideas and views in a way that it's clear I have given them serious thought.
12. I accept criticism from friends without getting upset.
13. I find it difficult to accept some of the ways my close friends have changed over the past year.
14. I have difficulty following through with decisions I have made when I discover others (e.g., parents or friends) disagree with these decisions.
15. I do not socialize with people of whom my friends don't approve.
16. I feel confident in my ability to accomplish my goals.

17. I try to dress so that I will fit in with my friends.
18. It's essential that those important to me approve of everything I do.

Respond to each item by indicating:
A = Strongly Agree
B = Agree
C = Disagree
D = Strongly Disagree

19. Society has a responsibility to assist people who cannot sustain themselves
20. As a citizen I have the responsibility to keep myself well-informed about current issues.

Respond to each item by indicating:
A = Never
B = Seldom
C = Sometimes
D = Often

21. I wonder what my friends say about me behind my back.
22. Within the past year, I have participated in activities that directly benefited my fellow students.
23. I am confident in my ability to make good decisions on my own.
24. I participate in community service activities.
25. I trust the validity of my values and opinions, even when they aren't shared by my parent(s).
26. I have an inner sense of direction that keeps me on track, even when I am criticized.
27. I feel anxious when confronted with making decisions or taking actions for which I am responsible.
28. I meet my responsibilities to my parents as well as I should.
29. Within the past twelve months, I have taken a public stand on issues or beliefs when many friends and acquaintances didn't agree.

Circle the one best response

30. After a friend and I have a heated argument, I will
    A. Never (almost never speak to him/her)
    B. Seldom speak to him/her
    C. Usually speak to him/her
    D. Always speak to him/her
    E. I never have disagreements with my friends

31. When faced with important decisions this year, I have
    A. relied on others – such as parent(s), friend(s), or teacher(s) – to tell me

what to do
B. sought information and opinions, but made the final decisions on my own
C. relied on myself alone in making the decisions
D. attempted to avoid making decisions as much as possible

32. I have identified, and can list, at least three ways I can be an asset to the community.
A. No, I haven't thought about that much.
B. No, I don't know what I can contribute
C. No, that's not important to me
D. Yes

33. When I have heated disagreements with friends about matters such as religion, politics, or philosophy I . . .
A. am likely to terminate the friendship
B. am bothered by their failure to see my point of view but hide my feelings
C. will express my disagreement, but will not discuss the issue
D. will express my disagreement and am willing to discuss the issue
E. don't talk about controversial matters

34. I have made a positive contribution to my community (residence hall, campus, neighborhood, or hometown) within the past three months.
A. No, that isn't important to me.
B. No, I don't know what I could do to make a positive contribution
C. No, but I have tried to find ways
D. Yes

35. When I don't agree with someone in authority (e.g., professor, administrator), I . .
A. Never express my opinion
B. Express my opinion only when I am angry
C. Express my opinion when asked
D. Express my opinion if given a chance
E. Avoid dealing with persons in positions of authority if possible

36. Within the past twelve months, I have taken an active part in a recycling activity/program.
A. No, recycling is too much trouble.
B. No, I don't know where to dispose of materials.
C. Yes, I have participated occasionally.
D. Yes, I have participated regularly.

E. Yes, I have participated and promoted recycling activities to others.

37. With the past month,
    A. I took the initiative to bring several people together to resolve a mutual problem.
    B. I joined with several people to resolve a mutual problem.
    C. I have not encountered a problem that needed a group effort to solve.
    D. I have avoided situations that required me to work with other people in solve problems.

38. If I thought my friends would disapprove of a decision I made, I would most likely . . .
    A. Try to keep them from finding out (keep it secret).
    B. Tell them and pretend I didn't care what they thought.
    C. Tell them and explain my reasoning for this decision
    D. Make up something to mislead them from knowing the truth.

39. In the past twelve months, I have taken an active part in activities or projects designed to improve the community, such as a charity drive, clean up campaign, or blood drive.
    A. Never
    B. Once
    C. Twice
    D. Three times
    E. Four or more times

40. In regards to social issues, (e.g., homelessness, environmental pollution, or AIDS),
    A. I don't think much about them.
    B. I am concerned, but haven't taken any specific actions.
    C. I contribute money to organizations that address the issue
    D. I am actively involved in organizations that address the issues.

41. Within the past twelve months, I contributed my time to a worthy cause in my community (campus or town/city).
    A. No
    B. 1-10 hours
    C. 11-20 hours
    D. 21-30 hours

APPENDIX C

Demographics

1. What is your gender?
    a. Female
    b. Male
    c. Transgender

2. What is your age?
    a. 18
    b. 19
    c. 20
    d. 21
    e. 22
    f. 23
    g. 24
    h. 25
    i. Other

3. What is your current class standing?
    a. Freshman/first-year
    b. Sophomore
    c. Junior
    d. Senior
    e. 5th year and beyond

4. What is your Race/Ethnicity?
    a. African American/Black
    b. American Indian/Alaska Native
    c. Asian American/Asian
    d. Latino/Hispanic
    e. Middle Eastern
    f. Multiracial
    g. White/Caucasian
    h. Race/Ethnicity not included above

5. What is your major?

    _____

APPENDIX D

Consent Letter

Dear student:

I am a doctoral candidate in the Counseling and Student Personnel Services program conducting research for a dissertation under the direction of Dr. Diane Cooper at the University of Georgia. We invite you to participate in a research study to understand the relationship between psychosocial development and the broader phenotype in college students. The purpose of the study is to see how social skills, attention switching, attention to detail, communication and/or imagination impact a student's psychosocial development. In order to make this study a valid one, some information about the study will be withheld until completion of the study.

In order to participate in the study, students must be 18 – 25 years of age.

Your participation will involve responding to an electronic questionnaire about your behaviors, preferences, and response to the social environment. The questionnaire should take no more than 30 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled. Once submitted, there will be no way to identify your responses and thus the researcher will be unable to redact them from the data set. However, you can, at any point before submitting your responses, choose to discontinue your participation in the study.

With the Internet, your confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties. The questionnaire does not ask for any individually identifiable information on the data received by the researchers from the online host, and the responses will not include your IP address. The results of the research study may be published, but your name or any identifying information will not be used. In fact, the published results will be presented in summary form only.

The findings from this project may provide information that will guide programs and services for students with certain characteristics and the way they interact with the social environment. There are no known risks or discomforts associated with this research, but you may discontinue your involvement in this research study any time prior to submitting your responses on the online questionnaire. You may also choose to skip any question you are not comfortable answering.

By participating in this study, you will one half credit towards your research experience requirement for PSYC 1101. Your involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled. If you do not want to participate in this study, you may see your course instructor for a non-research alternative for receiving credit that will be both comparable in time and effort.

If you have any questions about this research project, please feel free to call (678) 797-2263 to speak with Jennifer Wells, or email her at jbwells@uga.edu.

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Address questions or problems regarding these activities to the Institutional Review Board, Kennesaw State University, 1000 Chastain Road, #0112, Kennesaw, GA 30144-5591, (678) 797-2268 or The Chairperson, University of Georgia Institutional Review Board, 609 Boyd GSRC, Athens, Georgia 30602; telephone (706) 542-3199; email address irb@uga.edu.

By clicking the "I consent to participate" button and completing this questionnaire, you are agreeing to participate in the above described research project. Thank you for your consideration, and please print a copy of this page for your records.

Sincerely,
Jennifer Wells, Doctoral Candidate
jbwells@uga.edu
(678) 797-2263

Diane Cooper, Professor
dlcooper@uga.edu
(706) 542-1812
The University of Georgia
Department of Counseling and Human Development Services

☐ I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.

☐ I do not agree to participate and will be excluded from the remainder of the questions.

APPENDIX E

Debriefing Form

Title: The relationship between psychosocial development and the broader autism phenotype in college students

Thank you for agreeing to participate in this study! The general purpose of this research is to explore the relationship of college students with characteristics of the broader autism phenotype and their psychosocial development. The broader autism phenotype describes individuals with mild autistic-like traits in the typical population. These individuals have normal intelligence and may exhibit traits found on the autism spectrum, including social, communication, and language difficulties, but are not qualified for an autism spectrum diagnosis. Psychosocial development refers to how human beings develop and learn life skills through social, cultural, and environmental interactions.

We invited students between the ages of 18-25 to participate in the study and who were enrolled at Kennesaw State University in the Introductory to Psychology course. The experimenter does not know if you have the characteristics of the broader autism phenotype. In this study, you were asked to respond to questions about your behaviors, preferences, and responses to the social environment. The researchers did not include information about the broader autism phenotype in the invitation to participate or the consent form. This was done to preserve the results of the study. The term autism caries certain understanding and the researchers did not want bias to compromise the results. In addition, the researchers would like to reinforce that participation in this study does not equate to any type of diagnosis at all. The results from this study will help to inform institutions of higher education about the extent to which students embody the characteristics of the broader autism phenotype and whether there are differences in the way students' development.

After learning more about this study, you have the opportunity to withdraw your participation and remove your data from analysis. Should you decide to withdraw from the study, you will still receive the half-credit towards your research requirement.

___ I give permission for my responses to be used in the analysis for this experiment.

___ I do NOT give my permission for my responses to be used in the analysis for this experiment. Please withdraw them from the study and destroy them immediately.

If you feel especially concerned about this study, please feel free to phone Jennifer Wells at (678) 797-2263. In addition, you may contact Counseling and Psychological Services at Kennesaw State University at (770) 423-6600 about options for counseling.

Thank you for your participation in this study. If you have further questions about the study, please contact Jennifer Wells at (678) 797-2263. In addition, if you have any concerns about any aspect of the study, you may contact to The Chairperson, University of Georgia Institutional Review Board, 609 Boyd GSRC, Athens, Georgia 30602; telephone (706) 542-3199; email address irb@uga.edu.

APPENDIX F

IRB Approval – University of Georgia

May 7, 2014

Dear Diane Cooper:

On 5/7/2014, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The relationship between psychosocial development and the broader autism phenotype in college students
Investigator:	Diane Cooper
IRB ID:	STUDY00000921
Funding:	None
Grant ID:	None

The IRB approved the protocol from 5/7/2014 to 5/6/2015 inclusive. Before 5/6/2015 or within 30 days of study closure, whichever is earlier, you are to submit a continuing review with required explanations. You can submit a continuing review by navigating to the active study and clicking Create Modification / CR.

If continuing review approval is not granted before the expiration date of 5/6/2015, approval of this study expires on that date.

Note: Please upload a copy of the KSU IRB approval letter to the study workspace using the Comment function when this becomes available.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103).

Sincerely,

Larry Nackerud, Ph.D.
University of Georgia
Institutional Review Board Chairperson

APPENDIX G

IRB Approval – Kennesaw State University

From : zieglerirb@kennesaw.edu
Subject : Study 15-028: The relationship between psychosocial development and the broader autism phenotype in college students
To : jwells42@kennesaw.edu
Cc : zieglerirb@kennesaw.edu

7/26/2014

Jennifer Wells
KSU

Re: Your application dated 7/22/2014, Study #15-028: The relationship between psychosocial development and the broader autism phenotype in college students

Dear Ms. Wells:

Your application has been reviewed by IRB members. Your study is eligible for expedited review under the FDA and DHHS (OHRP) designation of category 7 - Individual or group characteristics or behavior.

This is to confirm that your application has been approved. The protocol approved is Online survey of psychosocial development and indicators of broader autism phenotypes. The consent procedure described is in effect.

You are granted permission to conduct your study as described in your application effective immediately. The IRB calls your attention to the following obligations as Principal Investigator of this study.

1. The study is subject to continuing review on or before 7/26/2015. At least two weeks prior to that time, go to http://www.kennesaw.edu/irb/forms/progress_report.html to submit a progress report. Progress reports not received in a timely manner will result in expiration and closure of the study.

2. Any proposed changes to the approved study must be reported and approved prior to implementation. This is accomplished through submission of a progress report along with revised consent forms and survey instruments.

3. All records relating to conducted research, including signed consent documents, must be retained for at least three years following completion of the research. You are

responsible for ensuring that all records are accessible for inspection by authorized representatives as needed. Should you leave or end your professional relationship with KSU for any reason, you are responsible for providing the IRB with information regarding the housing of research records and who will maintain control over the records during this period.

4 . Unanticipated problems or adverse events relating to the research must be reported promptly to the IRB. See http://www.kennesaw.edu/irb/reporting-unanticipated-problems.html for definitions and reporting guidance.

5. A final progress report should be provided to the IRB at the closure of the study. Contact the IRB at irb@kennesaw.edu or at (678) 797-2268 if you have any questions or require further information.

Sincerely,

Christine Ziegler, Ph.D.
KSU Institutional Review Board