

UCLA

UCLA Electronic Theses and Dissertations

Title

Self-reported Experiences of Students with Autism Spectrum Disorder in Higher Education: A Population-based Sample

Permalink

<https://escholarship.org/uc/item/0sf796db>

Author

Baczewski, Lauren Marie

Publication Date

2020

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Self-reported Experiences of Students with Autism Spectrum Disorder in Higher Education:

A Population-based Sample

A thesis submitted in partial satisfaction

of the requirements for the degree Master of Arts in Education

by

Lauren Marie Baczewski

2020

© Copyright by

Lauren Marie Baczewski

2020

ABSTRACT OF THE THESIS

Self-reported Experiences of Students with Autism Spectrum Disorder in Higher Education:
A Population-based Sample

by

Lauren Marie Baczewski

Master of Arts in Education

University of California, Los Angeles, 2020

Professor Connie L. Kasari, Chair

Postsecondary education functions as the gateway to a host of positive adult outcomes, including financial independence, employment opportunities, and independent living. Despite this fact, few young adults with autism spectrum disorder (ASD) attend and remain enrolled in higher education. There is an urgent need for studies that better characterize college students with ASD using population-based samples. The current study examines the self-reported experiences of 206 college freshmen (N=103 students with self-identified ASD) who participated in a national survey at the end of their freshman year. ASD and no-ASD groups were matched on demographic characteristics and compared on domains of psychological stress, social self-confidence, connection to campus, self-regulated learning, and campus service use. Students with ASD reported significantly higher levels of psychological stress and significantly lower

levels of social self-confidence compared to neurotypical peers. On all other domains, students with ASD were similar to their typically-developing counterparts. Findings have implications for the development of services and programs at higher education institutions that support all students.

The thesis of Lauren Marie Baczewski is approved.

Jeffrey J. Wood

Carola E. Suárez-Orozco

Connie L. Kasari, Committee Chair

University of California, Los Angeles

2020

This thesis is dedicated to my cousin, Ellen. With gratitude for my quarantine-mates, family, and friends—I couldn't have done it without you. Special thanks to Kyle Sterrett and Alex Sturm for your guidance and support.

Table of Contents

Abstract.....	ii
Dedication.....	v
Introduction.....	1
Literature Review.....	3
Study Aims.....	11
Methods.....	13
Participants.....	13
Measures.....	15
Analyses.....	17
Results.....	18
Discussion.....	20
References.....	26
Appendix.....	31

List of Tables

Table 1. Demographic Characteristics of Sample by Diagnostic Group

Table 2: Estimated marginal means (based on construct sum scores) by diagnostic group and gender, controlling for year of survey form.

Table 3. Results of ANOVA examining impact of diagnostic group and gender on social self-confidence

Table 4. Results of ANOVA examining impact of diagnostic group and gender on psychological stress.

Table 5. Results of ANOVA examining impact of diagnostic group and gender on sense of belonging.

Table 6. Results of ANOVA examining impact of diagnostic group and gender on college satisfaction.

Table 7. Results of ANOVA examining impact of diagnostic group and gender on campus service use.

Table 8. Results of ANOVA examining impact of diagnostic group and gender on academic engagement.

Table 9. Results of ANOVA examining impact of diagnostic group and gender on academic disengagement.

Rates of higher education attendance in the United States have steadily increased over the course of the past several decades (Belch, 2004). Notably, enrollment rates have climbed for both students with and without disabilities (Belch, 2004; Roux, Shattuck, Rast, Rava, & Anderson, 2015; Sanford et al., 2011). Several decades of landmark legislation such as the Americans with Disabilities Act of 1990 and the Individuals with Disabilities Education Act (IDEA) paved the way for students with disabilities to access postsecondary education opportunities that were previously unobtainable (Belch, 2004). Despite this increased access to enrollment, students with disabilities have markedly lower retention and graduation rates than their peers without disabilities, which significantly impacts their ability to obtain employment and gain financial independence later in life (McGregor et al., 2016; Sanford et al., 2011). In addition to job access and financial stability, postsecondary education is linked to a host of positive outcomes in adulthood, including a greater likelihood to live independently and to report psychological wellbeing (Roux, Shattuck, Rast, Rava, & Anderson, 2015; Sanford et al., 2011). It is therefore critical that we better understand how to support the enrollment and retainment of students with disabilities in higher education. In pursuit of this aim, studies that examine the self-reported college experiences of students with disabilities are essential.

Over the course of the next decade, a half million young adults with Autism spectrum disorder (ASD) will enter adulthood and very few will go on to pursue postsecondary education (Roux, Shattuck, Rast, Rava, & Anderson, 2015). Only 36% of young adults with a diagnosis of ASD attend higher education, compared to 65-69% of neurotypical peers (Roux et al., 2015). As an increased number of young adults with disabilities enroll in college, large-scale research on their self-reported experiences will inform institutions on how to best support all of the students on their campuses.

Available data shows that students with ASD typically report lower self-esteem and peer acceptance, as well as greater social isolation than their neurotypical peers (Maag & Reid, 2006; Sparks & Lovett, 2009). Despite this fact, few studies employing population-based samples have examined factors related to psychological health among college students with autism (Gelbar et al., 2014; Jackson et al., 2018). Research is urgently needed in this area as over 47% of young adults with ASD endorse feelings of depression compared to 15.6% of neurotypical peers (Roux et al., 2015).

The dearth of research on the self-reported experiences of students with ASD in college necessitates further exploration of these experiences and how they may impact retention and success in school. Students with ASD often have challenges in the area of social integration and self-confidence, which may greatly impact their engagement with their college campuses. Engagement with one's college campus is linked to numerous positive academic and social outcomes, including increased retention, persistence, and higher self-rated quality of life (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). Furthermore, feeling connected to the campus community is related to lower levels of depressive symptoms and anxiety in college students (Lee et al., 2014). It is imperative that we better understand whether students with ASD feel a sense of belonging to their campus community, how they interact with said community, and how satisfied they are with their college experiences.

The present study used data from a national survey of 2 and 4-year college students to characterize a population-based sample of students with ASD and a matched sample of typically-developing students on domains of social self-confidence, psychological stress, self-regulated learning, campus service use, and connection to campus. Additionally, this study explored group differences between the ASD and neurotypical groups on each domain of interest at the end of

the students' first year of college. This study contributes to the growing body of work on the experiences of college students with autism. Implications are discussed, with a focus on how these results may be applied to the development of targeted, meaningful supports and services on college campuses.

Literature Review

The Growing Population of Young Adults With ASD

One in 62 children in the U.S. has an autism spectrum disorder, and autism continues to affect these children as they develop and grow (National Institute of Mental Health, 2016).

Although the majority of ASD research is focused on children with the diagnosis (U.S. Department of Health and Human Services, 2017), autism affects individuals throughout the lifespan and across development (National Institute of Mental Health, 2016). Each year 50,000 individuals with ASD complete high school in the United States, and that number is growing (Roux et al., 2015). Despite these increasing numbers, there is a paucity of research on young adults with ASD and their experiences after high school (Roux et al., 2015; Shattuck et al., 2014).

Studies that do examine the experiences of young adults with ASD rarely include population-based samples and report on adult outcomes (U.S. Department of Health and Human Services, 2017). According to a recent report to Congress on the progress of the 2014 Autism Cares Act, current population-level data on emerging adults ends at age 25, was collected across multiple different studies, and does not capture the individual variability of those surveyed (U.S. Department of Health and Human Services, 2017). This gap in research is underscored by the recent National Autism Indicators Report which notes that currently available large-scale data sets capture only those with autism who qualify for special education services under the

Individuals with Disabilities Education Act (IDEA). Therefore, available data likely falls short of capturing individuals with autism who are higher functioning and may not qualify for special education services (Roux et al., 2015).

In addition to the evident lack of population-based data on young adults with ASD, there is a paucity of research on the experiences of individuals and their families as they transition to adulthood (Roux et al., 2015). Although more than \$342 million in private and federal funds went towards autism research in 2015, only 2% of that amount was used to study lifespan/transition-related issues (U.S. Department of Health and Human Services, 2017). Subsequently, much is still unknown about options for individuals with ASD after high school and supports or services that may contribute to their success in environments such as college.

Transition to Adulthood in Autism: A Need for Research on This Life Stage

The transition to adulthood or Emerging adulthood (EA) period occurs from the late teens to the mid-twenties. During this life stage, individuals are faced with a myriad of changes, transitions, and opportunities as they seek to find their place in the adult world (Arnett, 2000). Characterized by role exploration and an uncertainty of what is to come, EA is conceptualized by some as its own developmental stage (Arnett, 2000). The pervasive change that occurs during EA can be stressful and daunting for many, and a person's resilience in the face of transition can be largely impacted by their individual characteristics, resources, and their interactions with their surrounding environment (Wood et al., 2018).

Emerging adulthood can be particularly complex for individuals with ASD, as the transition often comes with the loss of previously held services and drastic changes in lifestyle or routine (American Academy of Pediatrics, American Academy of Family Physicians, and American College of Physicians, Transitions Clinical Report Authoring Group, 2011; Betz,

2007; Wood et al., 2018). In addition to facing continued challenges associated with ASD, emerging adults with the diagnosis confront a host of new challenges as they pursue postsecondary opportunities. As a result of these compounding factors, many emerging adults with disabilities need increased supports around the transition to adulthood, yet services in this area are markedly lacking (Wood et al., 2018). In the case of ASD in particular, growing prevalence rates render the lack of support around the transition to adulthood a critical area for further study.

Postsecondary Options for Young Adults with ASD

Postsecondary education attendance is associated with a greater likelihood of securing employment, of being healthy, living independently, and achieving financial independence (Jackson, Hart, & Volkmar, 2018; Roux et al., 2015; Sanford et al., 2011). Despite this fact, only one third of young adults with ASD attend postsecondary education of any kind after high school and slightly over half report having paid employment between high school and their early 20s (Roux et al., 2015). Postsecondary enrollment rates among high school graduates at large typically fall between 65-69% (National Center for Education Statistics, 2017). Compared to young adults with other kinds of disabilities, individuals with ASD are significantly less likely to attend postsecondary education and obtain employment (Shattuck et al., 2012). Several factors may contribute to the discrepancy of young adults with ASD in postsecondary education and employment, including the lack of sufficient services and supports after high school (Roux et al., 2015). Families of young adults with ASD often describe transitioning out of high school to be equivalent to “falling off a services cliff”, as the services that were previously available through the school system are no longer provided (Roux et al., 2015; Shattuck et al., 2012).

The Individuals with Disabilities and Education Act (IDEA) federally mandates that the special education system construct a post high school plan before a child with a diagnosed disability turns 16 years old (Powers et al., 2005). As reported by special education teachers, only 58% percent of young adults with ASD have an initiated transition plan by 16 years old (Roux et al., 2015). Given that transition plans are provided through the special education system and require a documented diagnosis, many of the highest functioning students with ASD may not receive any supports from their schools regarding postsecondary options. In addition to the lack of effective transition planning, there are very few available programs and evidence-based practices that support transition to higher education for students with autism (Roux et al., 2015; Shattuck et al., 2012). Transition supports are lacking and as the number of young people with autism in the U.S. grows, high schools and colleges need more information on how to support their students. The present study explores self-reported experiences of students with autism who have just completed their first year of college, a year that may be critical in determining students' desire to remain enrolled.

Characterizing Students with ASD in Higher Education

Results from one of the few large-scale studies of U.S. special-education users in existence provides a snapshot of characteristics that are common amongst the one third of individuals with autism who attend postsecondary education (Roux et al., 2015). Of those who went on to attend college for any amount of time, the majority attended 2-year colleges (70%) while it was rarer to attend a 4-year college, vocational/technical school, or both 2 and 4-year colleges (Roux et al., 2015). Out of all those with ASD surveyed who attended postsecondary school, the majority were White, from higher socioeconomic backgrounds, had a parent who attended some higher education, and had no trouble conversing (Roux et al., 2015).

Importantly, the disclosure of one's diagnosis appears to be critical for obtaining services of any kind on college campuses for students with ASD (Gelbar et al., 2014; McGregor et al., 2016; Shattuck et al., 2014). Forty percent of students with autism who choose to disclose their diagnosis report receiving help or support from their institution (Roux et al., 2015). Data from the National Longitudinal Transition Study 2 (NLTS-2) demonstrates that one third of college students with ASD who have received special education services at some point during their lifetime do not report themselves as having a disability or special need (Shattuck et al., 2014). This rate demonstrates the evident need for data on college students with ASD that is more representative of the larger population enrolled in higher education, many of whom may not be identified in survey data obtained via the special education system or from a clinic-based sample. The current study addresses this gap by examining experiences of a non-clinically referred sample of college students with ASD who self-disclose their diagnosis.

A Need to Identify Subjective Experiences of College Students on the Autism Spectrum

Recent papers call for more studies that examine the subjective experiences of individuals on the spectrum while in college (see Gelbar et al., 2014 for a review; e.g. Jackson, Hart, Brown, et al., 2018; Roux et al., 2015). One method for obtaining this information is via qualitative work that centers the voices of individuals with ASD and their families (Gelbar et al., 2014). For example, Cai and Richdale conducted 15 semi-structured focus groups with college students with ASD and their family members or parents (Cai & Richdale, 2016). Focus group participants stated the importance of diagnosis disclosure for the obtainment of services and emphasized that most students with ASD felt supported academically but not socially but their institutions. In the absence of sufficient support from the school, parents and relatives reported providing substantial adaptive-living and social skill supports to their loved one with ASD (Cai &

Richdale, 2016). Studies like Cai and Richdale's that utilize qualitative methods to explore experiences of young people with ASD are critical. Alongside that work, larger-scale studies of population-based samples will provide a meaningful contribution to the growing knowledge base in this area.

A 2014 systematic review of studies that include young adults with ASD called for an increase in survey research that may provide a larger-scale view of the subjective, self-reported experiences of individuals with ASD in higher education (Gelbar et al., 2014). Taken together, findings from survey studies and qualitative reports may allow for increased breadth and depth of understanding of the experiences of students with ASD in higher education contexts. This increased understanding will prove critical in identifying campus supports most desired by this population, which can then guide future intervention efforts (Farley et al., 2009; Newman et al., 2011; Roux et al., 2015).

Mental Health Characteristics of College Students with ASD

Currently-available data estimates that approximately 70% of youth with autism have at least one comorbid psychiatric disorder and 41% have two or more co-occurring conditions (Simonoff et al., 2008). A recent survey of 56 adults enrolled in postsecondary education in the U.S. reports that 57.1% of respondents self-identified as having at least one co-occurring psychiatric diagnosis during their time at school (Jackson, Hart, Brown, et al., 2018). Of this same sample, 35.7% of students self-identified as having depression, 42.9% felt isolated at school, and 74.6% reported having some type of suicidal ideation during their lifetime (Jackson, Hart, Brown, et al., 2018). Comparatively, large-scale surveys of college students in the U.S. report rates of depression at 15.6% and suicidal ideation as endorsed by 2% of those sampled (Eisenberg et al., 2007). The alarmingly high presence of mental health comorbidity and suicidal

ideation among youth with ASD illustrates the urgent need for college campus supports and services that are tailored to the unique needs of this population (Jackson, Hart, Brown, et al., 2018; Jackson, Hart, & Volkmar, 2018). In order to identify institutional supports that may benefit this population, it is imperative that we gain a greater understanding of how students with ASD participate in their campus communities, whether they feel satisfied with their college experience, and how psychological health and self-beliefs impact their motivation to engage (Jackson, Hart, Brown, et al., 2018; Roux et al., 2015). Due to the fact that young adults with ASD are at a higher risk for negative mental health outcomes than same-aged peers without ASD, it is expected that students with ASD in the present study will report higher levels of psychological stress in comparison to their matched neurotypical peers.

Self-reported Social Self-confidence

Social self-confidence may influence both students' mental health status and motivation to engage with the campus community. Several terms are common in the literature to refer to self-beliefs regarding one's social competence (Vickerstaff et al., 2007). The present study uses the term "social self-confidence" to refer to a person's self-rated social skills and comfort in social settings. Many young adults with autism report awareness of a difference in social skills or abilities in comparison to same-aged peers without a diagnosis of ASD (Van Hees et al., 2015). Given the social communication challenges commonly associated with autism, it is important to examine how college students with ASD rate their own confidence and comfort in social settings.

Extant research shows that children with ASD report lower levels of self-reported social competence compared to neurotypical peers, and that lower levels of confidence are related to higher depressive symptomatology (Vickerstaff et al., 2007). Self-reported ratings of social self-

confidence have not yet been reported in a study of college students with autism. Examining social self-confidence among a college-aged, population-based sample of young people with ASD will allow future research to examine the relationship between social confidence and mental health or campus engagement outcomes. Research shows that among neurotypical college students, lower social self-confidence is related to higher risk for depression, and depression is associated with disengagement from one's social networks and communities (Armstrong & Oomen-Early, 2009; Williams & Galliher, 2006). Therefore, it is critical that we cultivate a better understanding of how college students with ASD are feeling about their social skills in the campus context.

Engaging with & Connecting to College Campus

Feeling a sense of belonging to one's college campus is related to higher retention, academic perseverance, and emotional well-being within the neurotypical student population (Braxton & McClendon, 2001; Kuh et al., 2008). Research shows that students with ASD are less likely to complete their degree compared to students from the general population and those with other kinds of disabilities (Newman et al., 2011). Thus, it is critical that we better understand both factors that impact campus engagement and how engagement may impact the experiences of students on the spectrum in college. In order to do so, we must first identify factors that contribute to engagement with one's campus and determine whether students with ASD and without ASD differ in this domain.

Currently-available data on college students with ASD reports that students on the spectrum report high rates of isolation at school and difficulty integrating into their campus environments (Jackson, Hart, Brown, et al., 2018). Among neurotypical college students, a lack of engagement with one's surrounding community is linked to depressive symptoms, and vice

versa (Lee et al., 2014; Williams & Galliher, 2006). Given the high rates of self-reported depression in college students with ASD (Jackson, Hart, Brown, et al., 2018), it is important to examine the engagement of these students on their campuses. A greater understanding of the experiences of college students with ASD may facilitate the creation of research-informed, critically-needed support services and programs on college campuses.

Study Aims

The present study utilized quantitative survey methodology to examine the self-reported experiences of college students with ASD, and a demographically-matched sample of students without ASD. Few studies have used survey methods to collect information on this population to date (Gelbar et al., 2014) and of those, samples typically include 60 participants or less (e.g. Elias & White, 2018; Gelbar, Shefcyk, & Reichow, 2015; Jackson, Hart, Brown, et al., 2018; White et al., 2016). The current study examined the self-reported experiences of 206 college students (N=103 with self-identified ASD) attending higher education institutions across the United States. College freshmen with ASD were compared to a matched group of students who do not identify as having a disability on the domains of self-regulated learning, connection to campus, self-advocacy, psychological stress, and social self-confidence as rated at the end of their freshman year of college.

Hypotheses

Students with ASD are expected to report significantly lower levels of social self-confidence, higher degrees of psychological stress, a lower sense of belonging to their institution, and more satisfied feelings towards their campus at the end of freshman year in comparison to neurotypical matched peers. Additionally, I predict that students with ASD will report

significantly higher levels of self-advocacy behaviors (service use) and more self-regulated learning behaviors (i.e. academic engagement) than neurotypical matched peers.

Guiding Theory & Framework

Student Engagement Theory posits that a person's path through higher education is non-linear and shaped by a number of different factors including student background and pre-college experiences, student behaviors (e.g. peer involvement, motivation, interaction with faculty), and institutional conditions (e.g. teaching approaches, first year experience, campus environment) (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008). All of these factors impact student persistence and success in college. Ultimately, student engagement is conceptualized as a product of both these institutional factors and student behaviors (Kuh et al., 2008). In keeping with this framework, higher education institutions have the ability to bolster student engagement and retention by adapting support practices and programming to fit their student body population.

Astin's Inputs-environment-outcome (I-E-O) college impact model underscores this same idea—that student outcomes are a product of inputs (e.g. background characteristics) and environment (e.g. college experiences) (Astin, 1999). As such, the current study applies both Astin and Kuh's models of student engagement to an investigation into the self-reported experiences of college students with autism.

Although college student experiences of those on the autism spectrum has not yet been extensively documented in the literature, recent reports illustrate markedly high rates of mental health challenges and loneliness among this population (e.g. Jackson et al., 2018). Mental health factors may impact behavior and subsequently engagement and satisfaction with one's college. The social communication challenges associated with autism spectrum disorder may also impact the experiences of students with ASD on their campuses. Few studies have examined the self-

reported experiences of college students with ASD in relation to social self-confidence and its potential impact on social and/or academic engagement.

The present study aimed to characterize a sample of students with ASD and matched neurotypical peers in terms of several domains key to student engagement and retention: social self-confidence, psychological stress, campus service use, college satisfaction, sense of belonging, and self-regulated learning behaviors (e.g. academic engagement). Applying terminology from Astin's model, these domains include "inputs" (e.g. psychological health, self-confidence) as well as "environmental factors" (e.g. college experiences and behaviors) that impact overall student engagement. This study compares students with ASD and matched peers in order to highlight group differences on the domains of interest. Findings point to areas that students with ASD may benefit from additional tailored supports at their institutions.

Methods

Participants

Participants include students from 2 and 4-year colleges across the United States who completed surveys created by the Cooperative Institutional Research Program (CIRP). CIRP is a research program managed by the Higher Education Research Institute (HERI) at the University of California, Los Angeles that annually provides a series of surveys to participating colleges and universities. The Freshman Year Survey (TFS) and Your First College Year Survey (YFCY) are two surveys included in the CIRP program. TFS is a self-report survey that assesses the background characteristics, beliefs, and expectations about college of incoming freshmen before students begin coursework. YFCY is a self-report survey administered at the end of freshman year, which assesses the academic and personal development of students during their first year of

college. The TFS and YFCY surveys were approved by the UCLA Institutional Review Board with a waiver of signed informed consent.

Beginning in 2012 and for subsequent even years, the TFS included a question that allows participants to disclose neurodevelopmental, physical health, and mental health diagnoses. Participants were asked, “Do you have any of the following disabilities or medical conditions?” response options included: “learning disability (dyslexia, etc.)”, “Attention deficit hyperactivity disorder (ADHD)”, “Autism spectrum disorder”, “Physical disability (speech, sight, mobility, hearing, etc.)”, “Chronic illness (cancer, diabetes, autoimmune disorders, etc.)”, “Psychological disorder (depression, etc.)”, or “Other”. Participants selected each option applicable to them.

Participants for the current study were sampled from those who completed the Your First College Year survey (YFCY) during years 2013, 2015, and 2017 who had also completed The Freshman Year Survey (TFS) one year prior. Therefore, data for the present study were collected across two time points, one year apart. The TFS survey is referred to as Time 1 (T1) of data collection followed by the YFCY survey at Time 2 (T2).

Case control matching was used to select a typically developing control sample that was matched to students with ASD on year of survey form completed, gender, income, race/ethnicity, level of depression (T1), and college selectivity (i.e. average SAT score; T1) using the case control fuzzy procedure in SPSS version 25. The final sample included N= 206 college freshmen, including N= 103 students with self-reported ASD.

Measures

For the present study, items were collected that are present across YFCY survey years 2013, 2015, and 2017 that assessed social self-confidence, psychological health, sense of belonging, college satisfaction, campus service use, and self-regulated learning.

Demographics. The following demographic characteristics of the sample were assessed in order to confirm success of the case control matching procedure: 1) annual family income (i.e. less than 30k, 30k-50k, 50-100k, and over 100k), 2) college selectivity (i.e. Scholastic Aptitude Test (SAT) scores for students attending the institution), 3) gender (male or female), and 4) race/ethnicity (White or Non-White).

Social Self-confidence. Social self-confidence was computed from 2 items ($\alpha = 0.66$), including: “Rate yourself compared to the average person your age: a) social self-confidence and b) leadership ability”. Each item was rated on a scale of 1 to 5: 1= lowest 10%, 2= below average, 3= average, 4= above average, and 5= highest 10%. Higher construct sum scores indicate higher levels of social self-confidence.

Psychological Stress. Psychological Stress was computed from 3 items ($\alpha = 0.68$). The following items were included in the construct: 1) frequency of feeling depressed during the past year, 2) frequency of feeling lonely or homesick during the past year, and 3) frequency of feeling isolated from campus life during the past year. Response options included: 1= not at all, 2= occasionally, or 3= frequently. Higher construct sum scores indicate higher levels of psychological stress.

Sense of Belonging. Sense of belonging was computed from 2 items ($\alpha = 0.83$): “Please indicate the extent to which you agree or disagree with the following statements: a) I see myself as part of the campus community, b) I feel I am a member of this college”. Each item was rated

on a scale of 1 to 4: 1= strongly disagree, 2= disagree, 3= agree, 4=strongly agree. Higher construct sum scores indicate higher levels of sense of belonging.

College Satisfaction. Satisfaction with college experience was computed from 3 items ($\alpha = 0.82$), including the following: “Please rate your satisfaction with your college in each area: a) overall sense of community among students, b) overall college experience, c) overall quality of instruction.” Response options included: 1= can’t rate/no experience, 2=very dissatisfied, 3= dissatisfied, 4=neutral, 5= satisfied, and 6= very satisfied. Higher construct sum scores indicate higher levels of satisfaction with college experience.

Campus Service Use. Service use was computed from 8 items ($\alpha = 0.74$), including: “Since entering college, how often have you utilized the following services: a) study skills advising, b) financial advising, c) student health services, d) student psychological services, e) writing center, f) disability resource center, g) career services, h) academic advising. Items were rated on a 3 point scale: 1= not at all, 2= occasionally, 3= frequently. Higher construct sum scores indicate more frequent service use.

Self-regulated Learning. Self-regulated learning was computed from 2 sets of items: academic engagement and academic disengagement. Academic engagement was computed from 5 items ($\alpha = 0.68$), including: “how often in the past year did you: a) ask questions in class, b) seek solutions to problems or explain them to others, c) seek alternative solutions to a problem, d) support your opinions with a logical argument, e) explore topics on your own, even though it was not required for class”. Items were rated on a scale from 1 to 3: 1= not at all, 2=occasionally, 3=frequently. Higher construct sum scores indicate higher academic engagement. Academic disengagement was computed from 5 items ($\alpha = 0.66$), including: “Since entering this college, how often have you: a) been late to class, b) turned in course assignments late, c) turned in

course assignments that did not reflect your best work, d) skipped class, e) fell asleep in class. Items were rated on a scale from 1 to 3: 1= not at all, 2=occasionally, 3=frequently. Higher construct sum scores indicate a greater level of academic disengagement.

Analyses

To confirm that the case-control matching procedure was successful, the ASD and TDC groups were compared on each demographic variable of interest. For variables with binary outcomes (i.e. gender and race/ethnicity), chi squared tests were used. Multinomial logistic regression was used to test for differences in family income, and an independent sample means t-test was used for continuous outcomes (i.e. college selectivity).

To create constructs of interest, items common to the YFCY survey years 2013, 2015, and 2017 that assessed self-regulated learning (academic engagement and disengagement), psychological stress, social self-confidence, campus service use, sense of belonging, and college satisfaction were culled.

A polychoric correlation matrix was created to estimate inter-item correlations within and across hypothesized constructs. A confirmatory factor analysis (CFA) was then attempted using MPlus. Results illustrated less than satisfactory model fit indices for all constructs of interest. As a result, the hypothesized constructs were then modified to include only items with the same response options (e.g. 1=not at all, 2=occasionally, 3=frequently) and sum scores for each construct of interest were computed. Sum scores were plotted to examine each distribution and to check for excessive skew. Cronbach's alpha was computed for each construct of interest separately. Constructs with an α level of 0.65 or above were retained for use in the group comparison analyses that follow.

To investigate group differences on each construct of interest, separate ANOVAs were conducted. Predictors in each set of analyses included year of survey form, diagnostic group, gender, and the interaction between gender and diagnostic group. Dependent variables were each construct of interest (e.g. social self-confidence). Distributions of sum scores for each construct were examined by gender and group (e.g. males with ASD, females without ASD) in order to determine whether to explore a gender by group interaction. Examination of the distributions revealed that across the majority of constructs, females with ASD appeared to have different patterns of responses compared to males with ASD, and TDC gender groups. To further investigate these descriptive patterns in the data, gender was included as a predictor and interaction term (gender x diagnostic group).

A Bonferroni correction was applied to account for the number of statistical tests used for group comparisons based on the number of constructs ($N=7$). Alpha was set to 0.007 ($0.05/7$) as the cutoff for statistical significance for use in interpreting results of the ANOVAs.

Results

Demographic Characteristics

Descriptive information on the sample by diagnostic group is reported in Table 1. Tests of group differences in demographic information were conducted for the purpose of ensuring success of the case control matching procedure. Results indicated that the ASD and TDC groups were not significantly different from one another on any of the demographic variables of interest (race/ethnicity, gender, family income, college selectivity; all p -values >0.05).

Social Self-confidence

There was a significant main effect of diagnostic group, $F(1,200)= 20.52, P <0.001$, such that neurotypical students rated their social self-confidence as significantly higher (Estimated

marginal mean=6.84, SE= 0.20) than their peers with autism (Estimated marginal mean= 5.55, SE= 0.20). There was no significant main effect of gender, $F(1,200)= 3.53, P= 0.06$, and no interaction between gender and diagnostic group on social self-confidence, $F(1,200)= 1.25, P= 0.27$ (Table 3).

Psychological Stress

There was a significant main effect of diagnostic group, $F(1,201)= 10.81, P < 0.007$, such that neurotypical students reported significantly lower psychological stress (Estimated marginal mean=5.35, SE=0.16) compared to students with ASD (Estimated marginal mean=6.17, SE=0.18; see table 4). There was no significant main effect of gender, $F(1,201)= 19.97, P= 0.007$, although the p-value for this test approached statistical significance (male estimated marginal mean= 5.42, SE=0.14; female estimated marginal mean= 6.10, SE= 0.21). There was no interaction between gender and diagnostic group on psychological stress, $F(1,201)= 5.62, P= 0.15$.

Sense of Belonging

There were no significant main effects of diagnostic group, $F(1,201)= 0.38, P= 0.54$, or gender, $F(1,201)= 0.71, P= 0.40$ on sense of belonging. There was no interaction between gender and diagnostic group on sense of belonging, $F(1,201)= 3.48, P= 0.06$ (see table 5 for detailed results).

College Satisfaction

The covariate, year of survey form completed, was significantly related to college satisfaction, $F(1,201)= 17.98, P < 0.001$. There were no significant main effects of diagnostic group, $F(1,201)= 1.04, P= 0.31$, or gender, $F(1,201)= 1.27, P= 0.26$. There was no significant

interaction between gender and diagnostic group on college satisfaction, $F(1,201)= 6.27, P= 0.01$ (see table 6).

Campus Service Use

The covariate, year of survey form completed, was significantly related to service use, $F(1,201)= 129.88, P= 0.003$. There were no significant main effects of diagnostic group, $F(1,201)= 0.92, P= 0.34$ or gender, $F(1,201)= 0.03, P= 0.85$, on campus service use. There was no significant interaction between diagnostic group and gender, $F(1,201)= 0.36, P= 0.55$ (see table 7).

Self-regulated Learning

Academic Engagement. There were no significant main effects of diagnostic group, $F(1,201)= 0.68, P= 0.41$, or gender, $F(1,201)= 1.16, P= 0.28$, on academic engagement. There was no significant interaction between gender and diagnostic group on academic engagement, $F(1,201)= 1.71, P= 0.19$ (see table 8).

Academic Disengagement. There were no significant main effects of diagnostic group, $F(1,201)= 0.18, P= 0.67$, or gender, $F(1,201)= 0.01, P= 0.92$, on academic engagement. There was no significant interaction between gender and diagnostic group on academic engagement, $F(1,201)= 1.64, P= 0.60$ (see table 9 for detailed results of ANOVA).

Table 2 depicts estimated marginal means (based on construct sum scores) by diagnostic group and gender, controlling for year of survey form.

Discussion

The number of students with autism enrolled in postsecondary programs across the United States is consistently growing (Roux et al., 2015). Given the importance of postsecondary retention to later adulthood outcomes (e.g. independent living, job attainment), it is critical that

we better understand how to support students with autism enrolled in higher education. Each section that follows discusses results of the present study and relevant implications for higher education programming and supports. A greater understanding of the self-reported attitudes, feelings, and behaviors of students with ASD informs institutions about how they may design campus-wide initiatives that will reach the most pressing needs of students on the spectrum.

Social Self-confidence

Extant literature shows that many youth with ASD have awareness of a difference in their social preferences and motivation in comparison to neurotypical peers (e.g. Van Hees et al., 2015). Results of this study are consistent with this literature, as students with ASD reported significantly lower levels of social self-confidence compared to a demographically-matched sample of typically developing students. These findings suggest a need to explicitly address social self-confidence and associated mental health sequelae in existing social skills training programs or other supports for youth with ASD.

The social self-confidence domain explored in this study includes survey questions that ask the student to rate themselves in terms of not only social self-confidence, but also leadership ability in comparison to “an average person your age.” As such, our results suggest that targeted supports around leadership skills may be particularly important for college students with ASD. These results represent self-ratings at the end of freshman year, suggesting that the first year of college may be an appropriate time for leadership trainings and social self-confidence-oriented programming to be implemented at higher education institutions. Small sample sizes in the female ASD and no-ASD groups ($n= 31$ and $n=32$, respectively) may have contributed to the lack of significance found for a gender main effect or gender by diagnostic group interaction.

Examining the social self-confidence construct sum scores across diagnostic groups and genders provides additional information (see table 2 for sum construct scores by group and gender). On average, females with ASD reported social self-confidence ratings that were the lowest of all groups, with a sum score of 5.12 (equivalent to an average social self-confidence construct score of 2.56). Given that items in the social self-confidence construct were rated on a 1-5 Likert scale, females with ASD were on average rating themselves as below average or average in terms of social self-confidence compared to their peers. Future work with larger sample sizes of females with ASD and without ASD will be better powered to explore group by gender differences in social self-confidence.

Psychological Stress

Results of this study show that students with ASD rate their psychological stress (frequency of feelings depressed, lonely or homesick, and isolated) as significantly higher than matched peers without ASD. Importantly, the ASD and no-ASD groups were matched on frequency of depressive symptoms at T1 (beginning of freshman year). Therefore, these findings show that controlling for frequency of depression at college entry, students with ASD report significantly higher incidences of depressive feelings than their TD peers just one year later. These findings underscore the need for psychological support services for college students with ASD that has been established in recent literature (Gelbar et al., 2014; Jackson et al., 2018; Sturm & Kasari, 2019). A main effect of gender on psychological stress was trending towards statistical significance ($P = .007$), suggesting that future work including larger samples of female students may be better powered to elucidate gender-specific differences in mental health.

Several mental health interventions for college-aged youth exist and are implemented in student psychological centers around the country. Despite these accessible supports, these

findings show that students with ASD are still differentially impacted by mental health challenges. Therefore, higher education institutions may find it useful to test the implementation and efficacy of university-wide mental health programs (e.g. Depression Grand Challenge, etc.) that are designed to be accessible to all enrolled students. Other approaches such as virtual cognitive behavioral therapy (CBT) programs have also shown promising results in the college student population (Anastopoulous et al., 2015). A variety of approaches to mental health intervention during the first year of college should be tested for efficacy across different populations of college students to determine their impact and fit. Student psychological services clinicians may also benefit from specific training on adaptations of evidence-based treatments like CBT for students with autism and other neurodevelopmental diagnoses.

Sense of Belonging

Students with ASD were not significantly different from matched neurotypical peers in terms of level of sense of belonging to their institutions. Descriptively, on average, students in the sample stated that they agreed with statements that assessed sense of belonging (e.g. “I see myself as a member of this campus community;” ASD group sum score= 5.77, noASD group sum score= 5.92, equivalent to a rating of “agree” on the 1-4 Likert scale). Descriptively, the ASD group rated their sense of belonging as lower than typically developing peers (see table 2), although this difference was not statistically significant.

Only 2 survey items make up the sense of belonging domain used in this study. Despite an acceptable reliability alpha level of 0.83, the limited number of items included in this domain limit our ability to adequately assess the overarching construct of sense of belonging in this sample. Future surveys may benefit from the inclusion of multiple questions that attempt to

assess this construct in a number of different ways. It is a concern that both items in our sense of belonging construct were similar in wording.

College Satisfaction

Results showed that students with ASD and matched neurotypical peers were similar in their ratings of satisfaction with their colleges. Although no significant group or gender by group differences were found, descriptive examination of group sum scores showed that students with ASD rated their satisfaction as lower than their neurotypical peers. Females with ASD reported the lowest ratings of satisfaction across all gender and diagnostic groups, although the difference was not significant (see table 2). Contrary to our hypothesis, students with ASD and matched neurotypical peers appear to have similar levels of college satisfaction. Future work should continue to explore feelings of satisfaction in similar samples. Additionally, future studies can examine how college satisfaction is related to other important factors like psychological health.

Campus Service Use

Students with ASD and matched TD peers were similar in terms of campus service use. Estimated marginal means showed that the ASD group reported using services slightly more frequently than TD peers, but this difference was not significant. A future direction for this construct is to dichotomize response options to “yes/no” rather than “not at all, occasionally, or frequently” in order to get a better sense of which groups are utilizing services versus not.

These findings suggest that students with ASD are not utilizing campus services (e.g. psychological services, writing center) at a higher rate than peers without ASD. Averages computed from construct sum scores in table 2 illustrate that students in both the ASD and no-ASD groups report that they don’t use campus services at all or only occasionally (all items rated

on a 1-3 Likert scale; 1=not at all, 3= frequently). These findings suggest that campuses should explore how they can make their services more accessible to students.

Self-regulated Learning

Students with ASD were similar to the no-ASD group on academic engagement and disengagement domains. Students with ASD and neurotypical peers typically responded to academic engagement items with the response “occasionally” (e.g. “how often in the past year did you: raise your hand in class; see table 2). Both groups had estimated marginal means in the 7.6-7.8 range, indicating that students on average chose the response “occasionally” in reference to the academic disengagement items as well (e.g. “how often in the past year have you skipped class”). These findings support results from previous work that illustrates that individuals with ASD are similarly intellectually-engaged with their institutions as peers without autism (Jackson et al., 2018; Sturm & Kasari, 2019).

Limitations

A major limitation of the current study is the small sample sizes of female students in both the ASD and neurotypical groups. Additionally, several items in the domains included in this study (e.g. sense of belonging) included only 2 survey items. As a result of the few number of items included in some of the domains, reliability of some of the subscales fell slightly below generally-accepted standards ($\alpha = 0.7$). Findings should be interpreted within the context of these limitations. Despite these limitations, the present study offers a unique picture into the self-reported attitudes, experiences, and behaviors of students with autism enrolled in higher education programs throughout the U.S.

Taken together, these results suggest that students with ASD would benefit from increased supports around mental health and social self-confidence in particular. Notably,

students with autism are similar to their neurotypical peers on a host of other domains important to college persistence and success (academic engagement/disengagement, sense of belonging, service use, and college satisfaction). Higher education institutions should explore more creative ways to engage students in available mental health supports, such as campus-wide psychological health interventions. The efficacy of campus-wide mental health programming should be evaluated across groups of students and clinicians on campus should receive training on how to adapt evidence-based approaches (e.g. CBT) for individuals with autism. Additionally, programs that target social self-confidence, social skills, and leadership skills may be particularly useful to implement during the first year of college to promote the wellbeing and success of students with self-identified autism.

Appendix

Table 1. Demographic Characteristics of Sample by Diagnostic Group

Variable	ASD	TDC	Total Sample
N	103	103	206
Gender: male, N(%)	72 (69.9%)	71 (68.9%)	143 (69%)
Race: Caucasian, N (%)	71 (68.9%)	71 (68.9%)	142 (68.9%)
Family income			
Under 30k, N (%)	27 (26.2%)	27 (26.2%)	54 (26.2%)
30k-50k, N (%)	43 (41.7%)	43 (41.7%)	86 (41.7%)
50k-100k, N (%)	11 (10.7%)	11 (10.7%)	22 (10.7%)
Over 100k, N (%)	22 (21.4%)	22 (21.4%)	44 (21.4%)
Selectivity M(SD)	1173.5 (113.7)	1179.8 (109.7)	1176.6 (111.5)

Note. “Selectivity” refers to the average SAT score of students enrolled in their respective institution

Table 2. Estimated marginal means (based on construct sum scores) by diagnostic group and gender, controlling for year of survey form

Group	ASD total	ASD males	ASD females	NoASD total	NoASD males	NoASD females
Social self-confidence	5.55	5.98	5.12	6.84	6.95	6.73
Psychological stress	6.17	5.65	6.69	5.35	5.19	5.51
Sense of belonging	5.77	6.10	5.44	5.92	5.80	6.05
College satisfaction	13.33	14.29	12.37	13.87	13.50	14.23
Campus Service Use	11.86	11.97	11.74	11.31	11.08	11.53
Academic engagement	12.12	12.13	12.19	11.92	12.27	11.56
Academic disengagement	7.79	7.86	7.71	7.63	7.51	7.74

Table 3. Results of ANOVA examining impact of diagnostic group and gender on social self-confidence

Predictor	df	SS	MS	F	<i>p</i>
Model	4	104.88	26.22	7.43	<.001
Diagnostic group	1	72.43	72.43	20.52	<.001
Gender	1	12.46	12.46	3.53	0.06
Diagnostic group * Gender	1	4.39	4.39	1.25	0.27
Year	1	14.62	14.62	4.14	0.04
Residual	200	705.97	3.53		
Total	204	810.85			

Table 4. Results of ANOVA examining impact of diagnostic group and gender on psychological stress

Predictor	df	SS	MS	F	<i>p</i>
Model	4	53.25	13.31	4.95	0.001

Diagnostic group	1	29.02	29.02	10.81	0.001
Gender	1	19.97	19.97	7.42	0.007
Diagnostic group *	1	5.62	5.62	2.09	0.15
Gender					
Year	1	2.62	2.62	0.97	0.33
Residual	201	540.97	2.69		
Total	205	594.22			

Table 5. Results of ANOVA examining impact of diagnostic group and gender on sense of belonging *

Predictor	df	SS	MS	F	<i>p</i>
Model	4	13.39	3.35	1.27	0.28
Diagnostic group	1	0.99	0.99	0.38	0.54
Gender	1	1.86	1.86	0.71	0.40
Diagnostic group *	1	9.16	9.16	3.48	0.64
Gender					
Year	1	1.83	1.83	0.69	0.41
Residual	201	529.04	2.63		
Total	205	542.43			

Table 6. Results of ANOVA examining impact of diagnostic group and gender on college satisfaction

Predictor	df	SS	MS	F	<i>p</i>
Model	4	330.63	82.66	6.78	<.001
Diagnostic group	1	12.70	12.70	1.04	0.31
Gender	1	15.48	15.48	1.27	0.26
Diagnostic group *	1	76.50	76.50	6.27	0.01
Gender					
Year	1	129.88	129.88	9.14	0.003
Residual	201	2451.04	12.19		
Total	205	2781.67			

Table 7. Results of ANOVA examining impact of diagnostic group and gender on campus service use

Predictor	df	SS	MS	F	<i>p</i>
Model	4	159.83	39.96	2.81	0.03
Diagnostic group	1	13.11	13.11	0.92	0.34
Gender	1	0.49	0.49	0.03	0.85
Diagnostic group *	1	5.14	5.14	0.36	0.55
Gender					
Year	1	129.88	129.88	9.14	0.003
Residual	201	2856.85	14.21		
Total	205	3016.68			

Table 8. Results of ANOVA examining impact of diagnostic group and gender on academic engagement

Predictor	df	SS	MS	F	<i>p</i>
Model	4	11.57	2.89	0.76	0.55
Diagnostic group	1	2.61	2.61	0.68	0.41
Gender	1	4.42	4.42	1.16	0.28
Diagnostic group * Gender	1	6.54	6.54	1.71	0.19
Year	1	0.01	0.01	0.00	0.95
Residual	201	766.49	3.81		
Total	205	778.06			

Table 9. Results of ANOVA examining impact of diagnostic group and gender on academic disengagement

Predictor	df	SS	MS	F	<i>p</i>
Model	4	9.17	2.29	0.38	0.82
Diagnostic group	1	1.09	1.09	0.18	0.67
Gender	1	0.07	0.07	0.01	0.92
Diagnostic group * Gender	1	1.64	1.64	0.27	0.60
Year	1	4.67	4.67	0.78	0.38
Residual	201	1208.17	6.01		
Total	205	1217.34			

References

- Anastopoulos, A. D., & King, K. A. (2015). A cognitive-behavior therapy and mentoring program for college students with ADHD. *Cognitive and Behavioral Practice, 22*(2), 141-151.
- Armstrong, S., & Oomen-Early, J. (2009). Social Connectedness, Self-Esteem, and Depression Symptomatology Among Collegiate Athletes Versus Nonathletes. *Journal of American College Health, 57*(5), 521–526. <https://doi.org/10.3200/JACH.57.5.521-526>
- Bauminger, N., & Kasari, C. (2000). Loneliness and Friendship in High-Functioning Children with Autism. *Child Development, 71*(2), 447–456.

- Braxton, J. M., & McClendon, S. A. (2001). The Fostering of Social Integration and Retention through Institutional Practice. *Journal of College Student Retention: Research, Theory & Practice*, 3(1), 57–71. <https://doi.org/10.2190/RGXJ-U08C-06VB-JK7D>
- Cai, R. Y., & Richdale, A. L. (2016). Educational Experiences and Needs of Higher Education Students with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 46(1), 31–41. <https://doi.org/10.1007/s10803-015-2535-1>
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Sage Publications, Inc.
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534.
- Elder, G. H., Johnson, M. K., & Crosnoe, R. (2003). The Emergence and Development of Life Course Theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 3–19). Boston, MA: Springer US. https://doi.org/10.1007/978-0-306-48247-2_1
- Elias, R., & White, S. W. (2018). Autism Goes to College: Understanding the Needs of a Student Population on the Rise. *Journal of Autism and Developmental Disorders*, 48(3), 732–746. <https://doi.org/10.1007/s10803-017-3075-7>
- Farley, M. A., McMahon, W. M., Fombonne, E., Jenson, W. R., Miller, J., Gardner, M., ... Coon, H. (2009). Twenty-year outcome for individuals with autism and average or near-average cognitive abilities. *Autism Research*, 2(2), 109–118. <https://doi.org/10.1002/aur.69>

- Gelbar, N. W., Shefcyk, A., & Reichow, B. (2015). A Comprehensive Survey of Current and Former College Students with Autism Spectrum Disorders. *The Yale Journal of Biology and Medicine*, *88*(1), 45–68.
- Gelbar, N. W., Smith, I., & Reichow, B. (2014). Systematic Review of Articles Describing Experience and Supports of Individuals with Autism Enrolled in College and University Programs. *Journal of Autism and Developmental Disorders*, *44*(10), 2593–2601. <https://doi.org/10.1007/s10803-014-2135-5>
- Higher Education Research Institute (Los Angeles). (2018). About HERI. Retrieved from <https://heri.ucla.edu/about-heri/>
- Jackson, S. L. J., Hart, L., Brown, J. T., & Volkmar, F. R. (2018). Brief Report: Self-Reported Academic, Social, and Mental Health Experiences of Post-Secondary Students with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *48*(3), 643–650. <https://doi.org/10.1007/s10803-017-3315-x>
- Jackson, S. L. J., Hart, L., & Volkmar, F. R. (2018). Preface: Special Issue—College Experiences for Students with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *48*(3), 639–642. <https://doi.org/10.1007/s10803-018-3463-7>
- Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the Effects of Student Engagement on First-Year College Grades and Persistence. *The Journal of Higher Education*, *79*(5), 540–563.
- Lee, C., Dickson, D. A., Conley, C. S., & Holmbeck, G. N. (2014). A Closer Look at Self-Esteem, Perceived Social Support, and Coping Strategy: A Prospective Study of Depressive Symptomatology Across the Transition to College. *Journal of Social and Clinical Psychology*, *33*(6), 560–585. <https://doi.org/10.1521/jscp.2014.33.6.560>

- National Center for Education Statistics. (2017). Digest of Education Statistics, 2017. Retrieved November 5, 2018, from https://nces.ed.gov/programs/digest/d17/tables/dt17_302.30.asp
- National Institute of Mental Health. (2016, October). Autism Spectrum Disorder. Retrieved December 11, 2017, from <https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml>
- Newman, L., Wagner, M., Knokey, A.-M., Marder, C., Nagle, K., Shaver, D., ... Swarting, M. (2011). *The Post-High School Outcomes of Young Adults with Disabilities up to 8 Years After High School. A Report from the National Longitudinal Transition Study-2 (NLTS2) (NCSE 2011-3005)*. Menlo Park, CA: SRI International. Retrieved from https://nlts2.sri.com/reports/2011_09_02/index.html
- Newman, Lynn, Wagner, M., Knokey, A.-M., Marder, C., Nagle, K., Shaver, D., ... Swarting, M. (n.d.). *The Post-High School Outcomes of Young Adults With Disabilities up to 8 Years After High School*, 218.
- Orsmond, G. I., Shattuck, P. T., Cooper, B. P., Sterzing, P. R., & Anderson, K. A. (2013). Social Participation Among Young Adults with an Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 43(11), 2710–2719. <https://doi.org/10.1007/s10803-013-1833-8>
- Powers, K. M., Gil-Kashiwabara, E., Geenen, S. J., Powers, L. E., Balandran, J., & Palmer, C. (2005). Mandates and effective transition planning practices reflected in IEPs. *Career Development for Exceptional Individuals*, 28(1), 47–59.
- Roux, A. M., Shattuck, P. T., Rast, J. E., Rava, J. A., & Anderson, K. A. (2015). *National Autism Indicators Report: Transition into Young Adulthood. Life Course Outcomes Research Program*, A.J. Drexel Autism Institute, Drexel University.

- Sanford, C., Newman, L., Wagner, M., Cameto, R., Knokey, A.-M., & Shaver, D. (n.d.). The Post-High School Outcomes of Young Adults With Disabilities up to 6 Years After High School. Key Findings From the National Longitudinal Transition Study-2 (NLTS2), 106.
- Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary Education and Employment Among Youth With an Autism Spectrum Disorder. *PEDIATRICS*, *129*(6), 1042–1049.
<https://doi.org/10.1542/peds.2011-2864>
- Shattuck, Paul T, Roux, A. M., Hudson, L. E., Taylor, J. L., Maenner, M. J., & Trani, J.-F. (2012). Services for Adults With an Autism Spectrum Disorder. *Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie*, *57*(5), 284–291.
- Shattuck, Paul T., Steinberg, J., Yu, J., Wei, X., Cooper, B. P., Newman, L., & Roux, A. M. (2014). Disability Identification and Self-Efficacy among College Students on the Autism Spectrum. *Autism Research and Treatment*, *2014*, 1–7.
<https://doi.org/10.1155/2014/924182>
- Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric Disorders in Children With Autism Spectrum Disorders: Prevalence, Comorbidity, and Associated Factors in a Population-Derived Sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(8), 921–929.
<https://doi.org/10.1097/CHI.0b013e318179964f>
- Sturm, A., & Kasari, C. (2019). Academic and psychosocial characteristics of incoming college freshmen with autism spectrum disorder: The role of comorbidity and gender. *Autism Research*, *12*(6), 931-940.

- U.S. Department of Health and Human Services. (2017, October). Report to Congress: Young Adults and Transitioning Youth with Autism Spectrum Disorder. Retrieved December 10, 2017, from <https://www.hhs.gov/sites/default/files/2017AutismReport.pdf>
- Van Hees, V., Moyson, T., & Roeyers, H. (2015). Higher education experiences of students with autism spectrum disorder: Challenges, benefits and support needs. *Journal of autism and developmental disorders*, 45(6), 1673-1688.
- Vickerstaff, S., Heriot, S., Wong, M., Lopes, A., & Dossetor, D. (2007). Intellectual Ability, Self-perceived Social Competence, and Depressive Symptomatology in Children with High-functioning Autistic Spectrum Disorders. *Journal of Autism and Developmental Disorders*, 37(9), 1647–1664. <https://doi.org/10.1007/s10803-006-0292-x>
- White, S. W., Elias, R., Salinas, C. E., Capriola, N., Conner, C. M., Asselin, S. B., ... Getzel, E. E. (2016). Students with autism spectrum disorder in college: Results from a preliminary mixed methods needs analysis. *Research in Developmental Disabilities*, 56, 29–40. <https://doi.org/10.1016/j.ridd.2016.05.010>
- Williams, K. L., & Galliher, R. V. (2006). Predicting Depression and Self-Esteem from Social Connectedness, Support, and Competence. *Journal of Social and Clinical Psychology*, 25(8), 855–874. <https://doi.org/10.1521/jscp.2006.25.8.855>
- Wing, L. (1992). Manifestations of Social Problems in High-Functioning Autistic People. In *High-Functioning Individuals with Autism* (pp. 129–142). Springer, Boston, MA. https://doi.org/10.1007/978-1-4899-2456-8_7.