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From the Editor

The lead article in this issue of the *Journal of Postsecondary Education and Disability* examined predictors associated with college attendance and persistence among students with visual impairments. The authors, **Lydia Schuck, Robert Wall-Emerson, Dae Shik Kim,** and **Nickola Nelson** (Western Michigan University), analyzing data from the second National Longitudinal Transition Study, found that parent expectation of a youth's attendance was the variable most strongly associated with college attendance. The student's ability to find academic assistance from sources outside of university-provided supports was the variable most strongly associated with persistence to at least 30 credits. In the next article, **I-Chen Wu** (The University of British Columbia) and **Rudy Molina Jr.** (University of Illinois at Chicago) addressed self-determination of college students with learning and attention challenges and explored students' perceptions of self-determination to improve the quality of departmental programing by improving preventions and interventions. Overall, most students reported they sometimes performed self-determined behaviors: female students' perceptions of self-determination were significantly higher than male students, and no significant differences across ethnicity categories were found.

In the third article, risks and correlates of alcohol and substance use for first-year college students with attention deficit/hyperactivity disorder (ADHD) were researched. **Chelsea Busch, George DuPaul** (Lehigh University), **Arthur Anastopoulos** (University of North Carolina at Greensboro), **Melanie Franklin, Aliza Jaffe, Kristen Stack** (Lehigh University), and **Lisa Weyandt** (University of Rhode Island) found that college students with ADHD were significantly more likely to use tobacco, cannabis, and illicit drugs, but not alcohol. Separate analyses indicated that use outcomes of each of the four substances were best explained by a unique combination of predictive factors. Anxiety symptoms and executive functioning deficits correlated with increased use of at least two of the substances. In the next article, **Ann Murphy, Derek Malenczak,** and **Mina Ghajar** (Rutgers, The State University of New Jersey) identified challenges and benefits of online education for students with a psychiatric disability (PD). They found that students with a PD endorsed the challenges of time management, had difficulty concentrating, and experienced difficulty navigating the course website at a higher rate than students without a PD.

In the fifth article, navigating the university environment for students with psychiatric disabilities (PD) was addressed. **Suanne Kain** (University of California, Los Angeles), **Christina Chin-Newman** (California State University, East Bay), and **Sara Smith** (University of South Florida) explored the experiences of college students with one or more PD. Four major themes were identified through inductive thematic analysis: the effects of stigma on the university experience, the impact and effect of the symptoms of PD for students in the university environment, strategies for coping with the disability in the university environment, and the role of social support from university faculty and staff. Recommendations for improved outcomes were reported. In the next article, **Clare Papay** and **Meg Grigal** (University of Massachusetts Boston) reviewed the literature on postsecondary education (PSE) related to students with intellectual disabilities. The authors reported recent research and determined the impact of Transition and Postsecondary Programs for Students with Intellectual Disabilities funding on peer-reviewed literature. They also compared the domains and methodologies used with research on PSE for students with disabilities in general using the Postsecondary Access and Student Success (PASS) taxonomy (Dukes, Madaus, Faggella-Luby, Lombardi, & Gelbar, 2017).

This issue contains two practice briefs. The first practice brief describes how to build a fluent assistive technology testing pool to improve campus digital accessibility. **Kyle Shachmut** and **Amy Deschenes** (Harvard University) reviewed the benefits and challenges in creating the participant pool and implementation details. Further discussion included efficiencies for the university, learning by content creators, and potential directions for future research. In the next practice brief, **Stephanie Cawthon** and **Savannah Davidson** (The University of Texas at Austin) and **Sara Schley** (Rochester Institute of Technology) described inclusive teaching through student observations. The authors demonstrated how inclusive teaching may be a catalyst for collaboration between offices of disability services and faculty development as they work together to create a more accessible campus for students with disabilities. The issue concludes with a book review by **Amy Lomellini** (Molloy College) on *Reach Everyone, Teach Everyone: Universal Design for Learning in Higher Education* (by Thomas Tobin and Kristen Behling).

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The editorial team and review boards associated with the *Journal of Postsecondary Education and Disability* are pleased to provide these contributions to the literature on college students with disabilities by delivering this issue.

Roger D. Wessel, Ph.D.
Executive Editor

Reference

Dukes, L. L., Madaus, J. W., Faggella-Luby, M., Lombardi, A., & Gelbar, N. (2017). PASSing college: A taxonomy for students with disabilities in postsecondary education. *Journal of Postsecondary Education and Disability, 30*, 111-122.

Predictors Associated with College Attendance and Persistence Among Students with Visual Impairments

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Abstract

Students who are blind or visually impaired are attending college at higher rates than ever before but are not achieving comparable academic outcomes to peers without disabilities. The variables that are associated with success in the college context among students who are blind or visually impaired have not been quantitatively examined. In this study, the researchers analyzed data from the second National Longitudinal Transition Study (NLTS2; SRI International, 2000). The NLTS2 provided a nationally representative sample of youth who were blind or visually impaired. The authors sought to determine statistical predictors of college attendance and persistence. College persistence was defined as earning 30 credits, equivalent to the attainment of sophomore status. An earlier exploratory factor analysis had identified factors, which the authors used in in this study to perform the regression analyses of attendance and persistence. Parent expectation of a youth's attendance was the variable most strongly associated with college attendance. Youth whose parents expected them to attend college were nearly eight times as likely to attend, compared with youth whose parents did not expect them to attend college. The student's ability to find academic help from sources outside of university-provided supports was the variable most strongly associated with persisting to at least 30 credits. Students who reported finding help outside of university-provided supports were four times as likely to persist to 30 credits. Recommendations are made to school personnel, university personnel preparation programs, and university disability services professionals.

Keywords: blind, visually impaired, NLTS2, college, transition

Each fall, eager students who are blind or visually impaired (blind/VI) arrive on college campuses along with other freshmen to begin their journey toward graduation. Many of these students, their parents, and professionals in their support networks may approach the college experience with a sense of optimism. However, of those who began college in 2009, as many as 70% of students at two-year institutions and 46% at four-year institutions did not graduate from the same institution within 150% of the normal time (U.S. Department of Education [USDOE], 2017). This rate has remained stable within 2% for ten years.

Prior research has shown students who are blind/VI begin postsecondary programs at a rate of approximately 71% (Newman et al., 2011), which actually is slightly higher than the general population (68.1%; BLS, 2011), or of students with all disabilities considered as a group (67%; Newman et al., 2011). Students' chances of success are dependent on circumstances

that the students, parents, or staff in disability services offices may not be able to control or change. What are the factors that are associated with persisting or not? To what extent are they inherent or external to the students and associated with their prior experiences? And, in either case, what are the implications for supporting success? The current study sought to answer some of these questions about students who are blind/VI by exploring characteristics and experiences starting in high school that were associated with greater likelihood of attending college and of persisting to earn 30 credits. This investigation was made possible by access to a longitudinal data set.

Literature Review

Higher education is important for many reasons, but a primary reason is that it makes a difference in employment rates and salaries. Youth with disabili-

ties tend to have lower levels of both education and income than the general population (Newman et al., 2011), and they are less likely to be employed (O'Neill, Kaczetow, Pfaller & Verkuilen, 2017; Yelin & Trupin, 2003). Jobs with better salaries usually require higher levels of education than jobs with lower salaries, whether or not job seekers have disabilities (Carnevale & Fry, 2000), and people with disabilities who do not attend postsecondary school are more likely to be unemployed (Madaus, Grigal, & Hughes, 2014; Newman et al., 2011; Yelin & Trupin, 2003). Parents, general and special education teachers, and disability services professionals could make a difference in the lives of youth with disabilities by supporting academic success throughout the school years that could result in good salaries and high standard of living.

Individual demographics comprise the backdrop of each student's story, revealing risk and resilience factors that highlight the extra support needs of specific groups, as well as factors that may be associated with greater success. Demographic variables should be included in studies of persistence, but other factors could play a role. These might include skills learned at school and exposure to other experiences or availability of certain supports. These characteristics and experiences can change throughout the school and college years due to maturity, intervention, and access or availability of supports. Results of prior research, reviewed in the sections that follow, provide preliminary evidence for some skills and experiences associated with college success for students with disabilities as a larger group. These include, among others, academic achievement in high school, a sense of self-determination, and social skills. The present study investigated these features but also investigated characteristics specific to blindness and visual impairment that could be associated with college success, such as use of braille or large print, use of computer access technology and level of skills to move around campus effectively.

Demographic Descriptors

A youth's demographics, such as race, gender, family history, and socioeconomic status may play an important role in understanding outcomes. For complex social-historical reasons, members of racial minority groups with and without disabilities have lower college completion rates (Yamamoto & Black, 2013) and are three times less likely to be engaged in either employment or education after high school than non-minority youth (Benz, Yovanoff, & Doren, 1997). Although the vocational rehabilitation system is intended to operate on a level playing field, African Americans are less likely to receive financial support for college through the vocational rehabilitation system (Boutin & Wilson, 2012). Gender is also a factor in postsecondary outcomes.

Females with disabilities have fewer positive adult outcomes than males, although this may be more due to parent expectations of young women's ability to achieve (Hogansen, Powers, Geenen, Gil-Kashiwabara, & Powers, 2008). When Boutin and Wilson (2012) examined individual vocational rehabilitation plans, they noted that females with disabilities are more likely to pursue university training as a part of a vocational rehabilitation plan than males, who may pursue other options. They speculated, however, that this may reflect the growing number of females in the general population pursuing higher education.

In addition to race and gender demographics, family history may play a role in academic success. Being a member of the first generation in a family to attend college is recognized as a risk factor for dropping out, whether a student has disabilities or not (Chen, 2005). Having a disability increases the risk: first generation students with disabilities have lower grade point averages (Lombardi, Murray, & Gerdes, 2012) and higher drop-out rates (Lombardi et al., 2012; Pascarella, Pearson, Wolniak, & Terenzini, 2004), especially when faced with financial stress (Lombardi et al., 2012).

Regardless of disability status, greater financial stress may be a reflection of lower socioeconomic status, which has been noted as a barrier to postsecondary education (Karpur, Nazarov, Brewer, & Bruyere, 2014; Lee, Rojewski, Gregg, & Jeong, 2014; Madaus et al., 2014). If the student's high school is urban or is lower in socioeconomic composition (Niu & Tienda, 2012), lower academic outcomes are more common, attributed to having fewer resources that would support postsecondary persistence.

Preparation for Academics

Some evidence suggests that youth who are blind/VI may be less academically prepared than their peers without disabilities. Using the college preparedness index that they had devised, Horn and Berktold (1999) found that only 13.9% of students who are blind/VI were defined as adequately qualified for a four-year college experience. In the same study, the remaining 86.1% of students who are blind/VI were reported to be only minimally qualified or to be minimally to somewhat qualified. Moreover, twice as many students who are blind/VI take remedial math and English in high school, compared to students without disabilities (Newman et al., 2011). This allows them to complete high school, but may not

prepare them for the demands of college level work, raising the question of how students who are blind/VI decide whether to go to college. College students may also vary in their use of disability services offices.

Using Disability Services in College

Disability services personnel are present at every college that receives federal funding, which is virtually every campus in the nation. These professionals do not seek out students who need help, rather, they are present and must wait for students to self-disclose their disabilities and support needs. Although 87% of students with disabilities in a nationally representative study sample had received disability accommodations while in high school (Newman et al., 2011), only 19% of those who went on to college received some type of disability-related accommodation or support there. Notably, college students who are blind/VI received academic supports provided by the college at a rate of 59%, but their higher self-disclosure rate has not been investigated thoroughly, and this figure still indicates that 41% of those who received accommodations in high school do not disclose their disability. Perhaps, students who are blind/VI disclose at higher rates because they need more supports, or they may find it easier to request accommodations because their disability is obvious. Seeking help outside of formal supports provided by the college is common among students with and without disabilities (McCall, 2014; Newman et al., 2011). Whether or not they also used supports provided by the college, one study indicated that 52% of students who are blind/VI found academic help on their own (Newman et al., 2011).

Disability Disclosure

Disclosing their disabilities when in college is an indicator of a student's level of self-advocacy skills, one aspect of the self-determination construct. In a qualitative focus group study, students reported that, although they considered self-determination and self-advocacy important to success in college, they tried at first not to disclose their disabilities (Getzel & Thoma, 2008). After failing classes, those who disclosed their disabilities (to professors or disability support personnel) and requested accommodations reported being more successful. This is not surprising, given that higher levels of self-determination are associated with success in secondary education (Copeland, Hughes, Agran, Wehmeyer, & Fowler, 2002). Other evidence suggests, however, that college instructors may not always understand the needs of individual students when they do try to communicate their needs and preferences to instructors (Myers & Bastian, 2010).

Self Determination

Self-disclosure of disabilities may be associated with self-determination skills, so it is worth considering whether self-determination skills can be learned. Some evidence suggests that self-determination is not static; it can be increased among youth with disabilities through instruction in autonomy, self-advocacy, and psychological empowerment (Cobb & Alwell, 2009; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Fowler, 2013). Having higher levels of self-determination is useful only if a youth has opportunities to use those skills, however; some reports indicate that blind/VI youth not only have lower levels of self-determination but also fewer opportunities to practice self-determination skills than youth who are not blind/VI (Robinson & Lieberman, 2004; Sacks, Wolffe, & Tierney, 1998).

Self-determination also may interact with individual demographic characteristics, such as race and gender. Among all students with and without disabilities, Latino students reported higher self-determination skills than Anglo students (Rodriguez & Cavendish, 2012). Among males, but not females, ethnicity explained a significant amount of the variance in self-determination after controlling for family environment in this study.

High school may be one place for blind youth to practice self-determination, but only if they are included in general education classrooms and other mainstream activities. Inclusion in general education, that is, learning in a classroom alongside students without disabilities, has been associated with better educational outcomes in a number of studies, though not specifically for students who are blind/VI (Goodman, Hazelkorn, Bucholz, Duffy, & Kitta, 2011; Halpern, Yovanoff, Doren, & Benz, 1995; McCall, 2014). In the college setting, all students work together in the same settings, regardless of disability, and it is not known whether students who are blind/VI who experienced inclusive settings in high school will have more success in college. Self-empowerment and independence might be indicators of success in navigating the campus, especially for those who have better orientation and mobility skills.

Orientation and Mobility Skills

The ability to get around on campus, finding buildings, classrooms, and people would be valuable to any student, but results of outcomes research have been mixed in this area for students who are blind/VI. Orientation and mobility (O&M) skills refer to travel using alternative techniques to accommodate vision loss. These skills have a relationship to college success. Wolffe and Kelly (2011) found a positive

association between the receipt of O&M instruction and attending postsecondary education up to four years after high school, but the same association was not found when youth were two years older. O&M interventions may interact with other characteristics, as well. For example, although Cameto and Nagle (2007) found no differences in O&M skills related to age, gender, or race/ethnicity, they did note better scores on a measure of indoor campus O&M skills among students who were had higher incomes, who did not have additional disabilities, and who were visually impaired rather than totally blind. Even when students are deemed to be in need of O&M instruction, however, experts do not always agree on the specific skills needed by students with low vision in comparison with students who are totally blind (Wall Emerson & Corn, 2006). Although Wolffe and Kelly (2011) explored O&M skills in relation to postsecondary education, receiving orientation and mobility skills has not been connected with college persistence or any other measures of success in the extant literature. Use of technology is another skill area in which students who are blind/VI receive varying levels of instruction in high school.

Technology Use

Vision-based descriptors might change over time, particularly among youth with progressive eye diseases. Such descriptors could indicate whether the student is totally blind or losing vision during high school and college. Whether the characteristic is immutable or changing slowly over time, a student identified as at-risk may be helped by various interventions during the college years. Reading acuity and preferred reading medium may change over time, especially as a result of degenerative eye conditions. Many youths do not use exclusively one reading medium and may use varied assistive technology to access printed text as a result of problems with accessibility and the demands of college work (D'Andrea, 2012). Thus their degree of technology use in elementary and upper grades may be an important consideration.

Youth with visual impairment frequently use technology to access curriculum, but may not be receiving as much opportunity to learn how to use it. Fewer than half of elementary school youth with visual impairments use assistive technology (Kelly, 2009). Although more technology use would be expected as students who are blind/VI mature, Kelly (2011) found less than half of older youth were using technology. In both of Kelly's studies, parental involvement was positively associated with use of technology.

Internet use is important as well. Youth who are blind/VI are not engaged in using the internet to the same extent as their peers (Kelly & Wolffe, 2012), but postsecondary education is five times more likely among those who do use the internet for social communication. Other social skills do not involve technology, but are also important to college students who are blind/VI.

Social Skills

Social activities may be among the most prominent aspects of college life for all students. This is no different for youth who are blind/VI, but visual impairment can be a barrier to development of social skills (Zebehazy & Smith, 2011). Higher levels of social skills during the school years are associated with positive post-school outcomes among blind/VI youth (Botsford, 2013). In qualitative studies, college students in general note the importance of social skills and relationships. In prior research, successful students with a variety of disabilities reported having a personally significant relationship with one adult, either a faculty member or counselor in the office of student services (Barber, 2012; Getzel & Thoma, 2008). Relationships with peers, parents, and other family members were noted as important to successful students, as well as taking advantage of support groups and academic supports on campus (Getzel & Thoma, 2008). Blind/VI youth have been determined to have social skills levels equal to or higher than youth with other disabilities, but unfortunately they have only moderate levels of social skills compared to the general population, according to Gresham and Elliott's (1990) Social Skills Rating System (Zebehazy & Smith, 2011).

Independent Living Skills

In addition to social skills, college students must be able to take care of their personal needs in hygiene, cooking, and other areas. Students who have mastered these skills of independent living may have an advantage over students who need more support in self-care, as indicated by research that shows that they are more likely to attend postsecondary education (Blackorby, Hancock, & Siegel, 1993; Heal & Rusch, 1995). What is not known is whether independent living skills are associated with success in postsecondary education among students who are blind/VI. Parents not only teach many of the independent living skills to their own children, but each parent has an expectation of the child's adult outcomes, as well.

Parent Expectations

Doren, Gau, and Lindstrom (2012) explored data from a nationally representative sample of youth with learning disabilities or cognitive disabilities, finding that parent expectations have a large effect on adult success of individuals with disabilities. However, the same study revealed that the level of parent expectations may depend on the type of disability. The interplay of parent expectations with student outcomes is complex. It is not clear whether expectations drive outcomes or to what extend the type of disability drives the level of parent expectations.

Longitudinal Analysis to Study Outcomes of Students

Experimental or quasi-experimental techniques are often used to measure the effectiveness of interventions to teach skills that may increase achievement, whether a student is considered at risk or not (Hulley et al., 2001). However, even the best cross-sectional intervention study cannot connect skills or experience with longer term outcomes. To reliably compare outcomes, a study must use measure individual characteristics and experiences at the beginning (and often at several intermediate collection points), and then collect outcomes data at a later date (Trochim, 2001). This kind of analysis requires a large number of participants which makes such research an expensive and logistically difficult endeavor (Hulley et al.).

Although longitudinal cohort studies using large numbers of participants are expensive and difficult to conduct, their importance is recognized. Federal education legislation, including the updated IDEA in 2004, mandated research into effective educational interventions and predictors of positive outcomes. Government funding has allowed researchers to collect the large amounts of data needed to conduct a study of outcomes. The NLTS2 is an example of a longitudinal study that focused on youth characteristics and high school experiences and collected data every two years over a ten-year span (SRI International, 2000). By the end of the study, data had been collected that revealed the young adult outcomes of study participants.

Based on the literature reviewed, the investigators in the present study sought to explore the effects of various interventions, risk factors, skills, and prior and current experiences in association with academic outcomes in college. The following research questions guided this study.

1. Based on information available during high school, what demographic and disability descriptors, variables from the home and school contexts, youth skill areas, and work-related experiences are associated with the attendance of blind/VI students at two- and four-year colleges?
2. What variables measured during high school and in college and rehabilitation services contexts are associated with the outcome of college persistence among blind/VI students, when persistence is defined as completing freshman year (achieving 30 college credits)?

Methods

Data and Sample

The NLTS2 data set includes five waves of data collected over ten years' time with the same participants by asking informants (parents or youth) to respond to a set of questions about the youth's characteristics and experiences. Youth were surveyed in Waves 2 through 5. In the first wave only, teachers reported on disability characteristics such as use of accommodations and features of each youth's classroom experiences. A transcript summary was created after Wave 5 with complete transcripts. Approximately 10,000 students were subjects of the study.

Some 820 youths were eligible for special education services as a result of visual impairment. Individuals who are blind/VI were oversampled in the NLTS2, that is, the number of such participants represented a larger percentage of the study sample than are in the actual population. If these participants had not been oversampled, the sample size of blind/VI participants would have been too small for analysis. The oversampling is accounted for by application of sampling weights to represent proportions in the actual population.

Although the youngest students were only 13 during Wave 1, they were 21 by Wave 5. These participants had time to begin attending college and to persist to at least 30 credits, the equivalent of completing the freshman year of college. Persistence to 30 credits is a common early landmark for measurement of college success. Investigators chose this measure of success because the NLTS2 data did not include a sufficient number of participants with college completion data to perform desired analyses. Potential independent predictor variables were identified from all five waves of NLTS2 data collection.

Participants

The researchers used three inclusion criteria to identify participants: (1) having an educational diagnosis of visual impairment; (2) participation in a direct assessment of self-determination, self-concept, and academic achievement, administered in Wave 2;

and (3) having attendance and persistence outcomes recorded in the data set. The second criterion was used to limit study participants to blind/VI youth whose functional abilities allow them to reliably express answers to questions and to read independently (Wagner, Newman, Cameto, & Levine, 2006), skills that would be essential for attending college. Of the 420 blind/VI NLTS2 participants for whom direct assessment results were recorded in the data set, college attendance data were recorded for only approximately 280 participants. Among those who attended, persistence data was recorded for approximately 200 participants.

Outcome (Dependent) Variables

Two outcome variables were defined—attendance and persistence. The *Attendance* outcome was represented by a collapsed variable made of two dichotomous items in Wave 5, by selecting participants with positive answers to either of the following questions: "youth *ever* attended any two-year college in any wave" and "youth ever attended four-year college in any wave." The *Persistence* outcome variable represented achieving at least 30 college credits. This variable was created by collapsing variables in Wave 5, recording answers to questions whether the student had graduated, and if not, whether the student had earned 30 or more credits by Wave 5.

Potential Predictor (Independent) Variables

Demographic and disability variables. Researchers analyzed predictors of attendance (beginning college) and persistence, in relation to predictor variables suggested by the literature review. These included demographic and disability descriptive variables selected because of their role in prior studies. Predictor variables also included four factors derived from previous exploratory factor analysis on the same data set (see Schuck, 2015; Academic Achievement, Independence, Social Skills, and Non-Academic Skills). In addition, researchers included variables identified in adult outcome studies of individuals who had received special education services in high school (Test et al., 2009). Additional variables related to college and rehabilitation agency services were included in the analysis of persistence.

Demographic and disability descriptive variables included *Gender, Race, Urbanicity* (of high school), *First Generation Status*, and *Income*. Four variables in the analysis described disability features: *Braille, Large Print, O&M* (during high school), and presence of *Additional Disabilities*. *Gender* was a dichotomous variable. *Race* was recoded into four dichotomous variables, White, African-American,

Hispanic, and Asian/Pacific Islander/Alaska Native/ Native American/Multiracial/Other with white as the category of reference. *Urbanicity* of the participant's school was recoded for analysis into three dichotomous variables, rural, suburban, and urban. *First Generation Status* was a dichotomous variable. Student's Household *Income* was recoded into three dichotomous variables based on the NLTS2 categories: low ($25,000 or less), middle (more than $25,001 through $50,000) and high ($50,001 or more). Use of *Braille* (for the direct assessment), use of *Large Print,* receiving *Orientation and Mobility* (O&M) instruction from a school program and *Additional Disability* were dichotomous variables. The *Additional Disability* variable indicated whether the participant had at least one disability in addition to the educational diagnosis of visual impairment.

Home context -- parent expectations and family support. Values of the ordinal variable, *Parent Expectations (that participant would attend college)*, were 1 = definitely won't, 2 = probably won't, 3 = probably will, and 4 = definitely will. Initially this variable was coded for analysis as four dichotomous variables, but retaining the separate categories "definitely won't" and "probably won't" resulted in a quasi-complete separation of the data. Therefore, the researchers collapsed the two into one variable "will not." The researchers maintained the categories "probably will" and "definitely will" as independent dichotomous variables in order to preserve variation in the data. The scale variable *Student Support* was based on parent-reported family support, with values that ranged from 2 to 8.

Student skill areas -- independent living, academic, self-determination, social, and non-academic skills. Four of the student skill area variables used in the current analysis were identified in previous exploratory factor analysis (Schuck, 2015). These multi-dimensional factors represent latent constructs, derived from 17 independent variables in the NLTS2 data. The factors were *Academic Achievement* (representing 5 scale scores on *Woodcock Johnson III*; Woodcock, McGrew, & Mather, 2001), *Independence* (representing 4 scores of self-determination and self-advocacy), *Social Skills* (representing four scores on the *Social Skills Rating Scale*), and *Non-academic Skills* (representing four non-academic school activities, such as Fine Arts).

Two additional variables described student skill areas: high school *Grade Point Average (GPA)* and *Independent Living Skills*. *Independent Living Skills* was a composite factor comprising the sum of two other scale totals from the NLTS2 data. High school *Grade Point Average* was a variable found in the Transcript Summary.

Two employment related variables were used in the analysis: *Paid Work* and *Career Awareness*. *Paid Work* was found in the Wave 5 Parent/Youth Survey. *Career Awareness* was drawn from the Transcript Summary, identifying whether the student took a pre-vocational course in high school.

School program variables. Teacher-reported level of inclusion in general education was represented by a composite variable, *Inclusion*. The values of this scale variable were 0 (not included in any core subjects) to 4 (100% included; all 4 core subjects). Missing subject areas were recorded as 0 (not included in that subject). If two subjects were missing, the case was dropped from the analysis. The degree of interagency collaboration in the participant's individualized education planning (IEP) meeting had values 1 and 2: 1 = "school and parent only at meeting" and 2 = "school and parent with any number of additional service providers at meeting." Whether the student had a transition program had values 0 = "did not have a transition program" and 1 = "did have a transition program"

Sample Size for Variable Inclusion

College attendance data were recorded for 280 participants. Using a power of .8 and α of .10, a sample size of 210 would identify effects of .20 or smaller (Hulley et al., 2001). Variables with data on 210 or more participants were retained in the attendance analysis. *Student Support, Inclusion, Interagency Collaboration, and Transition Program*, were dropped from the attendance analysis at this point. Variables that remained (rounded to nearest 10 as per data use license) were *Grade Point Average* (*n* = 230), *Academic Achievement* (270), *Independence* (270), *Social Skills* (280), *Non-Academic Skills* (270), *Parent Expectations* (270), *Independent Living Skills* (280), *Career Awareness* (230), and *Paid Work* (280). Of these variables, six were continuous variables, one ordinal, and two dichotomous. Dummy variables were created for the one ordinal variable, *Parent Expectations*.

The persistence analysis incorporated dichotomous variables from the college context, including seeking academic help outside of formal supports provided by the college (*Got Help On Own*), disclosure of disability (*College Knew of Disability*), and use of academic services provided by the college (*Got Help from College*). *Got Help from College* combined those who received general academic help and those who received help from the service for students with disabilities. Finally, the analysis included three rehabilitation context variables: whether the student received *O&M After High School, Career Counseling,* or *Assistive Technology* provided by the rehabilitation agency.

Results

First, data were cleaned, and frequency distributions examined for the attendance and persistence analysis samples. Frequency data for the persistence analysis only are shown here, in Table 1. Among the 200 youth who had parent- or student-reported data on persistence, 170 also had parent-reported data on whether the youth had a secondary disability. Almost 50 of the 170 were reported to have a secondary disability in addition to a diagnosis of visual impairment. Table 2 below shows the frequency of additional disabilities as confirmed by parents. It is evident that at least some of the students have a visual impairment, ADHD, and a health impairment.

Sample means of continuous variables are found in Tables 3 and 4. Continuous variables were tested for evidence of collinearity. Tolerance and VIF statistics met the requirements to demonstrate little if any collinearity between the independent variables.

Weighting of Variables

It was necessary to weight the data due to the stratified, clustered study design of the NLTS2 and the under- or over-sampling of particular groups of participants. By weighting the data, final results reflected the proportions attributable to the actual population of blind/VI youth across the nation. Wave 2 direct assessment data weights were used for the analysis of attendance because the predictor variables were largely drawn from Wave 2, and Wave 5 weights for the analysis of persistence because both the outcome and many predictor variables were selected from Wave 5.

After forced entry of the independent variables, the researchers selected final logistic regression models based on the size and significance of estimated coefficients measured by Wald F statistics. None of the possible two-way interaction terms were statistically significant in the regression model at the level of α = .10 for both the attendance model and the persistence model. For the final models, the researchers retained variables whose Wald statistics were significant at the level of alpha = .10. The researchers determined the percentage of cases predicted by each model and assessed goodness of fit using Nagelkerke's *R* squared.

Analysis of Attendance

After a chi square analysis of attendance, the variables *Middle Income* (x^2=7.60, adj *F*=4.74, *p*=.03), *Rural* (4.84, 7.15, .01) and *Suburban Urbanicity*

(4.29, 4.98, .03), *Additional Disability* (16.04, 18.64, .00), and two levels of *Parents Expectations*, not (57.96, 67.52, .00) and will (26.48, 23.61, .00) were retained for regression analysis. Continuous variables *Academic Achievement, Independence, Social Skills,* and *Non-academic Skills, High School Grade Point Average* and *Independent Living Skills* were also used in the regression analyses.

The researchers experimented with a number of models of attendance. *Parents Expect Not to Attend, Academic Achievement,* and *Grade Point Average* were significant at α =.10 (actually even at .05) in our initial model and were retained for further exploration. *Academic Achievement* and *Grade Point Average* did not show multicollinearity when tested. In exploration of the regression solution, the exponentiated β of *Social Skills* was sometimes statistically significant, depending on other variables that were included in the model. Therefore, *Social Skills* was further explored in creation of the final model presented here.

Development of Final Model of Attendance

The final model accounted for 40.1% of the variance (Nagelkerke's *R* squared = .401), correctly predicting group membership 86.9% of the time (attendance 95.8%, non-attendance 41.6%). Youth whose parents expected them to attend college (i.e., did not expect them not to attend, as the question was worded) were more likely to attend college by almost eight times (Wald = 9.43, *p* = .003, Exp (β) = 7.72). Grade Point Average ranged from 0.879 to 4.000 in this sample, with a possible range of 0 to 4.000. For every one-point increase in grade point average, youth were 1.18 times more likely to attend college (Wald = 7.12, *p* = .010, Exp (β) = 1.18). The values of the Academic Achievement factor varied from 122.89 to 591.74 in this sample, but had a possible range from zero to 834. For every one-point increase in the value of the Academic Achievement factor, the likelihood of attendance increased slightly, just one percent (Wald = 4.85, *p* = .031, Exp (β) = 1.01). To look at this measure another way, every 100-point increase in the Academic Achievement factor results in a 100% increase or doubling of the likelihood of attendance. Finally, youth with higher scores in Social Skills were slightly more likely to attend college. The social skills variable ranged from 5.63 to 15.94 in this sample, but the factor has a possible range from 1.29 to 15.94. For every one point increase in the value of the Social Skills factor, youth were 1.21 times more likely to attend college (Wald = 2.785, *p*= .100, Exp (β) = 1.205). This variable was included in the final model, although it is on the borderline of a Type 1 error, at α = .10. The final model is shown in Table 5.

Analysis of Persistence

College persistence data were recorded for 200 participants. Using a power of .8 and α =.10, a sample size of 150 would identify effects of approximately .20 or less (Hulley et al., 2001, p. 89). This is about 75% of the total *n*. Because of sample sizes of less than 150, *Student Support, Inclusion, Interagency Collaboration,* and *Transition Program* were dropped from the analysis at this point. Variables that remained with sample sizes over 150 were *Grade Point Average, Academic Achievement, Independence, Social Skills, Non-Academic Skills, Parent Expectations, Independent Living Skills, Career Awareness, Paid Work, Career Counseling, Assistive Technology, O&M From Rehab, Got Academic Help from College,* and *Got Help On Own* (not from college academic services).

After a chi square analysis of persistence, the categorical variables *Large Print* (x^2 = 7.00, adj *F* = 5.91, *p* = .02), *Got Help on Own* (x^2 = 13.87, adj *F* = 10.08, *p* = .00) and *Other Race* (x^2 = 2.56, adj *F* = 3.45, *p* = .07), and *Additional Disability* (x^2 = 6.81, adj *F* = 4.61, *p* = .04) were retained for regression analysis. Continuous variables *Academic Achievement, Independence, Social Skills,* and *Non-academic Skills, High School Grade Point Average* and *Independent Living Skills* were also used in the regression analyses. The sample size of our final model was 150. Two-way interaction terms were tested among the variables that were significant in the initial model. None of the two-way interaction terms proved to be statistically significant in an intermediate model.

Development of Final Model of Persistence

In exploratory models, *Independent Living* shifted widely depending on what other variables were included in the model, but *Additional Disability* remained more stable. For that reason, *Additional Disability* was retained for the final model, but *Independent Living* was removed from the model. The final model is shown in Table 6.

The final model accounted for 22.4% of the variance (Nagelkerke's *R* squared = .224). This model correctly predicted group membership 71.3% of the time (persistence 84.2%, non-persistence 57.9%). Three variables had positive effects on the outcome of college persistence. A student who was recorded as having an additional disability was more than twice as likely to persist to 30 credits as a student who did not report an additional disability (Wald = 4.21, *p* = .045, Exp (β) = 2.41). A student who used large print to take the direct assessment was three and a half times as likely to persist than a student who was not reported to use large print (Wald = 4.43, *p* = .040, Exp (β) = 3.56). A student who reported getting help with

academics outside of the formal supports offered by the college was four times as likely to persist (Wald = 10.61, p = .002, Exp (β) = .04). It should be noted, however, that the variable *Additional Disability* was not statistically significant in intermediate models. The variable was retained in the final model because it was stable and significant in most of the exploratory modelling performed to create the final model.

Discussion and Recommendations for Further Research

The participants in this study had taken a direct assessment of self-determination, self-concept, and academic achievement as a part of the second wave of data collected by the NLTS2. This inclusion criterion limited study participants to blind/VI youth whose functional abilities would allow them to reliably express answers to questions and to read independently (Wagner et al., 2006), creating a group of participants that were expected to be able to perform academically, with or without additional disabilities. Among these participants, 80.6% went on to attend at least one college class. This is a larger percentage than has been estimated by other studies, but no comparisons have previously been made using this particular cohort that eliminated students with additional disabilities who were unable to take an assessment of reading and other academic skills. Three features of each student's data helped to predict attendance. These were parent expectations, academic skills, and social skills. If a parent's expectation that the youth would not attend college was zero, that is, if the parent expected the youth would attend college, the participant was almost eight times as likely to attend college. Two indicators of academic skills, High School Grade Point Average and the Academic Achievement factor, both had small predictive effects on the outcome of college attendance. Finally, the measure of social skills had a small but statistically significant effect on college attendance among blind/VI youth. The influence of the social skills variable, however, should be considered in light of its shifting significance level in the models as other variables were eliminated.

In 2009, 53.8% of all college students who entered a four-year institution in 2009 went on to complete a degree in the same university (USDOE, 2017). In contrast, a similar percentage (i.e., 52.6%) of the students who are blind/VI in the present study who started college persisted to earn 30 credits, attaining just sophomore status. It is very difficult to determine how many of the students in the present study sample went on to complete college, but at sophomore year, there were already fewer than the general population of college students. Presumably, fewer would complete a degree. In spite of the financial assistance that may be provided through rehabilitation agencies, almost half of students who are blind/VI "stop out" or drop out of college before attaining a degree.

In the regression model of persistence to 30 credits, two variables were stable and contributed to the results: using large print and getting academic help outside of services provided by the college. Using large print might indicate better vision throughout the elementary and high school years, contributing to the positive result. These two variables were statistically and practically significant in their positive effect on college persistence of students who are blind/VI.

The results indicate that different factors may be associated with lack of persistence for blind/VI youth compared to youth in the general population. Demographic variables are often associated with lower academic achievement for youth with disabilities, such as race (Benz et al., 1997; Peter & Horn, 2005; Rodriguez & Cavendish, 2012) and first-generation status (Lombardi et al., 2012). These did not correlate to college attendance among students who are blind/VI in chi square analyses. This may indicate that special education and rehabilitation agencies are uniformly serving youth regardless of these factors. For some youth who are blind or have visual impairments, the individualized approach and specialized resources might provide support that helps the student to overcome factors that usually predict non-persistence.

As observed by others, parent expectations form a complex construct (Chiang, Cheung, Hickson, Xiang, & Tsai, 2012; Powers, Geenen, & Powers, 2009; Rodriguez & Cavendish, 2012). Parent expectations may increase with the expanding skills of a young person reaching adulthood, but may be affected by the type of disability. Blindness and visual impairment might also have a complex relationship with parent expectations. In fact, the type of disability acted as a moderator between expectations and outcomes in the findings of Doren and colleagues (2012). If having low vision and having no vision at all are considered separately as different disabilities, the degree of vision loss may have the same moderating effect between parent expectations and the outcome of college attendance. However, the NLTS2 did not provide a comprehensive view of the reading media of youth who have visual impairments. Degree of vision loss and similarly, presence of additional disabilities are characteristics worthy of further research. For example, parent expectations have been found to moderate positive outcomes among youth with autism (Chiang et al., 2012). Given that more than 6% of blind children also have autism (Baio, et al., 2014), there may

be important information to be gained by looking at the two disabilities together. The finding of the importance of parent expectations for student success supports the findings of other researchers (Lombardi et al., 2012; Pascarella et al., 2004).

In the NLTS2 data collection, two questions asked if students had received help from disability services or general help with schoolwork not based on disability. A third question asked if students found academic help elsewhere, that is, got help on their own outside of any campus-based services. One of the most interesting aspects of the present study is that independent help-seeking behavior (i.e., a positive answer to the question, *Got Help on Own*) had a large effect size in the final model. Independent help-seeking behavior may function as part of the construct of self-determination, but in this study, *Got Help on Own* was part of a series of questions that investigated student use of various sources of academic help. This variable was not gathered as part of the self-determination scale embedded into the NLTS2. Students who persisted to sophomore year were four times as likely as those who did not persist to find academic help somewhere other than through formal supports offered by the college. This is positive, as it points to the potential value of teaching students specific strategies and behaviors for seeking out help on their own. If help-seeking behavior is viewed as a self-determination skill, this study confirms prior research regarding college attendance and persistence for students with disabilities as a larger group, which did not disaggregate or include blind students (e.g., Getzel & Thoma, 2008).

Although self-determination skills (as represented by the *Independence* factor) did not emerge as significant in the model, the ability to find academic help independently could be an aspect of self-advocacy, a critical element among self-determination skills. Further research into independent help-seeking instruction is needed. Further analysis using the same NLTS2 data, might also shed light on self-advocacy as a potential mediator of the effect of independent help-seeking on persistence. This would have to be performed with a larger population from within the NLTS2 data set, for instance with all participants, with any disability, who attended college.

The sample for this study included only students who had taken the Woodcock Johnson III assessment, indicating that they were capable of answering questions and expressing themselves in written form. This study used the students' cumulative high school grade point average, and the results of the Woodcock Johnson III, as measures of academic skills levels. The two variables performed similarly in the regression model. Further research could add to our understand-

ing of the value of the GPA for predicting student attendance in college.

Several factors were derived in previous analysis (see Schuck, 2015) from the results of the NLTS2 version of the Woodcock Johnson assessment in combination with observations of parents. Rehabilitation counselors may be able to use the results of this assessment in college preparatory programs for blind/VI youth. For example, rehabilitation counselors might use the same parent-reported measure of social skills that was used in the NLTS2 direct assessment. A single assessment should not by any means be used to deny youth an opportunity to attend college, but may be useful to identify students who could benefit from extra support services, tutoring, or pre-college preparatory experiences.

Neither use of braille nor use of large print correlated with college attendance in chi square analyses, that is, there is not a strong relationship between these variables and attendance. Once attending, reading medium was associated with persistence. However, the reading media variables in this study were based only on the medium used for the direct assessment in the NLTS2. Some students use various media, including large print, audio, and braille, selecting a particular medium for each task in school. Research into the reading media selected by college students who are blind/VI is recommended to look at the next stage of education beyond high school.

Fewer than 50 of the approximately 200 students who were in the sample were confirmed by parents to have an additional disability. In addition, there may be others with additional disabilities, or undiagnosed additional disabilities, that were not confirmed by a parent. Having an additional disability had an unexpected positive effect on the likelihood to persist in college. The unexpectedness of this finding raises questions about the construction of the variable, or whether multiple disabilities actually play a role in college persistence. Students who have an additional disability were almost two and a half times as likely to persist as those who do not have an additional disability. This is counter-intuitive and contradicts the findings of Fichten and her colleagues (2016) among Canadian college students. The result may indicate that youth in high school who learn compensational strategies for learning disabilities and ADHD go on to use these strategies in college and are successful.

In considering this result, the composition of the sample is critical. The inclusion criterion of participation in the Wave 2 general assessment, including the Woodcock-Johnson academic assessments limited the sample to those who could perform academically and answer questions about themselves and their ex-

periences, regardless of the presence of any additional disability. Given their ability to take the assessment, participants with an additional disability may have had a milder disability. Results of the present study may indicate that students who have both a visual and a secondary impairment are more likely to seek out support services or help from family or friends, and then to persist.

However, it is also important to consider this result in light of its instability in the models and its relationship to independent living skills. Level of independent living skills and presence of and additional disability might be expected to vary inversely. In addition, of the students who had additional disabilities, 56% had a health impairment which could include diabetes or multiple sclerosis, in which vision loss sets in later in high school or young adulthood. Students may have had the benefit of using regular sized print and visual materials through school. Given the expected inverse variation and the high percentage of participants that had a health impairment, independent living skills and additional disability variables should be explored in a mediation analysis.

This study adds to the literature because it disaggregated blind youth, but also because it disaggregated the blind youth who were able to take the direct assessment from those who were not able to take it. This separation based on the ability to take the assessment produced a sample of students who presumably could do academic work, leaving out students with severe or multiple disabilities. This approach may be helpful for future NLTS2 analyses.

Limitations

Among limitations to the study, data collection began approximately fifteen years ago. Regulations surrounding transition planning and services changed after IDEA 2004. Younger youth in the study may have been disparately affected by the changes, but age was not used as a covariate in this study because the direct assessment was performed when youth were of similar ages.

Students who used large print to take the direct assessment were 3.5 times as likely to persist to 30 college credits as students who did not use large print. The data did not identify audio or regular-size print users. Generalizability of the results of the present study is limited by the disability descriptors chosen by the designers of the NLTS2. A spectrum of reading media is used by individuals who are blind/VI, and one individual may use several media, depending on the device being used. Persistence should be explored with this range of media choices in the future.

The results of this study indicate that a student with an additional disability is 2.4 times as likely to persist as one whose only disability is blindness, which is an unexpected result. The small sample size could have affected this result. Students who used large print to take the direct assessment recorded were 3.6 times as likely to persist. Finally, finding help outside of college—provided academic supports was associated with a student being four times as likely to persist to 30 credit hours. All of these results would be stronger if confirmed with larger samples, which may be possible in the future, but the NLTS2 offered an opportunity to study the first reasonably large longitudinal data set and was the best available at the time.

Conclusion

In light of the strong effects of parent expectations on attendance and of independent help-seeking on persistence, it may be necessary to systematically address the expectations of parents and self-determination in college within professional personnel preparation programs at the university level. Parents may be the most able to identify whether their children might succeed in college, and this knowledge may drive the child's own expectations. However, high school teachers of blind/VI youth may be able to show parents with lower expectations that their children have capabilities that will allow them to succeed in college. Teacher education programs should build in discussions of ways to increase youth skills, but also to raise parent expectations of what individuals who are blind/VI can achieve. Such discussion might also promote high expectations among pre-service teachers of blind youth. When a student visits the college campus and the office of services for students with disabilities, a disabilities professional may also be able to help parents to be optimistic and have high expectations of their high school age children who are investigating college education. Disabilities services professionals should continually communicate their expectations that all students can succeed.

The strongest predictor of persistence, getting academic help outside of college services, may be likened to a measure of self-advocacy and using effective help-seeking behaviors. The transfer from a parent-driven factor to a student-driven factor is analogous to the process that youth go through to separate from family and become independent adults. For professionals who work with students who are blind/VI, this study points to the development of independent, help-seeking skills as an important feature of pre-college training programs in high schools and vocational rehabilitation programs. Students need to learn to

brainstorm solutions and find resources to support their own learning whether or not the college provides adequate services. Offices who serve students with disabilities on campus should go beyond ADA compliance to help students who are blind/VI, and indeed all students with disabilities, to develop appropriate help-seeking skills that will carry over into adult employment and other settings. As expectations rise and students learn to seek help on their own, students who are blind/VI may be more likely to complete college and move on to independent employment.

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Table 1

Frequencies of Categorical Variables for Persistence Analysis

		Percent that Persisted		
		Unwtd	Wtd	SE
All respondents (*n*=200*)		47.1	52.6	6.6
Gender (*n=180*)	Male	45.3	61.0	6.1
	Female	49.4	44.0	10.4
Additional Disability (*n=180*)	No	47.6	46.5	8.3
	Yes	46.3	68.2	6.9
Race/Ethnicity (*n=180*)	White	49.2	51.9	8.1
	African-American	32.3	48.6	10.0
	Hispanic	55.0	65.3	16.4
	Asian/Pac Isl/AK Native/ Native Amer/Multi/Other	66.7	14.2	14.5
Income (*n=170*)	Low<25000	36.8	49.4	10.3
	25000< Middle<50000	52.9	60.0	9.5
	50000<High	48.8	49.4	9.6
First Generation Status (*n=170*)	No	50.9	60.0	5.2
	Yes	40.7	39.7	11.3
Braille (*n=180*)	0 No	47.8	49.0	8.1
	1 Yes	45.4	64.2	6.9
Large Print (*n=180*)	0 No	46.6	47.0	6.9
	1 Yes	48.4	70.2	8.1
OM services (*n=200*)	0 No	45.1	46.4	9.7
	1 Yes	50.0	59.4	6.1

Continued

Urbanicity (*n*=170)	Rural	46.7	62.0	10.8
	Suburban	46.4	57.9	8.1
	Urban	51.4	58.4	9.2
Parent Expectations (*n*=170)	Definitely Will Not	100.0	100.0	0.0
	Probably Will Not	75.0	82.3	14.3
	Probably Will Attend	42.2	50.8	11.3
	Definitely Will Attend	47.5	51.4	7.7
Career Awareness (*n* =150)	No	49.4	51.3	8.2
	Yes	45.3	51.4	10.1
Transition Program (*n* =140)	No	30.0	42.3	12.8
	Yes	44.1	43.0	8.7
Paid Work in High School (*n* =180)	No	47.1	54.5	9.0
	Yes	46.8	50.6	7.8
Assistive Technology After HS (n =180)	No	41.8	44.7	8.1
	Yes	50.5	56.0	7.9
Career Counseling After HS (*n*=180)	No	48.1	52.4	7.5
	Yes	46.0	52.7	9.7
College Knew of Disability (*n*=120)	No	50.0	60.3	21.3
	Yes	47.7	50.0	6.8
Got Help on Own (*n*=150)	No	42.5	35.6	7.5
	Yes	54.9	65.9	8.1

Note. * All unweighted *n* rounded to nearest 10 as per restricted-use data license

Table 2

Additional Disability Confirmed by Parent (n < 50)

Parent-confirmed additional disability	Frequency	% with disability that persisted
ADHD	47.9	43.4
Autism	0.0	NA
Deaf/blind	0.0	NA
Developmental delay	8.3	50.0
Down Syndrome	0.0	NA
Emotional Behavioral Disorder	0.0	NA
Health Impairment	56.25	40.7
Hearing Impairment	0.0	NA
Learning Disability	22.9	54.5
Mental Retardation [sic]	2.1	100.0
Multiple impairments	0.0	NA
Physical or orthopedic impairment	20.8	50.0
Speech impairment	2.1	100.0
Traumatic brain injury	2.1	100.0

Table 3

Distributions of Continuous Variables —Attendance Model

	Mean	Standard Error	Range Minimum	Maximum
Academic Achievement (270*)	388.07	5.32	122.89	591.74
Independence (270)	102.03	0.72	68.35	124.63
Social Skills (280)	12.59	0.14	5.63	15.94
Non-Academic Skills (270)	7.10	0.09	3.63	10.20
Independent Living Skills (280)	17.46	0.21	7	zt 24
Grade Point Average (230)	3.01	0.07	0.879	4.000

Note. * All unweighted *n* rounded to nearest 10 as per restricted-use data license

Table 4

Distribution of Continuous Variables – Persistence Model

	Mean	Standard Error	Range	
			Minimum	Maximum
Academic Achievement (200*)	401.49	5.67	122.89	591.74
Independence (200)	101.74	0.80	68.35	123.12
Social Skills (200)	12.98	0.16	5.63	15.94
Non-Academic Skills (200)	7.18	0.12	3.65	10.20
Independent Living Skills (200)	17.62	0.26	11	24
Grade Point Average (170)	3.07	0.06	0.879	4.00

Note. * All unweighted *n* rounded to nearest 10 as per restricted-use data license

Table 5

Model of Attendance

	Sig	95% Confidence Interval		
		Lower	Exp(β)	Upper
Intercept	.01	0.00	0.00	0.01
Parents Expect Youth prob or def will NOT attend				
Yes (Ref)				
No	.00	2.04	7.72	29.23
Academic Achievement	.03	1.00	1.01	1.02
Social Skills	.10	0.96	1.21	1.51
Grade Point Average	.01	1.18	1.93	3.16

Table 6

Model of Persistence

Paremeter	Sig.	95% Confidence Interval		
		Lower	Exp(β)	Upper
Intercept	.11	1.96	10.67	58.26
Presence of Additional Disability				
No (Ref)				
Yes	.05	1.02	2.41	5.68
Used Large Print for Assessment				
No (Ref)				
Yes	.04	1.06	3.56	11.91
Got Academic Help Outside of Formal Services				
No (Ref)				
Yes	.00	1.71	4.04	9.53

Self-Determination of College Students with Learning and Attention Challenges

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Abstract

Among students with disabilities, the largest two groups in postsecondary educational settings are students with specific learning disability (SLD) and students with attention deficit hyperactivity disorder (ADHD). These students can experience difficulty in achieving goals in academics and their personal lives. At the University of Arizona, the Strategic Alternative Learning Techniques Center provides comprehensive services for approximately 600 students with learning and attention challenges. This study aimed to explore students' perceptions of self-determination to improve the quality of departmental programing with better preventions and interventions. The AIR Self-Determination Scale was completed by 641 participants. Using both quantitative and qualitative methods, the research team gained an in-depth understanding of the enrolled students. Overall, most students viewed themselves as *sometimes* performing self-determined behaviors and *almost always* to *always* provided opportunities. Moreover, they had a high level of *Thinking* and medium level of *Doing* and *Adjusting*. When comparing students by gender, ethnicity, and disability groups, female students' perceptions of self-determination were significantly higher than male students; no significant differences across ethnicity categories were found; SLD group's rating was the highest. Adopting a general inductive approach, three main themes, *Academic Goals, Health Goals, and Employment* and *Finance Goals*, were identified. Awareness of different demographic groups, myth busting, and supports were also discussed to provide useful strategies for college students with learning and attention challenges.

Keywords: self-determination, postsecondary, learning and attention challenges, SLD, ADHD

The numbers of students with disabilities who graduated from high schools have been increasing for the past decade. For example, between 2002–2014, 14% increase of students with a specific learning disability (SLD) received a high school diploma (57% in 2002 versus 71% in 2014) (National Center for Learning Disabilities [NCLD], 2017). More and more students with disabilities continue their education in postsecondary educational settings (Eckes & Ochoa, 2005; U.S. Department of Education, 2011). According to the most updated 2011-2012 report from U.S. Department of Education (2014), more than 10% of students in postsecondary education had a disability; among these, the largest two groups included students with SLD (31%) and students with attention deficit hyperactivity disorder (ADHD) (18%). However, when researchers investigated students' academic achievement, only 41% of students with SLD completed any type of postsecondary education in 2011

(NCLD, 2014). Also, students with ADHD had significantly lower GPAs (Advokat, Lane, & Luo, 2011; Blase et al., 2009) as well as had higher dropout rates when compared to peers without disabilities. Additionally, these two groups of students (SLD and ADHD) usually took longer to complete bachelor's degree (Richman, Rademacher, & Maitland, 2014).

Importance of Self-Determination

Self-determined behavior is defined as "volitional actions that enable one to act as the primary causal agent in one's life and to maintain or improve one's quality of life" (Wehmeyer, 2005, p. 117). The actions include four elements: (a) autonomy, (b) self-regulation, (c) psychological empowerment, and (d) self-realization (Wehmeyer et al., 2011). Once an individual is a causal agent, he/she can accomplish specific goals, which the person hopes to pursue in

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life. Studies show that successful students with SLD demonstrate strong self-determination skills, and they practice more goal-oriented actions and are more self-aware (Richman et al., 2014; Wehmeyer, 1996).

Promoting self-determination has been considered as an effective approach to improve students' executive functioning skills as well as self-regulation (Field, Sarver, & Shaw, 2003; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013). Several empirical studies explored the self-determination and academic experiences of postsecondary students with disabilities (Anctil, Ishikawa, & Scott, 2008; Getzel & Thoma, 2008; Ju, Zeng, & Landmark, 2017; Skinner, 2004). The results demonstrated that self-determination skills are important to achieve their academic success in postsecondary education. For example, Skinner's study (2004) interviewed 20 graduated college students with SLD and clearly indicated 7 variables which contributed to academic success, including accessing accommodations, understanding of psychoeducational evaluation, knowledge of disability law, use of self-advocacy skills, utilizing support systems, an attitude of perseverance, and goal setting skills. In Anctil et al.'s qualitative study (2008), 19 college students with SLD stated that self-determination supported their academic identity development as well as improved their ability to obtain academic accommodations. In Getzel and Thoma's focus group study (2008), 34 college and university students with disabilities identified key component skills of self-determination as being essential for their success (e.g., problem solving, self-awareness, goal-setting) and for staying in college and obtaining needed supports (e.g., seeking service on campus, forming relationships with professors and instructors).

Researchers also highlighted the need for interventions to foster self-determination due to the improvement of self-determination connected to more positive academic and transition outcomes (e.g., Fowler, Konrad, Walker, Test, & Wood, 2007; Lee, Wehmeyer, Soukup, & Palmer, 2010). Teaching decision making to promote self-determination has been highly recommended both at the secondary and the postsecondary level (Durlak, Rose, & Bursuck, 1994; Hoffman, 2003; Ju et al., 2017; Mull, Sitlington, & Alper, 2001). Students with disabilities benefit from having knowledge of support services and how to access them when needed. Other evidence-based interventions, such as coaching services (Parker & Boutelle, 2009; Richman et al., 2014), personal strengths programs (Farmer, Allsopp, & Ferron, 2015), and self-advocacy training programs (Walker & Test, 2011; White, Summer, Zhang, & Renault, 2014) have also been proved to increase participants'

self-awareness, autonomy, goal-attainment level, and self-advocacy about disability knowledge and requesting accommodations.

Role of the Academic Support Program

All universities that receive federal financial support must also have a disability resource office. This office's mission is driven by Section 504 of the Rehabilitation Act of 1973 (1973) and the American with Disabilities Act of 1990 (1990). The purpose of this office is to facilitate the process to provide equal access to curriculum, activities, and campus life for students, staff, and faculty. As a best practice, disability resource offices promote the implementation of universal design when working with instructors to design their courses (Smith & Buchannan, 2012; Zeff, 2007). This office is also responsible to determine eligibility and to coordinate the delivery of academic accommodations for students free of charge. Some of these accommodations include sign language interpreting, real-time captioning, audio recording, extended exam time, alternative exam formats, and assistive technology (Dallas, Upton, & Sprong, 2014; U.S. Department of Justice, 2010; Zeff, 2007). According to an NCLD (2014) report, 94% of students with SLD received accommodations and supports in high school settings; however, only 17% of them accessed these services in postsecondary education settings.

In addition to the disability resource office, most postsecondary institutions also have a learning center where tutoring, educational planning, and workshops may be available to all enrolled students, which may be free or low cost. Although comprehensive in nature, these services may not be adequate for students with SLD and/or ADHD due to complex needs of the student. Thus, the necessity for a comprehensive academic support program specifically designed for college students with learning and attention challenges has become increasingly more popular at college campuses across the US.

SALT Center at UA

The Strategic Alternative Learning Techniques (SALT) Center focuses on students with learning and attention challenges and annually provides comprehensive services for approximately 600 students at the University of Arizona (UA) in Tucson. The SALT Center's mission is to inspire students to succeed in higher education and facilitate learning, self-advocacy, and independency by empowering students to take ownership of their education. The philosophy embodies the belief that learning involves the process of identifying one's strengths and weaknesses, learning preferences, and creating strategies

that will enable one to be successful. To improve the quality of programming and support students to meet their postsecondary environmental needs as well as encourage student engagement, self-awareness, and growth, the center offers support based on a student-centered model. The main services include four domains: (1) educational planning with a professional student support specialist, (2) content specific tutoring, (3) educational technology support, and (4) in-house psychological services.

The Present Study

To date, students with learning and attention challenges are usually considered as a marginalized or invisible population in postsecondary educational settings (Connor, 2012; Mullins & Preyde, 2013). Few researchers have investigated self-determination and explored goals among college students with learning and attention challenges. Zero studies were identified that a comprehensive academic learning center for students with SLD and ADHD used self-determination as a framework. This study aimed to gain perspective on students' perceptions to explore the possibility of using self-determination as a foundational concept in which to support current practices and identify new programs and services for college students who learn differently.

When students entered the SALT Center, the first step was to gather information about their goals, learning styles, strengths, weaknesses, and learning challenges along with current semester needs. The data collection was designed to help build knowledge and start conversations between students and their assigned student support specialist. To achieve these purposes, the research questions included: (a) How did students view their self-determined behaviors? (b) Did students with different gender, ethnicity, and disability demonstrate different degree of self-determination? (c) What were their goals that they planned to achieve when they entered the program?

Method

Research Design

To investigate and explore what students experienced, the researchers employed a mixed methods research design. Using both quantitative and qualitative methods, the research team were afforded the opportunity to gain more in-depth understanding of student perceptions from deductive and inductive ways (Creswell & Plano Clark, 2011). Quantitative data was first reported, including descriptive and inferential results, followed by both qualitative themes and occurrences of identified categories in a qualitative dataset. This integration of combining both types of datasets would be displayed (e.g., text and numeric information), and the research results will be discussed comprehensively.

Participants

To be included in this study, students (a) were enrolled at the UA as a first-year college student; (b) were enrolled in the SALT Center, and (c) self-identified as having a learning and/or attention challenge. The participants included 374 (58.3%) male and 260 (40.6%) female students, with 7 (1.1%) students who did not disclose their gender. White students (made up the majority of all students (79.5%), other ethnic groups accounted for 20.5%, and 1.9% of the students did not disclose their ethnicity in this study. Disability status was optionally disclosed in the survey by students' willingness, and approximately 34.6% of participants chose not to disclose. The largest group was students with ADHD (28.9%), and the students with SLD were accounted for 17.6%. Students with comorbidity had SLD and/or ADHD characteristics combined with other disorders, such as ADHD with SLD, SLD with anxiety, and ADHD with SLD and depression, were accounted for 16.1%. Others, such as autism spectrum disorder, obsessive compulsive disorder, were 2.8% of all participants. The mean high school GPA was 3.02 ($n = 641$). A total of 641 students participated in this study that took place between spring semester of 2013 and fall semester of 2016, including year 2013 ($n = 170$), year 2014 ($n = 180$), year 2015 ($n = 187$), and year 2016 ($n = 104$) (see Table 1).

Data Collection

Procedure. Survey data were collected for two purposes: (a) to inform the student's support specialist about the students' academic needs and background; (b) to perform department wide analysis on the trends of each cohort. Upon Institutional Review Board exemption, the research team began the study in 2013. Prior to a student's fall enrollment, most participated in a one-and-a-half-day University orientation. The optional survey was administered on the first day by a SALT Center professional. Students were allotted approximately 30 minutes to complete the survey. Students who decided to opt out of the study were given an alternative activity, which was to learn more about strategies related to time management, notetaking, and other academic skills.

AIR Self-Determination Scale. As part of the learning survey, students completed the AIR Self-Determination Scale–student form (AIR Scale; Wolman, Campeau, DuBois, Mithaug, & Stolarski, 1994)

and a several demographic prompts. The AIR Scale was selected for this study because (a) it measures global self-determination; (b) it is a widely and freely available online tool; (c) it has been designed to be administered by multiple stakeholders, including educator, student, parent, and research, depending on the different research requirements; and (d) researchers can collect both qualitative and quantitative data for comprehensive exploration. In this study, the qualitative investigation was to identify students' current goals. One main question was answered by all participants: Give an example of a goal you are working on now. The quantitative data collected was to examine students' self-determination. The student form of the AIR Scale includes 24 items divided into two domains: *Capacity* and *Opportunity* (see Table 2). Each domain has two sub-scales which include six items individually. All four sub-scales are comprised of three different components: *Thinking, Doing,* and *Adjusting.*

Using a 5-point Likert-type scale (1=never, 2=almost never, 3=sometimes, 4=almost always, 5=always), the AIR Scale has been developed with strong psychometric properties (Carter, Trainor, Owens, Sweden, & Sun, 2010; Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2003). Previous studies further suggested that the scale can be appropriate for youth with high-incidence disabilities (Carter, Lane, Pierson, & Glaeser, 2006; Shogren et al., 2008).

The scale manual (Wolman et al., 1994) showed the self-determination difference from initial study results. For example, based on gender and ethnicity, no significant differences were shown in self-determination of the participants. However, students with disabilities had a significantly lower rating of self-determination than students without disabilities. Students with mild disabilities had a significantly higher rating of self-determination than students with moderate to severe disabilities. According to the scale manual, reliability tests on the AIR Scale indicated a strong item consistency (.91–.98), high internal consistency (.95), and adequate test–retest reliability (.74 tested after three months). With the present samples, the researchers conducted reliability analysis for this current study using Cronbach's alpha for the entire AIR Scale. The alpha value of the entire scale was .901, indicating excellent internal consistency.

Quantitative Data Analysis

For quantitative analysis, descriptive analyses were first conducted for showing group demographics and mean scores of overall and sub-scales of the AIR Scale. The Pearson's Product-Moment Correlation was computed to examine the correlations across means of sub-scales. The coefficient value between $\pm$ 0.50 and $\pm$ 1 was considered a strong correlation; the value between $\pm$ 0.30 and $\pm$ 0.49 was seen a medium correlation; the value below $\pm$ .29 showed a small correlation. For investigating comparisons among means of subscales, paired sample t-test was employed to compare between means of *Capacity* and *Opportunity,* and repeated measures ANOVA was administered to compare means of *Thinking, Doing,* and *Adjusting.* For exploring comparisons among means of groups across sub-scales, paired sample *t*-test was employed for gender groups, and one-way ANOVA was used to compare ethnicity and disability groups. Effect size was calculated for interpreting the magnitude of standardized mean difference. According to Cohen's (1988) suggestion, the standardized mean differences of $d = 0.2, 0.5, 0.8$ and the proportion of the variation $\eta^2 = 0.01, 0.06, 0.014$ indicated small, medium, and large effects, respectively.

Qualitative Data Analysis

After the 24 item Likert-scale prompts, students were prompted to complete three open-ended prompts that were included in the AIR scale. For purposes of this study only the first prompt was analyzed. It read, "Give an example of a goal you are working on now." The coding and analysis of the first cohort was completed at the midpoint of the study, then the remaining cohort responses were analyzed as they were submitted each year. The reliability of the themes was reinforced by triangulating codes from multiple coders. The coding team consisted of three coders who participated in the research team periodically. The research team used the responses from the first cohort to establish the code and thematic foundation, which aided in the categorizing of the remaining cohort responses. The coders educational experiences were extensive and diverse. The first coder was a graduate assistant with a special education background, mainly responsible for managing the coding process. The second coder was the director of the SALT Center, supervising the weekly progress and the management of the overall study. The third coder was a graduate assistant with information system background, mainly responsible for the data visualizations and pulling data from university systems. The three coders provided insight on the codes and themes from multiple perspectives, which led to the refinement of the coding system.

A general inductive approach (Thomas, 2006) was conducted for analyzing and interpreting the data. The purpose for using this approach was to condense raw qualitative data into clear and brief findings in the context of the focused question. The general inductive approach allows the phenomena or underly-

ing sentiments within the data to rise to the surface. A five-phase analysis was employed, including four phases for identifying themes and the final phase for counting the occurrence of the categories and themes:

1. During the first phase, three coders separately read the raw textual data.
2. Second, all coders collaborated to explore patterns, reoccurring ideas, and generate as many codes as needed.
3. Third, the textual data was gradually condensed through discussion. Codes which were conceptually similar were collapsed into one another under tentative categories through a display of a diagram, which helped examine structure into a compact format (Huberman & Miles, 1994).
4. Fourth, the first and second coder, those who were most familiar with students enrolled in the SALT Center, collaborated and used a constant comparison procedure to refine categories by deleting or adding categories for the clarification until codes became saturated (Charmaz & McMullen, 2011; Corbin & Strauss, 2008; Merriam, 1998). When they had different opinions, the third coder provided her comments and insights. After making changes, a reconciled list of open codes was produced. The emerging themes were then determined to be representatives of students' goals.
5. At the final stage, the principle coder counted the occurrence of categories and themes as well as created visualization data.

Quantitative Results

How Did Students View Their Self-Determined Behaviors?

Overall. Students rated their perceptions of being self-determined as ranging from *sometimes* to *almost always* (M = 3.86, SD = .49) (Table 3). Students' ratings were then divided into three levels to explore the percentage of each level: (a) low level, *never* to *almost never*; (b) medium level, *sometimes*; and (c) high level, *almost always to always*. The largest proportion of students (52.2%) rated themselves on the medium level of self-determination. In subscales, a medium level of *Capacity* (61.3%) and a high level of *Opportunity* (57.9%) consisted of the largest percentage of students. The results showed that most of students viewed themselves to *sometimes* perform self-determined behaviors and *almost always* to *always* had been provided opportunities. High level of *Thinking*, medium level of *Doing*, and medium level

of *Adjusting* had the largest groups of students, indicating that most of the students viewed themselves as *almost always* to *always* to think and *sometimes* do and adjust when performing self-determined behaviors (see Table 4). The results regarding two domains of self-determination (i.e., *Capacity* and *Opportunity*) and three stages of self-determination process (i.e., *Thinking, Doing*, and *Adjusting*) were addressed as follows.

Capacity and opportunity. Students *sometimes* to *almost always* explored their knowledge, abilities, and perceptions that enable self-determination and feel good about it (i.e., *Capacity*) (M = 3.69, SD = .55) and *almost always* had opportunities to engage in self-determination behaviors (i.e., *Opportunity*) (M = 4.03, SD = .57). Students' average perception of *Opportunity* was significantly higher than *Capacity,* $t(641) = 15.69, p < .01, d = .61$, referring that students had strong support at school and/or home to achieve their goals compared to their perceptions about their own ability to set, pursue, and achieve their desired goals (Table 3).

Compared with the sub-scales of *Capacity,* the result showed that students had a significantly higher level of feeling positive about their abilities and believing that they could achieve them (i.e., HIF) (M = 3.83, SD = .58) than the level that students actually demonstrated how they set goals and made choices, decision, and plans (i.e., TID) (M = 3.55, SD = .61), $t(641) = 16.08, p < .01, d = .4$. The analysis of the sub-scales of *Opportunity* indicated that students' perceptions of opportunities available for them to engage in self-determined behaviors at home (i.e., WHAH) (M = 4.28, SD = .68) was significantly higher than opportunities available at school (i.e., WHAS) (M = 3.78, SD = .70), $t(641) = 16.59, p < .01, d = .72$. Students had stronger support at home to achieve their goals compared to their perceptions of opportunities offered by school.

The correlation between *Capacity* and *Opportunity* was .52 ($p < .01$). The correlation coefficient result showed positive correlation and strong relationship, showing students who viewed themselves having higher capacity received more opportunities, and vice versa.

Thinking, doing, and adjusting. Three stages of the self-determination process included *Thinking* (i.e., identify and set goals to meet needs), *Doing* (i.e., make choices and take actions to meet goals), and *Adjusting* (i.e., evaluate results and alter plans if necessary). A repeated measures ANOVA revealed that the average perceptions of students' *Thinking* (M = 4.00, SD = .49) was significantly higher than both *Adjusting* (M = 3.83, SD = .56) and *Doing* (M = 3.76,

$SD = .60$), $F(2,1280)=99.792$, $p < 0.001$. Follow-up comparisons indicated that students had significantly higher levels of belief that they could set goals to meet their needs than that they could make an adjustment, $t(640) = 9.91$, $p < .01$; their perceptions of making adjustment was significantly higher than making decision or taking actions, $t(640) = 4.21$, $p < .01$.

The correlation between *Thinking* and *Doing* was .68 ($p < .01$); it between *Doing* and *Adjusting* was .72 ($p < .01$); it between *Thinking* and *Adjusting* was .69 ($p < .01$). Three correlation coefficient results showed positive correlations and strong relationships, indicating that students who viewed themselves as having higher levels of beliefs in one of the three stages (i.e., setting goals, taking actions, and making adjustments) positively influenced their beliefs in one of the other two stages.

Did Students with Different Gender, Ethnicity, and Disability Demonstrate Different Degree of Self-Determination?

Gender. Both female ($M = 3.91$, $SD = .48$) and male students ($M = 3.82$, $SD = .49$) stated they *almost always* to *always* engaged in self-determined behaviors (Table 5). The comparison was found that the perception of self-determination of female students was significantly higher than male students, $t(632)= 2.37$, $p = .018$, $d = .19$.

In sub-scales of *Capacity*, the perceptions of females' and males' self-determination had no significant differences, $t(632)= 1.42$, $p = .16$. However, the perceptions of *Opportunities* available between gender groups had significant differences, $t(632)= 2.68$, $p = .008$. The results indicated that the degree of opportunities available for female students to engage in self-determined behaviors at school ($t(632)= 2.41$, $p = .016$) and at home ($t(632)= 2.04$, $p = .042$) was both significantly higher than opportunities available for male students. From exploring the perceptions of three stages of self-determination, only the level of female students' perceptions on *Doing* was significantly higher than male students' perceptions, $t(632)= 2.91$, $p = .004$; the rating of *Thinking* ($t(632)= 1.90$, $p = .06$) and *Adjusting* ($t(632)= 1.44$, $p = .15$) were not found to differ based on students' gender.

Ethnicity. No significant differences in ratings of overall self-determination across ethnicity categories were found, $F(5, 623) = 1.26$, $p = .28$ (See Table 6). No significant differences among ethnicity groups were also found in in *Thinking* $F(5,623) = 1.30$, $p = .26$; *Doing* $F(5,623) = 1.08$, $p = .37$); and *Adjusting* $F(5,623) = 1.12$, $p = .35$) had no significant differences.

Disability. The overall self-determination rated by three disability groups had significant differences, $F(2, 398) = 6.22$, $p = .002$, $\eta^2 = .03$, with small effect sizes of 3% of the variation. The perceptions of self-determination rated by SLD group ($M = 3.97$, $SD = .49$) was the highest and had significantly higher rating than ADHD group ($M = 3.77$, $SD = .49$) (Table 7). In sub-scales, SLD students' perceptions of *Capacity* was also the highest and significantly higher than ADHD students' perceptions ($p = .001$); three groups' perceptions of *Opportunity* did not have significant difference, $F(2, 398) = 2.89$, $p = .06$. For three stages of the self-determination process, students among disability groups did not have significant differences on *Thinking*, $F(2, 398) = 1.67$, $p = .19$. They had significant differences on *Doing*, $F(2, 398) = 7.20$, $p = .001$, $\eta^2 = .04$ and *Adjusting*, $F(2, 398) = 6.32$, $p = .002$, $\eta^2 = .03$. Although with small effect sizes of 4% and 3% of the variation in *Doing* and *Adjusting*, respectively, SLD groups' rating was both significantly higher than ADHD groups.

Qualitative Results

What were the Goals that Students Planned to Achieve?

Three main themes, *Academic Goals, Health Goals,* and *Employment and Finance Goals*, were identified as the planning goals of students with learning and attention challenges in the SALT Center. In total, 573 codes were identified. Each theme included several categories to describe a specific phenomenon of students' responses. Sub-categories were demonstrated under different categories. The themes, categories, and sub-categories were outlined in Table 8 to enhance readers' understanding of students' goals.

Theme One: Academic Goals

When exploring students' goals, the first category extracted from their responses was academic goals. The theme accounted for 55%, over half of the total coded responses, representing the largest proportion of the content. The categories under the first theme were considered as three stages–before, during, and after college: (a) attending college, (b) success in college, and (c) pursing advanced learning. Percentages of the three categories are displayed in Table 8.

Attending college. Students' responses (33%) in the Academic Goals theme showed their targets of attending college. Graduating from high school smoothly appeared to be the first step for attending college. For example, one student said, "My goal is to continue to push myself and work hard through the end of the year and to not be a victim of 'senior

slide'." Some students stated their expectations to get acceptance to college. Approximately in 80 student responses, the largest proportion among three sub-categories, reflected their foci on transition preparations, including academic, mental, and material. For example, one student stated that he/she was "preparing academically for the next school semester." Some students expressed their worries about attending college, such as "I am packing and getting ready to move into college, but feeling very nervous and anxious about moving away from home." Other students planned to prepare materials that they needed for college, such as "I am preparing for getting all materials that I need to succeed."

Success in college. More than two hundred students' responses (65%) in the Academic Goals theme reflected students were eager to succeed in college. Students expected to succeed at their first year, maintain a good GPA throughout college, and declare their majors. For example, students said they wanted to "start off college with good grades," "maintain good grade," and "find the right major and accomplish it." Some students not only described earning a degree but also setting goals of their GPA and connecting their coursework with getting a job, such as "graduate with a 3.5 at least" and "trying to earn my degree to be able to have a good job." Only 2% of students' responses showed their goals to pursue advance learning after graduating college.

Pursing advanced leaning. Approximately only 2% of students' responses showed their goals to pursue advance learning after graduating college. Two students stated that they planned to apply to graduate school at their targeted universities after college graduation. In addition to attending graduate school, other students said their goals were to enroll in professional programs, such as medical school and veterinarian school. One student even had already determined to study "osteology, anthropology, and medicine at the professional level" five years ago.

Theme Two: Health Goals

Students' responses reflected an importance of health. The coded responses (28%) in the Health Goals theme represented the second highest proportion of the content. The categories under this second theme were (a) physical health, (b) mental health, (c) social relationship, and (d) leisure engagement. Percentages of the four categories were demonstrated in Table 8.

Physical health. Approximately 37% of students' responses in the Health Goals were their physical health. Students especially emphasized two kinds of physical health–eating healthier and doing physical fitness. Students had goals of eating better diets, cutting sugar out of their diet, and developing better eating habits. About physical fitness, students focused on getting in a better shape. For example, students said they wanted to "los[e] weight" (mostly women) or "gain weight" (mostly men).

Mental health. Nearly 20% of students' responses in Health Goals theme showed their expectations to enhance their mental health, including developing self-awareness, becoming independent, and building self-advocacy skills. Some students planned to develop their self-awareness and to know more about their own feelings, motives, and desires. For example, one student stated a goal to "build self-esteem and be positive." Another two students mentioned about working on their awareness of stress and anxiety, stating "trying not to over stress myself" and "working on becoming less anxious." One student wrote, "This isn't necessarily a school-related goal, but I'm working on discovering myself. For example, what makes me happy, what is toxic in my life, how to make myself feel better, and what works best for me." In addition, becoming independent was addressed. Students expressed that they were working on "becoming more independent" and "self-reliant" in their life and/or academic field. One student's response, "A goal that I am working on now is being more of an advocate for my learning disabilities and learning how to speak," provided strong evidence that they intended to build advocacy skills.

Social relationship. Students' responses about social relationships (28%) in the Health Goals theme included spending time with family/friends, joining a team, and making new friends. Students not only expected to keep good relationship with their family and friends but also to expand their social relationships. Some students mentioned they wanted to make new friends, such as "to make new friend and build a community for myself" and "being more outgoing and social." Some students specified the teams that they had desires to join, including a sport team, a fraternity/sorority, and a student club. For example, students said they wanted to "play club baseball in college" and "apply to the Freshmen Class Council."

Leisure engagement. About 15% of students' responses reflected their leisure engagement in the Health Goals theme. This category accounted for the smallest proportion of the content; however, most of students' responses showed their hobbies they pursued during their leisure time were embedded with professional skills and/or knowledge. Three types of leisure engagement were included: artistic pursuit, language-based hobby, and athletic activity. Students who pursued artistic hobbies set goals in working on

artworks, music, and performing art. For example, students said they planned to "get better at different art techniques," "learn guitar," "write the most sophisticated and beautiful music," and "work on YouTube channel."

Theme Three: Employment and Finance Goals

Students' responses under the Employment and Finance Goal theme accounted for 28% of the total responses, which was the smallest proportion of an entire coded content. These responses showed evidence of (a) job and career and (b) finance goals. Percentages of both categories are presented in Table 8.

Job and career. About 65% of coded responses under this theme were described students' job and career goals. Job targets were considered short-term, including students' pursuit in summer job and internship. Some students who were working on short-term, part-time job anticipated to get promotion and work harder to gain more work experiences. Long-term career goals included varied occupations depending on students' potential majors and/or interests. For example, students wanted to become a nutritionist, professional photographers, athletic trainers, architects, businessmen who owned companies, and productive artists.

Finance goals. Approximately 35% of students' responses under the third theme was finance goals. Three dimensions were included: saving money, earning money, and spending money. Students who stated spending money usually targeted a product or recreation activity, such as purchasing a car, wakeboard, trip, and ticket. Students' responses that reflected saving money and earning money usually included not only their actions to save and earn money but also their plans and/or purposes. For example, one student stated, he/she tried to "get a second job to save more money for college," and another student said, "earning enough money from my job to be able to afford gas for my car."

Discussion

Awareness of Different Gender, Ethnicity, Disability Groups in Self-Determination

The impacts of multiple individual factors on self-determination have been examined in several studies (Carter et al., 2010; Mithaug, Campeau, & Wolman, 2003; Nota, Ferrari, Soresi, & Wehmeyer, 2007; Shogren et al., 2007; Wehmeyer & Garner, 2003; Wehmeyer et al., 2013). Knowing the results of these studies may lead to validate and implement interventions for future efforts. Three demographic characteristics, including gender, ethnicity, and disability, may prove to be important when designing academic support for students.

Gender. The findings of examining differences in self-determination by gender are limited and mixed. Wehmeyer and Garner (2003), as well as Mithaug et al. (2003), found no differences on overall self-determination scores by gender for people with disabilities. While receiving special education services, high school students with disabilities had no gender difference in growth of self-determination (Wehmeyer et al., 2013). However, Shogren et al. (2007) and Nota et al. (2007) found that gender significantly affected self-determination with American and Italian participants, finding that females had higher self-determination scores than male. From the teacher's perspective, female students with high-incidence disabilities were found to have higher self-determination scores than male students (Carter et al., 2010). These findings were consistent with our study. Overall, studies demonstrated that male students' self-determination was lower or at similar levels compared to female students'. As a result of our findings, and those outlined in the literature, an area to further explore would be specific efforts on assisting male students in building self-determined behaviors.

Ethnicity. Studies showed that students' different ethnic groups had no significant difference in self-determination (Carter et al., 2010; Mithaug et al., 2003). The results of our study did not indicate that ethnicity had an impact on the students' perceptions of self-determination.

Disability. In Wehmeyer et al.'s (2013) study, disability as a factor did not have significant effects when intervention or control groups were compared. However, in Carter et al.'s (2010) study, researchers investigated teachers' perceptions of self-determination of students with conduct disorder (CD), emotional and behavioral disorder (EBD), and SLD. Teachers reported capacities of students with SLD to have greater levels when compared to students with CD and EBD. Additionally, researchers found there were no significant differences in perceived opportunities among the three student groups. In our study, students with SLD also had the highest perceptions of their self-determination compared to students with comorbidity and those with ADHD. Their perceptions of opportunities did not have significant differences when compared to each other.

In sum, self-determination of diverse groups (i.e., gender, ethnicity, disability) and when analyzed from different perspectives (i.e., students, parents, teachers) may have different results. Some other characteristics, such as age, setting, social-economic status, and environmental characteristics, may also have a potential impact on students' self-determination (Shogren

et al., 2007). In our study, male students with learning and attention challenges had lower levels of perceptions on their overall self-determination compared to female counterparts at the SALT Center. This result may indicate that educators could put more emphasis or effort on male students' self-determination who also commonly account for higher percentage of enrolled students. In addition, students with ADHD are the largest group among enrolled students, however, they also had lower perceptions of overall self-determination. Compared to other disability groups, students with ADHD may need to gain more attention from parents and educators. This may also provide another area of inquiry for researchers, that is to ask why do young men in college, particularly those with ADHD, tend to have lower perceptions of self-determination when compared to their female peers?

Goals of Students with Learning and Attention Challenges

Myth busting. There are several common myths that have existed regarding students who have executive function difficulties. Some of them include that they are lazy or lack ambition (Lansdown, Burnell, & Allen, 2007). They are also seen as careless and unmotivated in school. In this study, the participants showed that they had clear goals that they desired to achieve in academic, health, and employment and finance areas, while also thinking and working on these goals within a short- and long-term timeline. The importance of setting goals and high expectations for transition planning process have also been identified as being an important part of successful student development (Getzel & Thoma, 2008; Wehmeyer, Agran, & Hughes, 2000). The biggest challenge for students with disabilities is that they tend to have lower levels of self-regulation skills than students without disabilities (Mithaug et al., 2003). When entering college, they may highly engage in what they are pursuing, however, they may face real challenges and feel frustrated because of lower self-determination levels or self-regulated behaviors. Thus, supporting and encouraging them with appropriate strategies that fit their needs is imperative to help them pursue and achieve their goals, while enhancing their self-determination and self-efficacy.

Support. Our study showed students thought their home environments provided more opportunities for them to exhibit self-determination thoughts and behaviors than their school environment, which illustrates a potential gap between teachers' and parents' perceptions of their children with learning and attention challenges (Carter et al., 2010).

When providing supports for students, two findings are worth discussing. First, strong correlations were found between *Capacity* and *Opportunity* as well as among *Thinking, Doing*, and *Adjusting*. When supporting students, parents, teachers, student support specialists, and/or tutors could provide scaffolding in one area, knowing that the other two areas would likely be enhanced. For example, if a tutor were to model and teach a student how to initiate (*Doing*) a study strategy on their own during their study time, the student may also gain greater awareness of the broader skill, which is self-regulation. In turn, this enhanced skill of self-regulation may also increase the student's awareness of how to more effectively *Adjust*. Bandura (2000) illustrated a similar phenomenon when observing how success on related tasks showed to positively impact students' self-efficacy.

Second, self-advocacy, defined by Stodden, Conway, & Chang (2003) and others (Anctil et al., 2008; Daly-Cano, Vaccaro, & Newman, 2015; Thoma & Wehmeyer, 2005), support was one of the sub-categories that aligned with the literature and proved to be an important component of self-determination. However, little is known and documented on how college students with disabilities use self-advocacy skills to navigate the university demands and expectations (Daly-Cano et al., 2015). Several participants had goals related to self-advocacy, thus it may be an area that should be better understood as it could inform intervention practices to help guide and equip students.

Limitations and Implications

Limitations and Implications for Research

Several limitations and implications for future research are suggested. First, results may be generalized to universities with a fee-based program and provide suggestions to universities which plan to create a similar program. However, it may not be generalizable to a broader population of college students with learning and attention challenges at the UA or at other universities. Although the goal themes may be common for college students who have learning and attention challenges who fit a similar demographic and/or social-economic status, different findings may emerge based on students' diverse needs from different contexts. For instance, the findings may be very different for ethnic minorities and first-generation college enrollment. Students with limited financial resources with similar learning and attention challenges may not select to enroll in such a program because of the additional fees associated with program participation. Additionally, it is likely that students with very low social-economic status may have goals

that revolve around other priorities such as financing their education, shelter and food security, and other essential needs (Maslow, 1943). Second, a limitation to this study is the sample size, which may limit the representative voice of the students identifying goals, therefore increasing the research population would be recommended. Third, only one of the three qualitative survey prompts was analyzed. Future researchers are suggested to investigate the responses to the two other questions: (1) What have you done to achieve their goals? (2) How have you reacted to obstacles in achieving your goals? Lastly, it is recommended to identify other variables (e.g., self-determination, duration time of attending tutors' sessions, times of attending student support specialists' sessions) as potential predictors of academic success (e.g., learning outcomes, GPA). A prediction model could lead to other non-cognitive factors that could be used to gain greater understanding of the whole student experience, while informing University administrators and specialists on more effective and specific services that target specific needs, foster student growth, and improve academic performance.

Implications for Practice

Although the implications may not be universally applicable, it would still be important for the researchers and learning center directors to share these and related findings with other campus professionals so that greater awareness is provided to those who interact, support, and teach students with learning and attention challenges, but who do not necessarily have particular expertise in this student population. At the very least, this greater understanding could help clarify misunderstandings and demystify some of the common myths about students with SLD and ADHD.

It would also be important for the learning center leadership team to provide training for student support specialists, tutor coordinators, and the student employee team. First, the team could provide knowledge of self-determination, the theory, and its components. Second, the team could facilitate professional development sessions on how to model establishing (*Thinking*), pursuing (*Doing*), and overcoming obstacles (*Adjusting*) when students complete their goals. Examples of such may include backwards planning, visualization techniques, use of technology prompts, and distinction between long- and short-term goals.

For student support specialists and tutor trainers, the study results can facilitate their discussions with students who have learning and attention challenges. Aligned with the training content, recommended content of discussions is suggested to include (a) perceptions about the support that students currently have and the support that students will need to be successful when pursuing their goals; (b) perceptions about students' responsibility to think, do, and adjust when they set and purse their goals; and (c) students' goals related to majors and minors, as well as specific goals of the courses and assignments enrolled in each term. Thus, learning specialists and tutor trainers can explore and address students' differentiated needs to further implement promising intervention strategies and support students to achieve their goals.

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Acknowledgement

Table 1

Gender, Disability, and Ethnic Groups

Groups	Number (*n*)	Percentage (%)
Gender		
Male	374	58.3
Female	260	40.6
None disclosure	7	1.1
Disability		
SLD	113	17.6
Comorbidity	103	16.1
ADHD	185	28.9
Others	18	2.8
None disclosure	222	34.6
Ethnicity		
African American	15	2.3
Asian/Pacific Islander	29	4.5
Native American	9	1.4
Hispanic	58	9.0
White	500	78.0
Two or more ethnicities	18	2.8
None disclosure	12	2.0
Total Number of Participants	641	100.0

Table 2

Two Domains of the AIR Scale

Domains	Definitions	Sub-Scales	Content
Capacity	Explore knowledge, abilities, and perceptions that enable to be self-determined and feel good about it.	Things I Do (TID)	Measures perceptions of ability
		How I Feel (HIF)	Measures perceptions of self-awareness
Opportunity	Assess chances to use knowledge and abilities at school and at home	What Happened at School (WHAS)	Measures perceptions of opportunities offered at school
		What Happened at Home (WHAH)	Measures perceptions of opportunities offered at home

Table 3

Means and Standard Deviations of Overall and Sub-Scale Scores

	Total	Two Domains		Three Stages		
		Capacity M (SD)	Opportunity M (SD)	Thinking M (SD)	Doing M (SD)	Adjusting M (SD)
Overall	3.86 (.49)	3.69 (.55)	4.03 (.57)*	4.00 (.49)*	3.76 (.60)	3.83 (.56)

*Note. *p<.01*

Table 4

Percentage of Participants in Three Levels

Levels	Total	Two Domains		Three Stages		
		Capacity	Opportunity	Thinking	Doing	Adjusting
Never-Almost Never	4.7%	9.2%	4.2%	2.7%	9.0%	6.2%
Sometimes	52.2%	61.3%	37.9%	40.4%	52.9%	49.5%
Almost Always-Always	43.1%	29.5%	57.9%	56.9%	38.1%	44.3%

Table 5

Gender Differences

Gender	Total	Two Domains		Three Stages		
		Capacity M (SD)	Opportunity M (SD)	Thinking M (SD)	Doing M (SD)	Adjusting M (SD)
Female	3.91 (.48)*	4.10 (.54)	3.57 (.63)*	4.04 (.47)	3.84 (.60)*	3.87 (.55)
Male	3.82 (.49)	3.98 (.59)	3.54 (.59)	3.96 (.50)	3.70 (.60)	3.80 (.57)

*Note. *p<.01*

Table 6

Ethnicity Differences

Ethnicity	Total M (SD)	Two Domains		Three Stages		
		Capacity M (SD)	Opportunity M (SD)	Thinking M (SD)	Doing M (SD)	Adjusting M (SD)
African	4.04 (.50)	4.13 (.54)	3.83 (.56)	4.12 (.55)	4.00 (.57)	4.02 (.50)
Asian	3.75 (.50)	3.81 (.65)	3.47 (.66)	3.82 (.59)	3.72 (.58)	3.73 (.52)
Native	3.69 (.22)	3.69 (.65)	3.52 (.63)	3.88 (.35)	3.57 (.50)	3.61 (.44)
Hispanic	3.91 (.52)	4.12 (.59)	3.55 (.67)	4.06 (.49)	3.82 (.62)	3.86 (.62)
White	3.85 (.49)	4.03 (.57)	3.54 (.59)	4.00 (.48)	3.74 (.60)	3.83 (.56)
More	3.98 (.39)	4.11 (.38)	3.72 (.67)	4.01 (.34)	3.91 (.59)	3.99 (.48)

*Note. *$p<.01$

Table 7

Disability Differences

Disability	Total M (SD)	Two Domains		Three Stages		
		Capacity M (SD)	Opportunity M (SD)	Thinking M (SD)	Doing M (SD)	Adjusting M (SD)
SLD	3.97 (.49) *	4.12 (.57)*	3.69 (.64)	4.05 (.50)	3.92 (.62)*	3.96 (.54)*
Comorbidity	3.85 (.48)	4.00 (.55)	3.43 (.61)	3.98 (.48)	3.73 (.61)	3.83 (.57)
ADHD	3.77 (.49)	3.95 (.57)	3.54 (.61)	3.94 (.47)	3.64 (.60)	3.73 (.56)

*Note. *$p<.01$

Table 8

Themes, Categories, and Sub-Categories

Themes	Categories	Sub-Categories
Academic Goals (55%)	Attending College (33%)	Graduating from High School Acceptance to College Transition from High School to College
	Success in College (65%)	Successful First Year Maintaining a Good GPA Declaring a Major Improving Academic and Study Skills Graduating from College
	Pursuing Advanced Learning (2%)	Applying to Graduate School Enrolling in a Professional Program
Health Goals (28%)	Physical Health (37%)	Eating Healthier Doing Physical Fitness
	Mental Health (20%)	Developing Self-Awareness Becoming Independent Building Self-Advocacy Skills
	Social Relationship (28%)	Spending Time with Family/Friends Joining a Team Making New Friends
	Leisure Engagement (15%)	Artistic Pursuit Language-Based Hobby Athletic Activity
Employment and Finance Goals (17%)	Job and Career (65%)	Short-term Job Targets Long-term Career Goals
	Finance Goals (35%)	Saving Money Earning Money Spending Money

First- Year College Students with ADHD:
Risk for and Correlates of Alcohol and Substance Use

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Abstract

College students with attention-deficit/hyperactivity disorder (ADHD) are at higher than average risk for alcohol and substance use; however, it is unclear whether having ADHD, either alone or in combination with other factors, increases this risk. Further, no prior studies have systematically examined factors that correlate with alcohol and substance use among college students with ADHD. A sample of first year college students with (n = 228; 52.2% female; 76.8% Caucasian) and without (n = 228; 51.3% female; 51.3% Caucasian) ADHD from 10 eastern US universities participated in a longitudinal study examining the long-term outcomes of college students with ADHD. Participants completed a battery of measures including self-report ratings of alcohol and substance use; ADHD, externalizing disorder, anxiety disorder, and depression symptoms; executive functioning; and learning and study strategies. First-year college students with ADHD were significantly more likely to use tobacco, cannabis, and illicit drugs (Cohen's d range = 0.30 to 0.33), but not alcohol (Cohen's d = 0.18). Separate multiple regression models indicated that each of the four substance use outcomes was best explained by a unique combination of predictive factors with anxiety symptoms and executive functioning deficits correlated with increased use of at least two of the substances. Additional longitudinal research is necessary to identify variables associated with ongoing substance use in college students with ADHD so as to inform screening, prevention, and intervention efforts.

Keywords: attention-deficit/hyperactivity disorder, college students, alcohol use, drug use, tobacco use

It is currently estimated that between 2% and 8% of college students have ADHD, and an increasing number of young adults with ADHD continue to pursue postsecondary education opportunities (DuPaul, Weyandt, O'Dell, & Varejao, 2009; Green & Rabiner, 2012; Murphy & Barkley, 1996). With limited availability of diagnostic assessment and treatment services (DuPaul & Weyandt, 2009), college students with ADHD are at significantly elevated risk for a host of adverse outcomes (e.g., school dropout, depression). One risk that represents a major public health concern is a pattern of substance use and abuse, which among students with ADHD has been documented to begin as early as adolescence (Molina, et al., 2013; Sibley, et al., 2014). Recent research has identified a bidirectional relationship between substance use disorders and ADHD among both adolescents and adults (Wilens & Kaminski, 2018). Additionally, a meta-analysis of longitudinal studies following children with ADHD into adolescence and adulthood indicated that children with ADHD were at significantly higher risk of developing substance abuse disorders, and that this finding was consistent across studies (Lee, Humphreys, Flory, Liu, & Glass, 2011). Among the general college population, students without ADHD are overall more likely to engage in risky substance use behaviors including illicit drug use, binge drinking, and misuse of prescription medications (Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015). There is an even greater prevalence of substance use among

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individuals with ADHD compared to typical peers, particularly in young adulthood (Miranda, Colomer, Berenguer, Roselló, & Roselló, 2016). It is important to examine risk factors and predictors of substance use among college students because heavy drinking and substance use may interfere with academic success, including decreased likelihood of graduating (Arria et al., 2013; Martinez, Sher, & Wood, 2009), and most college counseling and health centers are ill-equipped to adequately address these risks (Perron et al., 2011).

Consistent with findings for the adult ADHD population, college students with ADHD report greater substance use than their typical peers (Green & Rabiner, 2012). Alternatively, the research is mixed regarding alcohol use. Some studies have documented more frequent drinking and greater alcohol consumption among college students with ADHD (Blase et al., 2009), but other studies have found no differences in alcohol use between college students with ADHD and their peers (Molina et al., 2007; Rabiner, Anastopoulos, Costello, Hoyle, & Swartzwelder, 2008). However, research suggests that college students with ADHD are more likely to report experiencing negative consequences of problems related to their alcohol use. For example, Baker, Prevatt, and Proctor (2012) found that college students with ADHD were significantly more likely than typical peers to feel they could not control their drinking, and they were more likely to experience serious adverse effects associated with binge drinking (e.g., blacking out, going to the hospital); they are also more likely to endorse items indicative of alcohol dependence (Rooney, Chronis-Tuscano, & Yoon 2012).

For tobacco use, college students with ADHD have been found to be between 2.5 and 3.5 times more likely to have smoked cigarettes than their non-ADHD peers (Rabiner et al., 2008), which is consistent with additional research finding higher rates of smoking (Lambert & Hartsough, 1998; Pingault et al., 2013) and higher likelihood of beginning to use tobacco products (Blase et al., 2009). Prior studies have identified that college students with ADHD are at heightened risk of using cannabis and illicit drugs. Specifically, it has been estimated that this population of students is more than 2.5 times as likely to have used cannabis and more than 6 times as likely to have used other drugs in the past year (Green & Rabiner, 2012; Upadhyaya et al., 2005). Another study suggested that students with ADHD were three times as likely as their typical peers to have used cannabis and tobacco products and four times more likely to have used illicit drugs (Rooney et al., 2012).

It remains unclear whether having ADHD, either alone or in combination with other factors, increases the risk of alcohol and substance use. Prior research in the general population has sought to identify other variables beyond ADHD status that may predict risk for substance abuse problems.

Primary ADHD Symptoms

There are numerous factors that may contribute to the relationship between ADHD and substance use. Preliminary research has found more severe ADHD symptoms to be predictive of drug-related behaviors (Barkley, Fischer, Smallish, & Fletcher, 2004; Molina & Pelham, 2003). Upadhyaa and Carpenter (2008) found that frequency of tobacco, cannabis, and alcohol use in the past month increased proportionally along with the number of ADHD symptoms an individual endorses. In particular, inattention symptoms have been tied to substance use outcomes (Miranda et al., 2016; Molina & Pelham, 2003). Current inattention symptoms in college students with ADHD have been linked to higher levels of cannabis use and problems (Bidwell, Henry, Willcutt, Kinnear, & Ito, 2014), as well as tobacco use (Glass & Flory, 2012). Although inattention symptoms have not been found to be predictive of alcohol use in college students with ADHD, there is an association between inattention and problems relating to alcohol use (Glass & Flory, 2012; Mesman, 2015). Additionally, childhood history of hyperactivity-impulsivity predicts earlier onset of use of alcohol, cannabis, and tobacco (Bidwell et al., 2014; Chang, Lichtenstein, & Larsson, 2012). Beyond core ADHD symptoms, another common feature of ADHD – impaired executive functioning – has been linked to higher levels of substance use, earlier onset of use, and greater substance-related problems (Munro, Weyandt, Marraccini, & Oster, 2017; Nigg et al., 2006). The relationship between executive functioning and risk for substance abuse is generally thought to be bidirectional, such that college students who engage in binge drinking behaviors have been shown to perform worse on tasks of executive control (Parada et al., 2011).

Comorbid Conditions and Symptoms

It may be important to consider the comorbid conditions that frequently co-occur with ADHD and have the potential to impact substance use outcomes and related functional impairment (Biederman et al., 1996). High rates of comorbidity have been identified between substance use and mental health problems, particularly among young adults ages 18-25 (Chan, Dennis, & Funk, 2008). A substantial body of research has identified a strong link between conduct disorder and externalizing symptoms and substance use in young adults and adolescents with

ADHD (Miranda et al., 2016; Molina & Pelham, 2003; Molina et al., 2012). However, Rooney et al., (2012) examined alcohol and illicit drug use among college students with and without ADHD and found that, even when controlling for Conduct Disorder (CD) symptoms, students with ADHD still obtained significantly higher scores for self-reported alcohol use. Substance abuse risk is also higher among adults with internalizing disorders (Grant et al., 2004). One study found that college students with poor mental health or depression were more likely to report drinking, engaging in frequent and heavy drinking, and experiencing alcohol-related problems (Weitzman, 2004), although the relationship between depression and alcohol use appears to be bi-directional (Pedrelli, Shapero, Archibald, & Dale, 2016). Anxiety, in particular, is thought to contribute to alcohol use as a result of individuals using alcohol to reduce their perceived anxiety symptoms in the short-term, which in the long-term may actually increase anxiety (Kushner, Abrams, & Borchardt, 2000).

Demographic Characteristics

Numerous demographic variables have been found to predict substance use outcomes among college students, including college students with ADHD. Several studies have concluded that males are at higher risk of engaging in substance use and abuse than females (Chen & Jacobson, 2012; McCabe et al., 2007). In a review of the literature, Borsari, Murphy, and Barnett (2007) observed that men tend to engage in greater alcohol use than women, but both genders experience similar levels of alcohol-related problems. Race and ethnic differences have also been observed, such that Caucasian college students, particularly Caucasian males with ADHD, have been identified as an especially high-risk population for substance use and abuse (Baker et al., 2012; Borsari et al., 2007; McCabe et al., 2007). In contrast, several studies have established that young African American adults tend to be at lower risk for substance abuse and dependence (e.g., Malone, Northrup, Masyn, Lamis, & Lamont, 2011; Turner & Gill, 2002). Hispanic youth are thought to occupy an intermediate level of risk such that they report less substance use than Caucasian students, but have relatively higher risk of substance use compared to other racial/ethnic minorities (Malone et al., 2011). The relationship between socioeconomic status and substance abuse is more nuanced. One review of the literature found that extreme poverty, in combination with childhood behavior problems, was predictive of worse long-term substance abuse outcomes; however, some studies have linked higher parental education and occupational prestige to increased use of alcohol and cannabis, at least among adolescents in the general population (Hawkins, Catalono, & Miller, 1992). At present, it is unknown whether socioeconomic status is related to substance abuse risk among college students with ADHD.

Other Predictors of Substance Abuse

To date, it is unknown whether ADHD-related functional impairment in academic or social domains directly predicts substance abuse risk. Previous studies have linked substance use to reduced academic functioning (e.g., lower educational attainment, poor achievement, lower GPAs) among college students and young adults (Macleod et al., 2004; Singleton & Wolfson, 2009). As a result, it may be the case that poor academic functioning could be predictive of substance abuse risk. In addition, social impairment in high school students with ADHD has been found to be associated with alcohol use through the impact on delinquency (Molina et al., 2012).

More recent research has further focused on examining whether psychopharmacological treatment of ADHD impacts future substance use behaviors. Several studies have observed that treating ADHD with medication does not increase risk of later substance use behaviors (Humphreys, Eng, & Lee, 2013; Molina et al., 2013; Molina & Pelham, 2014). However, evidence has been mixed regarding whether treating ADHD with medication directly protects against developing later substance use disorders, with some studies finding that it does (Uchida, Spencer, Faraone, & Biederman, 2015) and others that it does not (Molina, et al., 2013). Interestingly, Muld, Jokinen, Bölte, and Hirvikoski (2015) found that individuals with ADHD and substance abuse problems who were treated with medication were less likely to relapse and were more likely to voluntarily seek treatment for substance abuse. It remains unknown whether receiving other types of services, including psychosocial treatment, may moderate the association between ADHD and substance use and abuse. Given the evidence base for psychotropic medication and psychosocial interventions to reduce ADHD symptoms (e.g., MTA Cooperative Group, 1999a, 1999b), it is possible that accessing these types of services will influence later substance use patterns by limiting the impact of the number of symptoms or symptom severity.

Objectives of the Proposed Study

Given the significant prevalence of ADHD in the college student population (e.g., DuPaul et al., 2009), there is a growing need for research regarding substance abuse outcomes among this at-risk population. In addition to ADHD status, there is evidence to sug-

gest that primary ADHD symptoms (e.g., Barkley et al., 2004; Miranda et al., 2016), co-morbid externalizing conditions (e.g., Molina et al., 2012) and being male or Caucasian (e.g., Baker et al., 2012), may heighten the risk of substance abuse among college students with ADHD. Among the general college population, internalizing disorders and poor academic functioning have also been linked to greater substance use (Singleton & Wolfson, 2009). At present, it is unknown whether treatment participation may be associated with substance abuse risk, or lack thereof, among college students with ADHD. It will be important to gain a better understanding of how these variables influence the risk of substance abuse among students with ADHD. The transition to college marks a particularly key period for intervention because many first-year college students develop a pattern of risky substance use that puts them on a trajectory towards negative outcomes throughout the college years and beyond (Borsari et al., 2007).

The purpose of this study was two-fold. The first aim was to examine whether first-year college students with ADHD differ from their peers without ADHD in their self-reported risk of substance abuse related to alcohol, cannabis, tobacco, and other illicit drugs. It was hypothesized that college students with ADHD would display significantly higher risk of abuse of all four substances compared to their typical peers. The second aim was to examine whether demographic characteristics, severity and type of ADHD symptoms, executive functioning deficits, comorbid symptoms, functional impairment, and receipt of treatment services were predictive of substance use behaviors and associated problems. It was hypothesized that Caucasian males with severe inattention symptoms would demonstrate the highest levels of risk for abuse of all four substances. The presence of comorbid mental health conditions and problems, including both internalizing and externalizing symptoms, were expected to predict substance abuse risk. Although prior research has not addressed the effects of academic/social impairment and treatment participation on substance use outcomes among the college ADHD population or has led to inconclusive results, it was hypothesized that greater impairment would be predictive of increased risk of substance abuse given previous research indicating that greater impairment leads to poorer outcomes overall. Additionally, it was hypothesized that participating in treatment for ADHD symptoms would be predictive of decreased risk for substance abuse given the evidence base for psychotropic medication and psychosocial interventions to reduce ADHD symptoms in childhood (e.g., MTA Cooperative Group, 1999a, 1999b), which may in turn effect substance abuse behaviors.

Method

Participants and Setting

Participants were part of the Trajectories Related to ADHD in College (TRAC) Project, a longitudinal study comparing two cohorts of college students with and without ADHD (for details regarding participants and procedures, see Anastopoulos et al., 2018). Participants were recruited during their first year of college across nine different universities in the Eastern United States and needed to meet criteria for ADHD in either all or no measures for inclusion in the ADHD or comparison groups. Students who did not meet criteria for ADHD on all measures were excluded from the study.

In the current study, participants were students in their first year of four-year college from across multiple universities within three states on the east coast. The total sample of participants (N=456, 52.2% female), which included an equal number of students (n = 228) with and without ADHD, was used to address the study's first aim related to group differences. The two groups did not differ significantly with respect to gender, age, and ethnicity (see Table 1). To address the study's second aim examining predictors of substance use, only participants from the ADHD group who had completed all stages of first year data collection (N=207) were included in the analyses.

Procedures

All procedures were reviewed and approved by the Institutional Review Boards at each campus site. Students were screened for participation using a semi-structured clinical interview. Self- and parent-report of current and childhood ADHD symptoms were used to determine whether students would be included in the study using the ADHD Rating Scales (parent version, childhood version, past six months; DuPaul, Power, Anastopolous, & Reid, 1998). Students were included in the ADHD group if they met DSM-5 criteria for ADHD on all measures; if they did not meet criteria for ADHD on any measure, they were included in the Comparison group. Students then met with graduate research assistants to complete subsequent measures. For participant assessment procedures and detailed screening measures, see Anastopolous et al. (2016).

Dependent Measures

World Health Organization – Alcohol Smoking and Substance Involvement Screening Test V3.0 (WHO ASSIST; WHO ASSIST Working Group, 2002). Substance use (tobacco, alcohol, and illicit drug use) was operationalized using the, WHO AS-

SIST, a validated screening instrument for determining an individual's substance use patterns (Humeniuk et al., 2008). The WHO ASSIST is an eight-question interview that covers 10 substances: tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, opioid, and "other drugs." The questions assess lifetime and current use of substances, and individuals respond using Likert scale options assessing quantity and frequency of use, as well as degree to which use is problematic. The WHO ASSIST has sensitivity ranging from 54-94% and specificity ranging from 50-96%. The assessment also has a good to excellent test-retest reliability ranging from 0.58 to 0.90 depending on the item, and it has construct validity ranging from 0.77 to 0.94 (WHO ASSIST Working Group, 2002).

Use of tobacco, alcohol, and cannabis were analyzed separately. Due to the low incidence of use of the other substances in this sample, all the other substances were analyzed as one "other" category. The raw scores for each substance are combined to give one final total score per substance at the end of the measure. For the purpose of this study, total scores for tobacco, alcohol, cannabis, and a combined score for all other drugs were calculated and included in the analyses.

CAARS-Self Report. ADHD symptom severity was measured using the Conners' Adult ADHD Rating Scale – Self-Report Long Form (CAARS – S:L), a self-report scale that has demonstrated reliability and validity as a measure of the presence and severity of ADHD symptoms (Conners, Erhardt, & Sparrow, 1999; Erhardt, Epstein, Conners, Parker, & Sitarenios, 1999). The CAARS – S:L is a 66-item self-report questionnaire in which respondents rate items pertaining to their behavior experiences using a four-point Likert scale for each item. The responses range from 0 (*not at all, never*) to 3 (*very much, very frequently*). The CAARS – S:L has a diagnostic sensitivity of 82%, specificity of 87%, and an overall diagnostic efficiency rate of 85%. For the purpose of this study, self-reported symptoms from all three domains of the measure (inattention/memory problems, hyperactivity/restlessness, and impulsivity/emotional lability) were included in data analyses.

Behavior Rating Inventory of Executive Function- Adult Version (BRIEF-A). The BRIEF-A (Roth, Isquith, & Gioia, 2005) is a standardized self-report measure that measures adults' views of their self-regulation and executive in their everyday environment over the past month in which they complete the measure. Appropriate internal consistency, test-retest reliability, convergent and discriminant validity have been demonstrated as well. The measure is comprised of 75 self-report items over nine

scales that measure different aspects of executive functioning. The scales are Inhibit, Shift, Emotional Control, Self-Monitor, Initiate, Working Memory, Plan/Organize, Task Monitor, and Organization of Materials. Scores from each of these scales are combined to yield a Global Executive Composite (GEC), which represents the individual's overall executive functioning skills; elevated scores indicate increased executive functioning deficits. In the current study, GEC was used in the analyses.

Beck Depression Inventory- Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II measures depression symptom severity among adults, where adults report symptom severity over the past two weeks. The scale includes 21 items, and it has been shown to include high levels of reliability and validity in adults as well as in college students (Sprinkle et al., 2002). In the current study, total score on this measure was used in the analyses.

Beck Anxiety Inventory (BAI; Beck & Steer, 1993). The BAI measures severity of anxiety symptoms, where participants self-report symptom severity over the past week. The scale includes 21 items related to anxiety. The BAI has been shown to have moderate reliability and validity in measuring anxiety symptoms and severity. In the current study, total score on this measure was used in the analyses.

Externalizing Behavior Rating Scale (EBRS). The EBRS was developed for this project to measure self-reported symptoms and severity of externalizing disorders like Oppositional-Defiant Disorder (ODD) and Conduct Disorder (CD). Participants were instructed to complete items to best describe their behavior over the past six months. The 20-item scale rated on a four-point scale (0 = *not at all*, 3 = *very much*) includes eight items based on the DSM-IV-TR criteria for ODD (e.g., "losing your temper," "arguing with others") and 12 developmentally appropriate items based on criteria for CD (e.g., "starting physical fights," "deliberate fire setting"; American Psychiatric Association, 2013). Total scores measure symptom count and severity of ODD and CD, with higher scores indicating higher symptom severity. Severity scores for both ODD and CD were used for analyses in the current study. The EBRS has demonstrated adequate internal consistency for all items (α=.85) as well as for ODD (α=.85) and CD (α=.66) subscales (Anastopoulos et al., 2016). Significant correlations between the subscales and the CAARS ADHD Index also support the validity of this measure.

Learning and Study Strategy Inventory-Second Edition (LASSI). The LASSI measures student's self-reported awareness and use of various study skills (Weinstein & Palmer, 2002). Subscales

are measured within the 80-item self-report measure including Anxiety (α=.87), Attitude (α= .77), Concentration (α=.86), Information Processing (α=.84), Motivation (α=.84), Selecting Main Ideas (α=.89), Self-Testing (α=.84), Study Aids (α=.73), Test Strategies (α=.80), and Time Management (α=.85) (Weinstein & Palmer, 2002). Items are reported on a 5-item Likert scale (a= *not at all typical of me*, e= *very much typical of me*). Adequate internal consistency and reliability have been demonstrated for this measure (Cano, 2006; Weinstein & Palmer, 2002). The preliminary test-retest reliability correlation was reported as 0.88 (Weinstein & Palmer, 2002). For the present study, the motivation and concentration subscales were included in the analyses because conceptually these are the most likely subscales to contribute to or be affected by alcohol and substance use.

ADHD Impact Module for Adults. The ADHD Impact Module for Adults (AIM-A; Landgraf, 2007) is a self-report measure designed to evaluate six domains related to the quality of life for adults with ADHD. Aside from the Living with ADHD subscale (α = .68), all domains on the AIM-A demonstrated adequate levels of internal consistency (α = 0.83 to 0.91). The entire measure has also demonstrated adequate discriminant validity. For the purposes of the current study, the Relationships/Communication and Performance and Daily Functioning subscales were used as possible predictors given their conceptual relationship with alcohol and substance use.

Services for College Students Interview. Information on history of receiving psychological treatment was collected from the Services for College Students Interview (SCSI), a modified version of the validated Services for Children and Adolescents – Parent Interview (SCAPI) (Jensen et al., 2004). Although the SCSI has not been validated as yet, the SCAPI has been found to be a reliable instrument with a test-retest reliability of 0.97 overall (Hoagwood et al., 2004). The SCSI is a 12-item semi-structured interview that asks about assistance that the individual received anytime in their first year of college. For the purpose of this study, only responses related to use of individual and group counseling (Question 12) and medication use (Question 7) were included in the analyses. Question 7 asked if students had taken medication for ADHD-related difficulties since the start of the fall semester. Question 12 asked if students had participated in or received group or individual counseling/therapy at any time since classes began in the fall. Responses on these two questions were either "yes" or "no," and these binary data were included in the current study.

Data Analysis

To address the first aim, a multivariate analysis of variance (MANOVA) was conducted to determine whether there was a difference between the ADHD and Comparison groups regarding substance use using total scores for the four substances on the WHO ASSIST and for which substances the differences occur. Additionally, Cohen's d effect sizes were calculated to determine the magnitude of obtained differences between groups.

To address the study's second aim, a separate hierarchical regression analysis was conducted for each substance use outcome, with the base model including demographic characteristics that have been typically associated with alcohol and drug use in previous research (e.g., gender, race/ethnicity, parental education level). Subsequent models included correlates related to primary ADHD symptoms and executive functioning; comorbid conduct, anxiety, and depressive disorder symptoms; impairment in social, daily, and study skills functioning; and treatment service utilization (i.e., medication and psychosocial treatment for ADHD symptoms). Stepwise regression procedures were used within each model to identify statistically significant predictors.

Results

Substance Use Patterns in ADHD and Comparison Groups

An initial analysis was conducted to examine the first aim as to whether first-year college students with ADHD were more likely to engage in substance use relative to the Comparison group. An initial multivariate analysis of variance (MANOVA) examined group differences between the ADHD and Comparison groups in their patterns of substance use. Prior to completing the data analyses, multivariate data normality was assessed. Skewness and kurtosis were analyzed, and initially the total scores for tobacco, other drugs, and externalizing behavior scales did not meet criteria for data normality based on Curran, West, and Finch's (1996) recommendations for skewness values to fall between -2 and 2 and kurtosis values to fall between -7 and 7. The data for these variables were transformed utilizing a square root transformation due to the high number of scores of 0. Following the transformation, all variables met criteria for data normality with the exception of the "other drugs" variable and the conduct disorder severity variable, which fell slightly outside the range for normal data. The skewness and kurtosis values as well as means and standard deviations are presented in Table 2.

There was a statistically significant group effect, Wilks' Λ = .963, F (4, 416) = 4.019, p = .003, and the group factor accounted for 3.7% of variance in substance use, which was a small effect. Separate univariate analyses of variance (see Table 3) determined that there were no statistically significant group differences in alcohol use (F (1,419) = 9.96, p = .062; Cohen's d = 0.18). Alternatively, participants in the ADHD group were significantly more likely to engage in tobacco use (F (1,419) = 9.96, p = .002; Cohen's d = 0.30), cannabis use (F (1,419) = 11.51, p = .001; Cohen's d = 0.30), and illicit drug use (F (1,419) = 12.19, p = .001; Cohen's d = 0.33).

Predicting Substance Use in College Students with ADHD

Only the initial regression model, which included demographic variables, accounted for 7.0% of the variance in risk of alcohol use; F (1, 112) = 9.52, p = .003. Contrary to hypotheses, ADHD symptoms, comorbid symptoms, impairment, and treatment participation did not significantly increase the amount of variance explained regarding risk of alcohol use (see Table 4). Standardized regression weights indicate that male gender was a significant predictor of higher levels of risk of alcohol use.

The results of a hierarchical regression analysis indicated that demographic variables, executive functioning deficits and primary ADHD symptoms as well as comorbid symptoms (i.e., model 3), accounted for 12.4% of the variance in risk of tobacco use (F [3, 110] = 6.32, p = .001). Consistent with study hypotheses, male gender, greater executive functioning deficits, and higher anxiety symptom self-ratings predicted greater frequency of tobacco use (see Table 5). Contrary to hypotheses, the final two models (i.e., self-reported functioning and ADHD treatment receipt) did not significantly increase the amount of variance explained for tobacco use.

The regression model that included ADHD symptoms executive functioning deficits accounted for significant variance (4.9%) in cannabis use (F [1, 112] = 6.79, p = .01). Specifically, higher BRIEF global executive composite score indicating greater executive functioning deficits predicted higher cannabis use after controlling for demographic variables and ADHD symptoms (see Table 6).

For other drugs, the regression model that included demographic variables, executive functioning deficits and primary ADHD symptoms, comorbid symptoms, and impairment accounted for 15.9% of the variance (F [3, 110] = 8.13, p < .001) in risk for abuse. For the final model, higher comorbid anxiety disorder symptoms and lower levels of motivation predicted higher levels of other drug abuse after accounting for demographic variables, ADHD symptoms, executive functioning deficits, and comorbid symptoms of CD and depression (see Table 7)

Discussion

As hypothesized, first-year college students with ADHD reported statistically significant greater use of tobacco, cannabis, and other substances (e.g., cocaine, inhalants, sedatives, hallucinogens), relative to their non-ADHD comparison peers. This result is generally consistent with previously reported findings regarding these substances (Blase et al., 2009; Pingault et al., 2013; Rabiner et al., 2008; Rooney et al., 2012; Upadhyaya et al., 2005). Contrary to study expectations, the two groups did not differ with respect to their frequency of consuming alcohol. The current findings therefore add to an increasing body of literature suggesting that college students with ADHD may not differ from their non-ADHD peers in terms of their self-reported frequency of alcohol use (Molina et al., 2007; Rabiner et al., 2008).

For the group differences that were detected, it is important to bear in mind that ADHD diagnostic status only accounted for 3.7% of variance in substance use differences between the two groups. Thus, many factors (e.g., peer relationships and influences, social expectations in college environment) other than ADHD itself need to be identified to create a more complete picture of why it is that college students with ADHD report higher rates of substance use than do their non-ADHD college peers.

Emerging from the hierarchical regression analyses are findings indicating that each of the four substance use outcomes under consideration is best explained by a unique combination of predictive factors. For example, being male and having high levels of anxiety and executive functioning deficits accounted for 12.4% of the variance in tobacco use among students with ADHD. Cannabis use within this same group was predicted by only one factor - namely, high levels of executive functioning deficits - accounting for 4.9% of the variance. High levels of anxiety and executive functioning deficits, along with low levels of academic motivation, emerged as significant predictors accounting for 15.9% of the variance in other substance use (e.g., cocaine, inhalants, sedatives, hallucinogens). Male gender alone predicted a total of 7.0% of the variance in alcohol use.

The obtained findings are consistent with previously reported results addressing the contributions of gender (Bosari et al., 2007), executive functioning (Nigg et al. 2006), and anxiety (Kushner et al., 200)

to substance use within an ADHD population. In contrast with prior research (Bidwell et al., 2014; Glass & Flory, 2012), severity of ADHD symptoms failed to emerge as a significant predictor for any substance use outcome. More than likely, this discrepancy is a function of the restricted range of ADHD symptom severity within the ADHD-only sample. For reasons that are not entirely clear, co-occurring depression symptoms, externalizing behaviors, and receipt of treatment services did not enhance prediction of any substance use outcome, contrary to what has been reported in other studies (Molina et al., 2012; Pedrelli et al., 2016; Uchida et al., 2015).

Taken together, results from this study replicate and extend findings from prior research addressing substance use within an ADHD college population. In contrast with the college samples used in previous investigations, the current study found higher rates of substance use in a sample that was limited to first-year college students with and without ADHD. That such differences would appear during the first year of college has important clinical and research implications. Although it would need to be substantiated by longitudinal research, the fact that first-year college students with ADHD display higher rates of substance use may place them at increased risk for negative outcomes throughout the college years and beyond (Borsari et al., 2007). Also requiring clarification is whether these patterns of atypical substance use began prior to or following initial enrollment in college. In either case, development of both prevention and intervention programs targeting substance use issues within an at-risk ADHD population would seem to be in order.

Limitations

Although promising, it is important to consider the current findings in the context of study limitations. For example, the correlational nature of the design precludes drawing inferences about what may actually cause substance use within an ADHD college population. Also limiting the findings is that the primary outcome measure, the ASSIST, relies on self-report rather than objective assessment of substance use, thereby potentially introducing possible reporter biases into analyses. Not having information about the participants' use of substances prior to enrolling in college (i.e., pre-college baseline data) eliminates any possibility of determining the timing of when substance use patterns began. Although this is the largest study of alcohol and substance use among college students with ADHD to date, data were collected at three sites in the eastern US thus potentially limiting generality of findings to colleges

from other regions of the US. Also there was limited information pertaining to use of disability services and other treatment among the study sample, particularly services and treatment addressing ADHD, such as executive functioning coaching, counseling, and prescription medication use. Although data on use of these services and treatments were collected, the data were quantitative (i.e., no qualitative data were collected), and numbers relating to utilization were too small to meaningfully analyze. Future research should include a primary focus on college disability service use and pharmacotherapy and how well these interventions impact substance use among college students with ADHD. Finally, this study focused on first year college students, thus longitudinal studies are necessary to document changes in alcohol and substance use across the college years as well as to examine whether ADHD vs. non-ADHD group differences are evident beyond the first year.

Clinical Implications

Despite these limitations, the results of this study have several important implications for clinicians and higher education support personnel working with college students. First, it is clear that students with ADHD, particularly males, may be at higher risk for use of substances (i.e., tobacco, cannabis, and illicit drugs) that may negatively impact physical and mental health functioning. Thus, ongoing surveillance of substance use should be conducted routinely in the context of physical examinations, counseling sessions, and academic support for students with ADHD. To the extent that use becomes chronic and impairing, then referral for appropriate treatment services will become necessary. Prevention efforts could also be undertaken to reduce or eliminate tobacco consumption in light of long-term physical risks. Second, comorbidity of ADHD and anxiety disorder symptoms may represent higher level of risk, thus necessitating regular assessment of internalizing symptoms among students with ADHD. Given the relatively high rate of anxiety disorder among college students with ADHD (Anastopoulos et al., 2018), this risk factor is particularly salient. Third, the fact that executive functioning deficits are associated with greater use of tobacco and cannabis highlights the importance of addressing these deficits through academic support services. Efforts to improve planning, time management, and organizational skills of students with ADHD may not only enhance executive functioning but could also indirectly impact substance use; however, this contention requires controlled investigation. Finally, counseling and academic support should emphasize strategies to improve student motivation to complete

assigned responsibilities as a focus on motivation may indirectly address student use of illicit substances.

The results of this study have particular relevance to disability services providers in college and university settings. As more research establishing the relationship between ADHD and substance use in college students is emerging, disability service providers at universities may serve in a unique position to initiate conversations with administrators, parents, and students sharing these findings and emphasizing the importance of addressing risky substance use behaviors as part of disability service provision. Additionally, given the finding that ADHD diagnosis only accounted for 3.7% of variance between groups, it is important to focus on other factors (e.g., peer influences, social norms in college) that may be contributing to group differences and how those factors may uniquely influence college students with ADHD in terms of proclivity towards substance use.

Overall, there are few studies that have focused on the efficacy of psychosocial interventions among college students with ADHD (DuPaul & Weyandt, 2009; Green & Rabiner, 2012). Recent studies have demonstrated the effectiveness of combined intervention efforts involving long-term (i.e., semester- and year-long), individual mentoring focusing on study skills (e.g., organization strategies and time management), elements of cognitive behavioral therapy (e.g., psychoeducation and coping skills for managing impairment in executive functioning), and a supportive mentor-student relationship (Allsop, Minskoff, & Bolt, 2005; Anastopoulos & King, 2015). However, none of these strategies have been investigated in terms of their impact on outcomes related to substance use. Future research should examine how specific interventions provided through disability service offices at colleges and universities may impact substance use behaviors, particularly in students with ADHD.

Conclusions

This is the largest study conducted to examine alcohol and substance use among college students with ADHD. Consistent with prior adult ADHD studies, first year college students with ADHD were more likely to use tobacco, cannabis, and illicit drugs than were their non-ADHD peers. Although this group difference was in the small to medium range, this finding has clear clinical implications given the physical and mental health risks associated with substance use. Groups did not differ regarding alcohol use, presumably due in large part to the fact that alcohol use is highly prevalent in the general college population (Molina et al., 2007). It is important to note

that ADHD diagnostic status alone only accounted for about 4% of the differences between groups, thus we also examined other variables that may impact substance use in this population. A variety of factors were correlated with substance use, chiefly executive functioning deficits, anxiety disorder symptoms, and lower academic motivation. Additional longitudinal research is necessary to identify variables associated with ongoing substance use in college students with ADHD so as to inform screening, prevention, and intervention efforts.

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Table 1

Participant Demographic Data

	ADHD	*Comparison*
Original Sample	%	%
Gender (% female)	52.2	51.3
Ethnicity		
Hispanic	10.5	10.1
Race		
Caucasian	76.8	66.7
African American	11.0	13.6
Asian	2.6	8.3
Multiracial	4.4	3.5
Other	5.3	7.9
	M (SD)	*M (SD)*
Age (years)	18.27 (.58)	18.19 (.46)
ADHD Analytic Sample (n=207)	%	
Gender (% female)	53.6	
Ethnicity		
Hispanic	10.6	
Race		
Caucasian	76.3	
African American	12.1	
Asian	2.9	
Multiracial	3.4	
Other	5.3	
	M (SD)	
Age (years)	18.25 (.54)	

Note. Attention-deficit/hyperactivity disorder (ADHD) group *n* = 228, Comparison group *n* = 228.

Table 2

ADHD Sample Means and Standard Deviations

	M	SD	Skewness	Kurtosis
CAARS DSM-IV IN	77.93	12.10	.04	-.34
CAARS DSM-IV HI	62.95	13.39	-.33	1.64
BRIEF Global Executive	65.32	10.09	.05	-.46
Total CD Severity	.18	.43	2.25	4.19
BDI Total	15.40	9.39	.83	.12
BAI Total	14.23	11.05	1.27	1.50
LASSI				
Concentration	18.76	6.18	.57	-.13
Motivation	28.79	6.09	-.45	-.09
AIM				
Performance and Daily Functioning	50.29	19.12	.10	-.40
Relationships/Communication	70.30	19.46	-.82	.39
Total ADHD Knowledge				
Correct Score	23.98	6.28	.27	.19
Overall Score	61.45	10.69	-.06	.01
Total Tobacco Use	.99	1.41	1.22	.34
Total Alcohol Use	6.46	6.63	1.35	1.28
Total Cannabis Use	4.60	7.10	2.02	4.21
Total Other Drug Use	.43	1.11	2.67	6.68

Note. IN = inattention; HI = hyperactivity-impulsivity

Table 3

ADHD and Control Group Differences

	df	F	p value	Cohen's d	ηp^2
Alcohol	1	3.512	.062	0.18	.008
Tobacco	1	9.963	.002	0.30	.023
Cannabis	1	11.505	.001	0.30	.027
Other Drugs	1	12.187	.001	0.33	.028

Table 4

Final Regression Model for Alcohol Use

	β	R	R²	Adjusted R²	F
		.28	.08	.07	9.52**
Gender	.28**				
Race	-.04				
Ethnicity	-.09				
Parent Highest Education Level	.16				

*Note. **p < .01*

Table 5

Final Regression Model for Tobacco Use

	β	R	R2	Adjusted R²	F
		.38	.15	.12	6.32***
Gender	.22*				
Race	-.04				
Ethnicity	.04				
Parent Highest Education Level	-.01				
CAARS IN	-.01				
CAARS Hyperactive-Impulsive	.04				
BRIEF Global	.23*				
Conduct Disorder Symptoms	.11				
BAI Total Score	.20*				
BDI Total Score	.11				

Note. CAARS = Conners Adult ADHD Rating Scale. BRIEF = Behavior Rating Inventory of Executive Functioning. BAI = Beck Anxiety Inventory. BDI = Beck Depression Inventory *** $p < .001$
*$p < .05$

Table 6

Final Regression Model for Cannabis Use

	β	R	R²	Adjusted R²	F
		.24	.06	.05	6.79*
Gender	.18				
Race	-.02				
Ethnicity	-.01				
Parent Highest Education Level	.05				
CAARS Inattention	.03				
CAARS Hyperactive-Impulsive	.04				
BRIEF Global	.24*				

Note. CAARS = Conners Adult ADHD Rating Scale. BRIEF = Behavior Rating Inventory of Executive Functioning. *p < .05

Table 7

Final Regression Model for Other Drug Use

	β	R	R²	Adjusted R²	F
		.43	.18	.16	8.13***
Gender	.09				
Race	.03				
Ethnicity	-.11				
Parent Highest Education Level	.03				
CAARS IN	-.04				
CAARS Hyperactive-Impulsive	.12				
BRIEF Global	.17				
Conduct Disorder Symptoms	-.02				
BAI Total Score	.21*				
BDI Total Score	-.07				
AIM Daily Functioning	.12				
AIM Relationships	-.11				
LASSI Concentration	.07				
LASSI Motivation	-.22*				

Note. CAARS = Conners Adult ADHD Rating Scale. BRIEF = Behavior Rating Inventory of Executive Functioning. BAI = Beck Anxiety Inventory. BDI = Beck Depression Inventory. AIM = . LASSI = Learning and Study Strategy Inventory. ***p < .001 *p < .05

Identifying Challenges and Benefits of Online Education for Students with a Psychiatric Disability

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Abstract

Students with a psychiatric disability (PD) represent a growing demographic on college campuses nationwide. Concurrently, the ubiquity of online learning has served as a powerful accessibility tool for students with a PD to obtain postsecondary education and may possess certain benefits for this population over traditional classroom learning. This study collected surveys from 1,665 college students taking online courses at a large northeastern public university in the Spring 2015 semester. We assessed the frequencies of response selections by students with a PD when answering questions related to why they chose to take an online course, and the benefits and challenges associated with online courses. Additionally, we conducted chi-square analyses comparing the responses of students with a PD to those without a PD to assess between group differences. Results indicated similarities between the groups regarding the benefits of online learning as well as reasons for choosing to enroll in an online course. However, there were differences in perceived challenges to online learning. Specifically, students with a PD endorsed the challenges of time management, difficulty concentrating, and difficulty navigating the course website at a higher rate than students without a PD.

Keywords: online learning, psychiatric disability, postsecondary education

For people with a psychiatric disability (PD), postsecondary education can serve as a critical component to living a fulfilling and independent life. Attaining higher education helps to build human capital and contributes to higher employment rates and wages for all people (Borjas, 2005), but may be of particular importance for those with a PD (Gao, Schmidt, Gill, & Pratt, 2011). People with a PD have lower rates of full-time employment, higher rates of being out of the labor force, and lower rates of pay when working compared to those without a PD; but education is strongly associated with positive employment outcomes among people with a PD and provides an important opportunity (Luciano & Meara, 2014).

It is concerning then that students with a PD are at higher risk for low educational attainment (American College Health Association, 2012; Hunt, Eisenberg, & Kilbourne, 2010; Hysenbegasi, Hass, & Rowland, 2005; Waghorn, Still, Chant, & Whiteford, 2004) and drop out of college at a higher rate than their peers without a PD (64% and 41%, respectively; Breslau, Lane, Sampson, & Kessler, 2008; Ginder & Kel-

ly-Reid, 2013; Gruttadaro & Crudo, 2012; Hunt et al., 2010). Psychiatric disabilities account for 3.2 to 11.4% of college non-completion (Mojtabai et al., 2015). Mental health problems and severity have been associated with decreases in academic functioning and lower grade point average (GPA; Andrews & Wilding, 2004; Bruffaerts et al., 2018; DeLuca, Franklin, Yueqi, Johnson, & Brownson, 2016; Eisenberg, Golberstein & Hunt, 2009). Decreases of between 0.17 and 0.49 points in GPA have been reported depending on the psychiatric diagnosis; this decrease is associated with a drop in academic level from the 50th percentile to the mid-30th percentile (Bruffaerts et al., 2018; Eisenberg et al., 2009; Hysenbegasi, Hass, & Rowland, 2005). Despite these poor outcomes, people with PD are on college campuses working toward their degrees. Students with a PD represent one of the largest disability sub-groups on college campuses (Government Accountability Office, 2009; Kupferman & Schultz, 2015).

Individuals with a PD can, as part of their psychiatric condition, experience a variety of symptoms and

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functional limitations that may negatively impact a student's ability to be successful in school. Cognitive impairments related to dysfunction in attention, short and long-term memory, processing speed, impaired recall, and general motor speed are often present in people with a PD and are listed as a diagnostic symptom for several psychiatric conditions (American Psychiatric Association, 2013; Bora, Yucel, & Pantelis, 2010; Castaneda, Tuulio-Henriksson, Marttunen, Suvisaari, & Lonnquist, 2008; Crow, 2008; Grabinger, 2010; Johnsen & Asbjornsen, 2008; LaGarde, Doyon, & Brunet, 2010; Malhi et al., 2007; McClintock, Husain, Greer, & Cullum, 2010; Tempesta et al., 2013). Impairments related to executive functioning are particularly relevant to academic performance, and consistently present among people with a PD (Keefe & Fenton, 2007; Wexler & Bell, 2005). Response inhibition, verbal and visual working memory, procedural memory, and planning are the specific areas of executive functioning that are most frequently impaired in someone with a PD (Altshuler et al., 2004; Bora et al., 2010; LaGarde et al., 2010; Snyder, 2013; Snyder, Kaiser, Warren, & Heller, 2015; Tempesta et al., 2013).

Social abilities may also be impacted by psychiatric disabilities (PDs; Grabinger, 2010), including deficits believed to be related, at least in part, to problems with social cognition (Bora, Bartholomeusz, & Pantelis, 2016). These can manifest as impaired social adjustment, difficulty inferring and reasoning about others' intentions, and bias toward negative interpretations of emotions (Bora et al., 2016; Buhlmann, Wacker, & Dziobek, 2015; Ladegaard, Larsen, Videbech, & Lysaker, 2014; Loi, Vaidya, & Paradiso, 2013; Savla, Vella, Armstrong, Penn, & Twamley, 2013; Schreiter, Pijnenborg, & aan het Rot, 2013; Weightman, Air, & Baune, 2014). For students these can translate into challenges getting along with others, reading social cues, difficulty approaching instructors, and struggles accepting and responding to negative feedback and interpreting criticism (Rickerson, Souma, & Burgstahler, 2004).

Other symptoms of PDs and associated medication side effects can create additional challenges such as drowsiness, blurred vision, hand tremors, and difficulty initiating contact (Rickerson et al., 2004). While some may assume these types of impairments are only present in individuals with the most severe types of PDs, such as schizophrenia (Keefe & Fenton, 2007), they are actually also present in conditions more commonly found on college campuses, including bipolar disorder, major depression, generalized anxiety disorder, post-traumatic stress disorder, obsessive compulsive disorder, and social anxiety (Bora

et al., 2010; 2016; Buhlmann et al., 2015; Castaneda et al., 2008; Johnsen & Asbjornsen, 2008; Ladegaard et al., 2014; LaGarde et al., 2010; Loi et al., 2013; McClintock et al., 2010; Malhi et al., 2007; Ritter, Bruck, Jacob, Wildgruber, & Kreifelts, 2015; Savla et al., 2013; Schreiter et al., 2013; Snyder, 2013; Snyder et al., 2015; Tempesta et al., 2013; Weightman et al., 2014). There are also indications that these impairments may persist even when psychiatric symptoms remit, suggesting a more chronic underlying dysfunctional cognitive condition, although these findings are inconsistent (Air, Weightman, & Baune, 2015; Altshuler et al., 2004; Kim, Park, Shin, & Kwon, 2002; Roh et al., 2005).

In addition to the aforementioned impairments, students with a PD may not access disability services that could be helpful to addressing barriers. Students with a PD are not always knowledgeable about disability services. Unlike students with some other disabilities, students with a PD often begin experiencing symptoms in college and therefore do not have previous experience with these kinds of accommodations or supports (Belch, 2011). They may not even be aware that they could qualify for disability services (Collins & Mowbray, 2005). Additionally, students may be concerned about the impact of disclosing their disability and the associated stigma (Collins & Mowbray, 2005; Keefe, 2007; Olney & Brockelman, 2003).

In the past, disability service providers may have felt unprepared to provide support to students with a PD (Unger, 1991), but efforts have been made to identify functional limitations and associated accommodations for students with a PD taking classes on campus (Collins & Mowbray, 2005; National Council on Disability, 2017; Rickerson et al., 2004; Weiner & Weiner, 1996). When students with a PD are provided with effective services and supports they are more likely to be successful (Kiuhara & Huefner, 2008; Salzer, Wick, & Rogers, 2008). Far less is known, however, about how to support students with a PD in the online learning environment.

Overall, the prevalence of online courses has grown substantially in recent years, with a survey of college and university presidents indicating that 77% of their institutions offer online courses (Parker, Lenhart, & Moore, 2011). Twenty-eight percent of all students report taking at least one online course, representing a continued growth rate for distance education enrollment (Allen, Seaman, Poulin, & Straut, 2016; U.S. Department of Education, 2016). Online education is appealing to schools because of its cost effectiveness (Mehrotra, Hollister, & McGahey, 2001) and its ability to reach students who are not local,

are nontraditional students, or require a high level of flexibility (Denton, 2001). Similarly, online education is beneficial for students who may previously have been limited by physical location and distance from a college or university, restricted transportation options, and lack of schedule flexibility. Additionally, online education increases the availability of course and program options (Grabinger, 2010).

The literature related to accommodations in online education for students with physical disabilities is extensive; it exists in a limited way for students with cognitive impairments and is just emerging for students with a PD (Keeler & Horney, 2007). It is important for us to develop a better understanding of the experience of students with a PD in the online environment in order to ultimately better support them in their educational efforts. This is particularly true as online education may offer benefits of particular interest to students with a PD as it may help address specific challenges they experience. For example, the asynchronous format that is common with online learning may allow students with a PD more time to process the information provided by the professor, as well as more time to formulate responses to questions (Banerjee & Brinckerhoff, 2002). Additionally, students who experience social anxiety related to their condition do not have to place themselves in the in-person classroom environment that may exacerbate symptoms. Furthermore, students who take medications to manage their PD may be able to minimize the impact of side effects more effectively by scheduling school and study time to coincide with their peak functioning during the day (Mowbray, Bybee, & Collins, 2001).

It is also possible that online education may pose unique barriers for students with a PD based on associated symptoms and functional impairments. Challenges may result from the heavily visual and written mediums used in online courses for students with receptive and expressive language impairments. Additionally, the lack of visual and audio input can make it difficult for students to interpret the intentions and emotional context of their professor and peers' communication. This can lead to difficulty developing relationships with professors and peers, potentially leading to a lack of important academic support. Asynchronous learning environments can easily become confusing and overwhelming without a linear presentation of materials. Executive functioning impairments can also make following written directions and multi-step instructions challenging (Banerjee & Brinckerhoff, 2002). Deficits in executive functioning can also lead to difficulties with problem solving and lack of persistence in resolving technical issues

that may arise from the online environment, such as broken web links and other problems related to inaccessible content. Challenges with memory can make navigating websites difficult, causing the student to forget where they began and how to navigate further (Rowland, 2004).

These potential benefits and challenges of online education for students with a PD are largely speculative due to the limited empirical work in this area. To determine what supports are needed to help facilitate the success of students with a PD in online education, these benefits and challenges need to be explored. To this end, the current survey research was conducted to assess, from the students' perspective, reasons for enrolling in an online course, the benefits of online courses, and the challenges of taking an online course. This study is intended to be a modest initial step toward understanding the experiences of students with a PD in postsecondary online education. We have also presented a comparison of the responses of students with a PD to those without a PD as we anticipated that a reasonable follow-up question, after reviewing the answers of students with a PD, would be, "Are these responses similar to or different from students without a PD?"

Method

Participants

Participants were recruited from a large public northeastern university. This university ranks highly in terms of socioeconomic, geographic, and ethnical diversity. It has campuses in both urban and suburban locations and has a large online presence. This high level of diversity helps to ensure that a wide range of students were invited to participate in this study. One thousand, six hundred and sixty-five students completed the survey (response rate of 10.8%). Of the total participants, 286 (17.2%) self-reported having a diagnosis of a PD. The majority of participants were female (75%) and had at least some experience with online education prior to the current semester. The full range of years of education was represented, as were the areas of study concentration (see Tables 1 and 2). The overall average age of participants was 26.22 (*SD* = 9.03), with students with a PD averaging 27.34 (*SD* = 9.11) years old and those without a PD averaging 25.98 (*SD* = 9.0) years old. Among students who indicated they had been diagnosed with a PD, the most commonly reported diagnoses were depression (68.2%) and anxiety disorders (57.7%), followed by eating disorders (12.6%), obsessive-compulsive disorder (9.4%), bipolar disorder (7.3%), and schizophrenia or schizoaffective disorder (1.4%). It

should be noted that students had the option to report more than one PD. Participants reported using a variety of online Learning Management Systems (LMS) affiliated with the university to access course content, including Pearson eCollege, Sakai, Moodle, Canvas, and Blackboard.

Procedure

Recruitment. Students enrolled in online courses during the Spring 2015 semester were recruited via electronic communication. Potential participants were identified by the university's registrar, who used enrollment codes to identify all students enrolled in at least one online, for-credit course that semester. At the end of March 2015, the principal investigator sent to the identified students (using their university email addresses) an email that contained a brief explanation of the study, an invitation to participate, and a link to the informed consent and research survey. The link redirected participants to REDCap, a secure web application used by research institutions for the purpose of securely administering surveys and safeguarding confidential participant data.

After reading an overview of the study and providing informed consent, participants were administered the survey through REDCap. There were no exclusionary criteria for this study. Participants were given the option to provide their personal information in order to enter a random drawing to receive one of two $50 Visa Gift Cards. This personal information was not linked to their survey responses. Two follow-up emails were sent (following the initial study announcement) to remind students of the opportunity to participate. Via email, the principal investigator answered all questions and concerns raised by potential participants. The University's Institutional Review Board approved this study.

Survey. The survey contained 20 multiple-choice questions and was designed specifically for this study (see Table 3). The survey asked: two demographic questions related to age and gender; five questions related to the presence of a disability, services to treat the disability, impact the disability has had on passing traditional/in person courses and online courses, and registration with campus disability services; and four questions about the student's field of study, year in school, experience with online learning, and current learning management system (LMS). The remaining questions addressed the student's main reason(s) for choosing to enroll in an online course, the benefits the student has experienced from being in an online course, and the challenges the student has experienced from being in an online course. The response options students could choose from to indicate reasons for choosing to enroll, benefits of online courses, and challenges of online courses were developed by the authors and informed by the literature on cognitive and social impairments related to PDs, input of disability service providers, students with PDs, and providers of Supported Education services to individuals with PDs. Due to the very limited research available specific to postsecondary education for students with a PD in online courses, expert experience had to be the primary basis for response options. Initial response options were drafted and reviewed by an expert provider and researcher in Supported Education.

For each of the questions of primary interest (i.e., reasons for enrolling, benefits, and challenges) participants were asked to select all of the response options that applied to their experience and then to identify, of all of the options that applied to them, which of those responses was the single most important factor. By asking the questions in this manner we were able to assess all of the responses that were applicable to the student, but then also identify which of those responses was most critical.

Data Analysis

Independent samples t tests and chi-square analyses were used to assess differences in participant demographics and educational experiences at baseline between those who reported being diagnosed with a PD and those who did not. Descriptive analyses were conducted to compute frequencies of student responses. Chi-square analyses were used to assess differences in the frequency distributions of responses to survey questions between students with and without psychiatric disabilities. Parametric statistics were originally planned for this analysis, but due to the non-normal distribution of the data, nonparametric statistics were used.

Results

There were baseline differences in age, gender, year in school, and level of experience with online courses. Students with a PD were older than those without, $t(1663) = -2.31$, $p < .05$; there were more males without a PD and more females with a PD, $\chi^2(2) = 15.77$, $p < .001$; a greater proportion of students without a PD were in their first or second year of education, while more of those with a PD were in graduate school, $\chi^2(4) = 16.52$, $p < .01$; and more students without a PD were taking their first online course, while more students with a PD had some previous experience with online courses or took almost all of their courses online, $\chi^2(2) = 16.97$, $p < .001$. While group equivalency would have minimized the poten-

tial impact of these demographic and background factors on our variables of interest, group equivalency is nearly impossible when assessing existing groups.

Among students who reported a PD, the majority was currently receiving, or had previously received, treatment for their PD (85.6%). Only a small proportion of these students were currently (6.3%) or previously (6.0%) registered with campus disability services. One-third (33.1%) of students with a PD reported that their symptoms have gotten in the way of receiving a passing grade in a traditional/in-person course, while only 9.9% reported the same for an online course.

Table 4 presents the participant responses to the question "What are your main reason(s) for choosing to enroll in an online course?" Students with a PD most frequently indicated the following responses: convenience, flexibility of schedule, better fit around work schedule, avoiding commuting, the course only being offered online, and the ability to learn at their own pace. Students both with and without a PD endorsed about half of the response options in equal proportions. However, students with a PD selected flexibility of schedule, avoiding commuting, better able to manage family responsibilities, feel more comfortable learning at home, social anxiety concerns, and management of mental health symptoms in greater proportions than students without a PD. When asked to select the single most important reason they chose to enroll in an online course, both groups endorsed flexibility of schedule as most important. Convenience, better fit around work schedule, and course only being offered online were other items a large percent of students indicated were most important, but in somewhat different proportions between groups (see Table 5).

In response to the statement, "Select the benefits you experience from being in an online course," students with a PD most highly endorsed these responses: more flexibility, longer to formulate responses, reduced anxiety, increased study time, and more comfort interacting online. Students with and without a PD selected similar benefits in largely equal proportions. The only differences between students with and without a PD were that students with a PD selected the benefits of reduced anxiety and easier to manage mental health symptoms in larger proportions (see Table 6). The single most important benefit of being in an online course was reported as more flexibility for both students with and without a PD (see Table 5).

Students were also asked to "Select the challenges you experience from being in an online course." Of the 14 challenges listed, students with a PD selected lack of in-person contact with professor, time management, no hands-on learning, lack of self-motivation, and difficulty concentrating/focusing most often. In comparison to students without a PD, students with a PD selected in greater proportions the following items: time management, difficulty concentrating/focusing, difficulty navigating through the course website, and psychiatric symptom interference. Students with and without a PD similarly endorsed all other items (see Table 7). In terms of the single biggest challenge experienced by students, there was less consensus than with the previous two topics. Lack of in-person contact with the professor and time management were the most often selected, but lack of self-motivation, no hands-on (live) learning, and difficulty concentrating/focusing were also selected in varying proportions by students with and without a PD (see Table 5).

Discussion

This study sought to add to the nascent literature regarding postsecondary online learning for students with a PD. We asked, from the student's perspective, what are reasons for enrolling in online courses, what are the benefits of taking online courses, and what are the challenges to taking online courses. Additionally, a comparison of the responses to these questions from students with and without a PD was conducted. In terms of students' reasons for choosing to take an online course the most highly endorsed reasons were similar for all students and highlighted convenience and flexibility. There were some differences between students with and without a PD in that students with a PD selected flexibility, avoiding commuting, better managing responsibilities, and more comfortable learning at home at a higher rate. Largely students both with and without a PD felt similarly about the benefits they experience from being in an online course. All students indicated that the flexibility of online courses was the most significant benefit. Regarding the challenges students experienced, both students with and without a PD indicated that lack of in-person contact with the professor, time management, and no hands-on learning were primary challenges. However, there were some differences between the frequency with which some challenges were endorsed between groups. Students with a PD reported time management, difficulty concentrating, and difficulty navigating the course website as challenges they experienced at higher rates than students without a PD.

In addition to the above differences between responses from students with and without a PD, there were differences related to mental health symptoms.

These differences are not surprising, since students without a PD are not likely to endorse these responses. It is interesting to note, however, that even among students with a PD, concerns related to mental health symptoms did not largely contribute to the choice to take an online course or to the challenges experienced with online courses. Reduced anxiety was endorsed at a fairly high rate (almost a third of participants) as a benefit to online courses though.

Overall, students with a PD indicated they choose to take online courses and identified benefits of online courses that were very similar to students without a PD. The differences to note are related to challenges experienced in online courses. The challenges of time management, difficulty concentrating, and navigating the course website may be related to the cognitive and executive functioning impairments that many people with a PD experience (Green, Kern, & Heaton, 2004, LaGarde et al., 2010; Snyder, 2013; Snyder et al., 2015; Tempesta et al., 2013).

Specific accommodations to address these challenges for students with a PD in online learning environments have not been explicated in the literature, although some initial recommendations have been made (see Grabinger, 2010; Grabinger, Aplin, & Ponnappa-Brenner, 2008). Disability services providers may want to consider that students with a PD in online courses could be supported by developing strategies to create structure to help with time management, as the lack of structure in online courses may be contributing to this challenge. Cognitive remediation interventions may be able to help students with a PD compensate for challenges associated with concentration and focus (Mullen et al., 2017).

Some have suggested utilizing Universal Design for Learning (UDL) strategies to minimize, if not eliminate, the need for individual accommodations (Crow, 2008; Grabinger et al., 2008; Rickerson et al., 2004). UDL helps to make courses more accessible for all students (Rose, 2000). Instructors may also want to use the Quality Matters rubric which provides guidelines that draw upon current best practices in the realm of web course design, display of content, and accessibility, and is collaboratively peer-reviewed (Legon & Runyon, 2007). Merging the two resources, or using UDL principles to develop the course and then Quality Matters to monitor the quality of content on an ongoing basis, holds promise for designing an accessible course and helping facilitate favorable student learning outcomes (Robinson & Wizer, 2016). Additional research is clearly needed to assess the effectiveness of specific accommodations, interventions, and/or course structures on the success of students with a PD in postsecondary online environments.

Limitations

The results of this survey are limited as a result of being from only one university thus potentially reducing the generalizability of its findings. However, the school is a large state university with a diverse student body and a wide variety of majors, years in school, and experience with online education. Additionally, there was a low survey response rate for this study. Online survey response rates are generally lower than those of paper-based administration, but the current response rate was lower than that typically found for online surveys (Nulty, 2008). The literature suggests average online survey response rates of 33%, whereas the response rate for this study was 11%. This could further limit the generalizability of the findings. To address these limitations additional research should be done across a diverse array of postsecondary institutions with a larger sample of individuals with a PD.

Conclusions

Improving educational outcomes for students with a PD is critical to positively impacting future employment and wages (Bureau of Labor Statistics, 2017). Online education presents an opportunity for students with a PD who may experience barriers related to traditional, in-person courses; however, it may also present its own unique challenges. The results of this survey research suggest that students with and without a PD experience similar benefits from online education, but students with a PD experience some challenges differently or to a higher degree. Additional work is needed in this area to further explore the challenges and barriers experienced by students with a PD in online courses and to identify and assess the effectiveness of strategies to mitigate these challenges.

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Table 1

Demographics and Online Experience of Sample

Variable	Total Sample	Psychiatric Disability	No Psychiatric Disability
	Mean (SD)	Mean (SD)	Mean (SD)
Age	26.22 (9.03)	27.34 (9.11)	25.98 (9.00)
	n (%)	*n* (%)	*n* (%)
Sex			
Male	416 (25.0)	45 (15.7)	371 (26.9)
Female	1249 (75.0)	241 (84.3)	1008 (73.1)
Year of Study			
Freshman	153 (9.2)	20 (7.0)	133 (9.6)
Sophomore	223 (13.4)	21 (7.3)	202 (14.6)
Junior	365 (21.9)	62 (21.7)	303 (22.0)
Senior	404 (24.3)	75 (26.2)	329 (23.9)
Graduate Student	520 (31.2)	108 (37.8)	412 (29.9)
Online Experience			
First Online Course	562 (33.8)	68 (23.8)	494 (35.8)
Some Exp w/ Online Courses	925 (55.6)	177 (61.9)	748 (54.2)
All/Almost All Courses Online	178 (10.7)	41 (14.3)	137 (9.9)

Table 2

Areas of Study Concentration for Sample

Major	Total Sample	Psychiatric Disability	No Psychiatric Disability
	n (%)	*n* (%)	*n* (%)
Business	302 (18.1)	39 (13.6)	263 (19.1)
Engineer/Computer/Science/Math	150 (9.0)	15 (5.2)	135 (9.8)
Education	112 (6.7)	22 (7.7)	90 (6.5)
Health	450 (27.0)	63 (22.0)	387 (28.1)
Humanities	94 (5.6)	26 (9.1)	68 (4.9)
Communications	101 (6.1)	18 (6.3)	83 (6.0)
Life/Physical Sciences	261 (15.7)	37 (12.9)	224 (16.2)
Social/Behavioral Sciences	324 (19.5)	79 (27.6)	245 (17.8)
Visual/Performing Arts	26 (1.6)	11 (3.8)	15 (1.1)
Undeclared	35 (2.1)	5 (1.7)	30 (2.2)
Other	189 (11.4)	39 (13.6)	150 (10.9)

Table 3

Survey Questions

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1. How old are you?
2. What is your gender?
3. Have you ever been diagnosed with any of the following conditions? (select all that apply)
   a) Schizophrenia or Schizoaffective Disorder
   b) Anxiety Disorder (e.g., Generalized Anxiety Disorder, Social Phobia, Panic Disorder)
   c) Depression
   d) Bipolar Disorder
   e) Obsessive-Compulsive Disorder
   f) Eating Disorder
   g) Learning Disability (e.g., ADD, ADHD, Dyslexia)
   h) History of Traumatic Brain Injury
   i) Physical Disability (Please Specify)
   j) Other (Please Specify)
   k) None
4. Are you currently receiving services to manage and/or treat the condition(s) noted in Question #3? (e.g., counselor, therapist, doctor)
5. Have symptoms from the condition(s) you noted in Question #3 ever gotten in the way of you receiving a passing grade in a traditional/in-person college classroom?
   l) Yes
   m) No
   n) Unsure
6. Have symptoms from the condition(s) you noted in Question #3 ever gotten in the way of you receiving a passing grade in an online class?
   a) Yes
   b) No
   c) Unsure
7. Are you currently registered with Campus Disability Services and/or the Disability Office at your college?
8. Which of these fields best describes your major, or anticipated major? You may indicate more than one if applicable.
9. What year of study best describes you?
10. What is your current level of experience with online learning at the college level?
11. What Learning Management System (LMS) are you currently using to take your online course(s)?
12. What are your main reason(s) for choosing to enroll in an online course? (Choose all that apply)
    a) Better manage family responsibilities
    b) Convenience
    c) Lack of transportation
    d) Avoid commuting
    e) Management of mental health symptoms
    f) Better fit around work schedule
    g) Enjoy online learning format
    h) Class was only offered online
    i) Flexibility of schedule
    j) More comfortable learning at home
    k) Ability to learn/process info at own pace
    l) Social anxiety concerns
    m) Other (please specify)
13. Of the reasons marked above, select the single most important reason you choose an online course.

14. Select the benefit(s) you experienced from being in an online class. (Choose all that apply)
    a) Reduced anxiety
    b) Easier to manage mental health symptoms
    c) Limited distractions
    d) More flexibility
    e) Longer period to formulate responses
    f) Increased study time
    g) Money saved
    h) No need for text book/ E-text book is cheaper option
    i) Increased contact/support from peers
    j) More detailed instruction/ learning material
    k) More comfortable interacting online
    l) No benefits observed
    m) Other (Please Specify)
15. Of the benefits marked above, select the single most important benefit.
16. Select the challenges you experienced from being in an online class. (Choose all that apply)
    a) Lack of support from disabilities office
    b) Difficulty navigating through course website
    c) Time management
    d) Inability to communicate effectively though email, chat or forums
    e) Lack of in-person one-on-one contact with professor
    f) Lack of technical skills
    g) No hands on (live) learning
    h) Decrease possibility of social interaction
    i) Physical limitations (Please Specify)
    j) Difficulty understanding online speech/ social cues
    k) Lack of self-motivation
    l) Psychiatric symptom interference
    m) Difficulty concentrating/ focusing
    n) No challenges observed
    o) Other (Please Specify)
17. Of the challenges marked above, select the single biggest challenge.
18. Overall, do you feel as though you have benefited from taking an online class?
19. If there's anything else you'd like us to know about your experiences, (both positive and negative) with online learning at your school, please feel free to write it in here
20. If you could change one thing about online learning (big or small) what would it be?

Table 4

Reasons for Choosing to Enroll in an Online Course

Reason	Psychiatric Disability (%)	No Psychiatric Disability (%)	χ^2 $df=1$	p
Convenience	74.1	70.2	1.77	.18
Flexibility of Schedule	70.3	64.3	3.71	.05
Better Fit Around Work Schedule	59.1	57.1	0.39	.53
Avoid Commuting	37.1	30.2	5.12	.02
Course Only Offered Online	34.3	33.9	0.02	.89
Ability to Learn at Own Pace	32.5	29.1	1.34	.25
Better Manage Family Resp.	28.3	19.7	10.48	<.01
More Comfort. Learning at Home	27.6	19.4	9.82	<.01
Enjoy Online Learning Format	23.1	19.2	2.22	.14
Social Anxiety Concerns	14.0	3.1	59.07	<.001
Manage Mental Health Symptoms	8.4	0.4	84.75	<.001
Lack of Transportation	7.3	7.5	0.01	.91
Other	5.2	6.0	0.26	.61

Table 5

Response Options Within Each Question Most Frequently Indicated as the "Most Important"

Response	No Psychiatric Disability (%)	Psychiatric Disability (%)
Choose to Enroll		
Flexibility of Schedule	23.4	21.4
Convenience	19.7	18.2
Better Fit Around Work Schedule	19.2	17.2
Course Only Offered Online	18.1	21.1
Benefit of Online Course		
More Flexibility	69.3	63.6
Challenges of Online Course		
Lack of In-Person Contact w/ Professor	30.9	25.8
Time Management	17.0	21.7
Lack of Self-Motivation	11.8	13.8
No Hands On (Live) Learning	9.0	6.3
Difficulty Concentrating/Focusing	5.0	7.9

Table 6

Benefits Experienced from Being in an Online Course

Reason	Psychiatric Disability (%)	No Psychiatric Disability (%)	χ^2 df=1	p
More Flexibility	79.0	79.7	0.07	.80
Longer to Form Response	44.4	41.6	0.79	.37
Reduced Anxiety	31.8	16.1	38.35	<.001
Increased Study Time	27.6	29.3	0.32	.57
More Comfort Online	23.4	18.6	3.47	.06
No Need for Text/Cheaper	19.9	19.4	0.04	.85
Money Saved	14.3	11.4	1.97	.16
Manage Mental Health Sx	10.8	1.7	61.39	<.001
More Detailed Instruction	7.3	10.9	3.33	.07
Inc. Support from Peers	4.5	5.1	0.18	.67
Other	1.0	2.2	1.55	.21

Table 7

Challenges Experienced Related to Online Course

Reason	Psychiatric Disability (%)	No Psychiatric Disability (%)	χ^2 df=1	p
Lack In-Person Contact w/ Prof.	54.9	51.3	1.25	.26
Time Management	41.3	31.9	9.30	<.01
No Hands-On (Live) Learning	36.0	31.0	2.78	.09
Lack of Self-Motivation	30.1	26.0	1.97	.16
Difficulty Concentrating/Focusing	28.0	19.9	9.11	<.01
Decreased Possibility of Social Int.	25.5	28.8	1.25	.26
Diff. Navigating Course Website	25.5	17.1	11.09	<.01
Inability to Comm. Online	23.1	20.0	1.36	.24
Diff. Understand Online Speech	8.0	8.2	0.01	.93
Other	4.9	5.2	0.05	.82
Lack of Technical Skills	4.9	5.0	0.01	.94
Psychiatric Symptom Interference	4.9	0.1	61.71	<.001
Lack of Support Disability Office	0.7	0.8	0.03	.86
Physical Limitations	0	0.4	1.25	.26

"It's All in Your Head:" Students with Psychiatric Disability Navigating the University Environment

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Abstract

The number of students in higher education with psychiatric disabilities is rising; about one in three undergraduates identify as having some type of mental health condition (U.S. Dept. of Education, 2014). This qualitative study explores the experiences of 14 college students with one or more psychiatric disabilities (PD), who were receiving accommodations at a mid-sized four-year public university. Semi-structured interviews were transcribed, and four major themes were identified through inductive thematic analysis: (a) the effects of stigma on the university experience, (b) the impact and effect of the symptoms of PD for students in the university environment, (c) strategies for coping with the disability in the university environment, and (d) the role of social support from university faculty and staff. The findings of the research, their salience to the educational success of students with PD, and recommendations for improved outcomes are reported.

Keywords: psychiatric disabilities, higher education, college students, student experience, qualitative research, thematic analysis

While decades of research have explored the topic of students with physical and/or learning disabilities in postsecondary settings, it was not until 1990 that students with psychiatric disabilities were also acknowledged, due to judicial rulings under the Americans with Disabilities Act (ADA) (e.g., Blacklock, Benson & Johnson, 2003; Kiuhara & Huefner, 2008). The number of students with psychiatric disability (PD) entering or reentering higher education has continued to rise since 1990 (e.g., Demery, Thirlaway, & Mercer, 2012; National Alliance on Mental Illness [NAMI], 2012; Padron, 2006). Students who identify as having some type of mental health condition now constitute 34.6% of the total undergraduate population at four-year public postsecondary institutions in the United States (U.S. Department of Education, 2014). ADA-recognized psychiatric disabilities include major depression, bipolar disorder and anxiety disorder (which includes post-traumatic stress disorder, or PTSD), schizophrenia, and personality disorders (Kiuhara & Huefner, 2008). College students with psychiatric disabilities face myriad challenges, whether intrapersonal or interpersonal, that can negatively impact their educational experience.

Although the ADA was implemented in 1990 in order to attenuate many of the obstacles to full inclusion in society by individuals with disabilities, prejudice continues toward those with PD who pursue higher education (e.g., Collins & Mowbray, 2005; Sharpe, Bruininks, Blacklock, Benson, & Johnson., 2004; Thompson-Ebanks, 2014).

Challenges stemming from environmental factors such as stigma coupled with inadequate institutional policies pose significant barriers to academic achievement for students with PD. The stress associated with coping with symptoms of their mental health conditions, and ableist discrimination on campus, may have a negative impact on their grades and academic progress (Bruffaerts et al., 2018; Kernan & Wheat, 2004). It has been estimated that nearly 86% of university students with PD withdraw before completing their education (Kessler, Foster, Saunders, & Stang, 1995), which is double the estimated dropout rate of 30-40% for all college students (Porter, 1990). These factors contribute to an achievement gap between students with and without disabilities, such that students with disabilities may ultimately be less likely to complete their degrees (Horn & Berktold, 1999; Hurst

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& Smerdon, 2000; Newman et al., 2011; Wolanin & Steele, 2004). Because others are often unaware of the existence of a psychiatric disability or a learning disability, it may actually be more challenging for students to deal with this type of disabling condition which can require making a stressful decision about whether or not to self-disclose; by contrast, it may be more straightforward for campus accessibility centers to meet the accommodation needs of students with disabilities that are evident, like some mobility limitations or sensory impairments (Adams & Proctor, 2010; Kowalsky & Fresko, 2002; Wilson, Getzel, & Brown, 2000). Research suggests that among all students with disabilities, students with PD may be considered particularly at risk. In a comparison of students with PD and students with learning disabilities (LD), those with PD were older and less likely to graduate than those with LD (McEwan & Downie, 2013). A study of adults with PD who had attended college, but not graduated, found that almost half reported relying on government benefits after leaving school (Megivern, Pellerito, & Mowbray, 2003). In fact, researchers have found that individuals with PD are less likely to be employed than individuals with other types of disabilities (Schindler & Kientz, 2013). It is therefore vital to conduct research in this area to minimize the challenges encountered by this population and improve their overall educational experience (e.g., Demery et al., 2012; Kiuhara & Huefner, 2008; Padron, 2006; Weiner, 1999). Implementing evidence-based interventions and increasing programs and services for students with PD would not only contribute to increased overall retention and graduation rates for colleges, by shrinking the achievement gap between students with and without disabilities, but also improve the employment and career prospects for students with PD who successfully earn bachelor's degrees.

Although students from all walks of life may embark on their college careers with a sense of trepidation about whether one can successfully meet the academic demands of the university environment, these concerns can be compounded by the realities of their mental health conditions for students with PD. Students with PD of all ages experience typical college stress, which can potentially intensify the difficulty of their experience (Demery et al., 2012). A growing body of research describing the internal and the external factors that pose significant challenges for students with PD in the university environment has begun to elucidate the issues.

Obstacles to Success in the University Environment

Psychiatric disorders can manifest in individuals by creating low self-esteem, feelings of inadequacy, lack of confidence, inability to concentrate, and lack of trust (e.g., Knis-Matthews, Bokara, DeMeo, Lepore, & Mavus, 2007; Padron, 2006; Thompson-Ebanks, 2014). Additional symptoms of PD may include anxiety, lack of motivation, hopelessness, memory loss, and impaired concentration. Internal chaos, inability to cope academically, reduced competence in social interactions or normative adult roles, and feelings of being overwhelmed were also expressed as obstacles (Collins & Mowbray, 2005; Dougherty et al., 1993). For students on medication to ameliorate symptoms, medication side-effects can make it difficult to fully function cognitively in an academic setting (Padron, 2006; Schindler & Kientz, 2013).

University students develop perceptions of themselves in response to interactions with the environment, including those with the student body, faculty, staff, administrators, service providers, and even the institutional policies and practices. In studies of self-reported student challenges, the environmental factors that contributed to negative experiences and outcomes were perceived as stigma, discrimination by other students, faculty and staff, lack of awareness, lack of skill and empathy from service providers, and inadequate accommodations (e.g., Blacklock et al., 2003; Padron, 2006; Thompson-Ebanks, 2014). Stigma, in particular, was consistently mentioned in numerous studies by students as a salient obstacle (Blacklock et al., 2003; Demery et al., 2012; Dougherty et al., 1993; Weiner, 1999). Stigma is generally attributed to a lack of awareness and/or education and manifests through university faculty, staff, and fellow students' perceptions of the individual with PD as strange and different, thereby "othering" them (Dougherty et al., 1993).

Being labelled as different can be painfully equated to having "blemished character" (Goffman, 1963). Writing on stigma, Goffman stated that, "By definition, we believe the person with a stigma is not quite human. On this assumption, we exercise varieties of discrimination, through which we effectively, if often unthinkingly, reduce his life chances" (p. 5). The stigmatized individual is thereby devalued, deemed unworthy or deficient, and may be blocked from typical social interactions. One coping mechanism a student described was wearing a smile as a mask so as not to encounter marginalization (Demery et al., 2012). Faculty have also been identified as a source of stigma, whether due to lack of understanding or mistrust of a student's need for accommodations (Blacklock et al., 2003). This attitude among faculty is extremely

damaging, not only to a student's sense of belonging, but to his/her willingness to disclose the disability in order to receive support services (e.g., Demery et al., 2012; Weiner, 1999). Turner and colleagues (2007) identified fear of stigma as a significant factor in students' reluctance to seek mental health treatment; while 72% of university students in the study reported mental health problems, only 4% of those students sought help from campus support services (Turner, Hammond, Gilchrist, & Barlow, 2007). Padron (2006), a university student with severe PD, conducted a study addressing personal struggles with stigma while attending graduate school. The study described the researcher's own experience with the attitude from faculty that students with PD utilizing accommodations were receiving "special treatment."

Supports to Success in the University Environment

Descriptions in the literature of obstacles students encountered as a result of their PD were countered by the supports and accommodations that supported a positive educational experience. One effective approach for assisting students with PD in higher education is the *supported education* model (e.g., Collins & Mowbray, 2005; Dougherty et al., 1993; Hartley, 2010; Unger, 1990). Supported education is defined as:

> Education in integrated settings for people with severe psychiatric disabilities for whom postsecondary education has not traditionally occurred or for people for whom postsecondary education has been interrupted or intermittent as a result of a severe psychiatric disability and who, because of their handicap, need ongoing support services to be successful in the education environment. (Unger, 1990, p. 10)

Services provided as part of this programmatic support model include classes on academic survival skills, outreach to services and resources, and career planning guidance (Collins & Mowbray, 2005).

Studies have found that students universally acknowledged the value of academic supports such as extensions on assignments, preferential seating, extra time for taking tests, and being able to register for classes and obtain textbooks early. In addition, assistance with basic college survival skills such as navigating the university bureaucracy, obtaining financial aid, and being instructed in ways to manage multiple assignments were identified as being critical to positive outcomes (e.g., Knis-Matthews et al., 2007; Megivern et al., 2003; Sharpe et al., 2004). Additional beneficial factors include coordination and collaboration between students, faculty, and service providers

and having well-trained service providers on campus to assist students with referrals to resources (e.g., Blacklock et al., 2003; Collins & Mowbray, 2005; Weiner, 1999).

As with the college student population in general, students with PD need social connections and support from peers. Having connection to and encouragement from others was expressed as a particularly critical underpinning to success for this population (e.g., Dougherty et al., 1993; Weiner, 1999). Research has indicated that taking advantage of campus mental health services was beneficial, as was knowing one's limitations by taking a reduced course load or attending an institution with smaller class sizes (e.g., Knis-Matthews et al., 2007; Sharpe et al., 2004). Furthermore, developing meaningful and attainable goals, celebrating achievements, and creating supports specific to the individual were all identified as valuable strategies for overcoming obstacles (Schindler & Kientz, 2013).

The issue of disclosure was one charged with much apprehension for the students interviewed in multiple studies. On the one hand, disclosure meant receiving accommodations which enabled a greater possibility for academic success. On the other hand, disclosure was often equated with stigma and stereotyping which limited positive social interactions or interactions with faculty (e.g., Dougherty et al., 1993; Weiner, 1999). A number of strategies have been identified by students for coping with the "disclosure dilemma." Some reported adopting a strategy of "feeling people out" to test whether or not they could safely disclose their disability without being negatively judged. At the other end of a range of strategies, some students chose complete non-disclosure, citing that the risk of being stigmatized was too great to compensate for the benefits of accommodations (e.g., Collins & Mowbray, 2005; Knis-Matthews et al., 2007). Nonetheless, recent studies have demonstrated that students who did self-identify and received university support were more confident, had fewer hospitalizations, and felt increased self-efficacy (Martin, 2010).

Higher education is viewed as a vehicle for upward mobility, a part of the American dream; as such it has afforded people of diverse backgrounds the opportunity to improve their lives (Unger, 1990). Studies investigating the experiences of students with PD have shown that, given the opportunity accompanied by adequate support, these students can succeed in higher education. Research among students with PD has helped identify the ways in which support systems and strategies help students achieve their goals in higher education and shed light on how higher education can give individuals with PD a sense of pur-

pose, provide a stabilizing force, and empower them with hope for the future (e.g., Dougherty et al., 1993; Knis-Matthews et al., 2007). It is through increased awareness that the imperative for providing access to higher education to all, regardless of "ability," can be realized. Listening to the voices of students with PD and understanding how their conditions impact their functioning in the university environment creates awareness about their unique experiences in order to help foster their success in higher education.

The goal of this qualitative study is to elicit greater understanding of how students with psychiatric disability experience the university environment. Postsecondary institutions present distinct challenges to these students in both academic and social domains. The purpose of the study reported here is to give students with PD the opportunity to describe the ways in which their educational experience is impacted, to broaden awareness of the complexity of psychiatric disabilities and, in doing so, to provide insight which can guide the development of more inclusive university environments so that the achievement gap can be narrowed.

Method

Participants

The current study took place on the mid-sized campus of a four-year public university in California. Using a purposive sampling method, 14 students who self-identified as having a psychiatric disability and were receiving institutional accommodations participated; they are a subset of a larger study of 45 students with various disabilities and learning differences (Chin-Newman, Nair, & Smith, 2017).

Participants included 10 females and four males who were between 19 and 64 years of age, with a mean age of 35.2 years; 13 were non-traditional aged (over age 25) and 1 was traditional aged (under age 25). Ethnicities were reported as: White ($n = 3$), African American ($n = 2$), Hispanic ($n = 1$), Korean American ($n = 1$), mixed ($n = 4$), unknown ($n = 1$), and declined to state ($n = 1$). Psychiatric disabilities which students self-identified as were: bipolar disorder (BP, $n = 5$), post-traumatic stress disorder (PTSD, $n = 5$), depression ($n = 4$), anxiety or panic disorder ($n = 4$), borderline personality disorder (BPD, $n = 2$), obsessive-compulsive disorder (OCD, $n = 1$), agoraphobia ($n = 1$), psychotic disorder ($n = 1$) and schizoaffective disorder ($n = 1$); many of the participants ($n = 8$) had comorbidity for more than one psychiatric disabling condition. Students' major disciplines included: Psychology ($n = 4$), Ethnic Studies ($n = 2$), Biology ($n = 1$), Statistics ($n = 1$), Criminal Justice

Administration ($n = 1$), Hospitality and Tourism ($n = 1$), Human Development ($n = 1$), Communications ($n = 1$), Speech Pathology ($n = 1$), and Business Administration ($n = 1$). Table 1 lists each participant's pseudonym, and demographic information for multiple aspects of their identities (see Table 1).

Measures

The 13 interview questions focused on the challenges the students faced, the role of the disability in their experiences at the university, and the social support received from faculty or staff that facilitated a successful college experience. Examples of key open-ended questions from the semi-structured interview included: (1) What are the biggest challenges you face as a student with a disability, and (2) Do you feel that any one person or two has played the most important role in supporting your time as a student here?

Procedure

Participants were recruited through emails sent by Accessibility Services to students registered with disabilities and from a counselor to her advisees. Flyers were distributed to faculty mailboxes, and recruitment posters were posted on bulletin boards throughout campus. Respondents were screened to confirm their disability through the use of questionnaires; after being interviewed, each participant received $25 in funds applied to their university account, which could be spent on campus.

Each participant was interviewed once, either on campus ($n=11$) or over the phone ($n=3$). Interview lengths ranged from 20 to 80 minutes, with the average being 37 minutes. Each interview was audio recorded and then transcribed verbatim; the interview transcripts were read and re-read by the first author, making note of initial impressions. Themes were established based on the identification of participants' prevalent responses and on their particular salience to the overarching research question. As an iterative process, thematic analysis not only identifies and describes themes from the data collected, but also aims to "capture something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (Braun & Clarke, 2006, p. 82). The themes elicited from the data collectively address the question of how students with PD experience the university environment.

Results

The key themes elicited from analysis of the data include: (1) the effects of stigma on the university

experience, (2) the impact of the symptoms of PD on students in the university environment, (3) strategies for coping with the disability in the university environment, and (4) the role of social support from university faculty and staff (see Figure 1). It was through the individual and collective accountings of the day-to-day challenges and successes that the lived experiences of the participants were illuminated in greater detail.

The Effects of Stigma

Students with PD must often face the decision on whether or not to disclose their disabilities and to whom. The participants explained that the motivations behind their decision varied based on whom they were considering disclosing to, as well as the anticipated outcome. Not disclosing at the institutional level meant not receiving accommodations or needed support; however, not disclosing to classmates or professors had the social benefit of avoiding marginalization, labeling, or stigma. Navigating this tightrope of possible outcomes was described by participants as particularly stressful (see Figure 1).

All of the participants were students who had disclosed their disability status to the Office of Accessibility Services in order to receive accommodations; however, the decision on whether or not to disclose to faculty or classmates varied by student and was carefully considered. Nine of the fourteen participants chose not to disclose the specifics of their disability to anyone other than Accessibility Services counselors. Fearing stigma and embarrassment, being looked at and treated as different, and wanting to fit in were all contributors to their decisions, as was found in other studies (e.g., Sharpe et al., 2004; Thomson-Ebanks, 2014). Students or faculty not familiar with PD may readily dismiss or not be aware that this type of disorder has roots in genetic, environmental, and lifestyle factors and may be attributable to traumatic life events, biochemical processes in the brain, and/or environmental toxins (NAMI, 2018). The lack of awareness and/or sensitivity to the nature of these conditions was described as contributing to the student's sense of alienation and exclusion. Nine of the participants explained the impact of this external stigma and had developed strategies in the hopes of mitigating the impact.

> Raquel: It would help for other students to know kind of like what my disability is, just so they can understand, but then again I can be anxious because you don't know how they're going to react, but not only if they knew, but if they are understanding about it…people can be less under-

standing because they don't think it's as hindering as like dyslexia or something…just creating awareness so that I can be more comfortable to say something.

> Chris: Because you're first and foremost to people a person with a disability, so anything you say is invalid. But if you can succeed in passing [as someone without a disability] then your achievements have more merit because you're not a "person with disabilities" that has achieved these things, you're a "real" person that has achieved these things. Sometimes, if you can succeed in passing, it's just a lot easier.

When professors were described as being the source of stigmatization of students with PD, they were characterized as being judgmental, discriminatory, lacking compassion, being suspicious of students' need for accommodations, or acting dismissively toward the student and their concerns. A participant who received the accommodation of taking exams in a private room spoke about this as one of her biggest obstacles.

> Sharon: I'd say it's instructors who have a different sense of fairness…and so they somehow think that I'm getting an unfair advantage or that it's going to impact their ability to keep a fair testing environment for all, or that somehow there'll be cheating – that is the biggest obstacle and annoyance. And it is very discouraging because I encounter it every quarter.

Another student, describing the challenge of faculty who minimize the legitimacy of PD as a disability worthy of accommodations explained: "I've had teachers do that, like, 'it's all in your head,' and I wanna be like, well, why don't you go into my head… I've tried to figure out ways to make people understand."

Stigma not only originated from external sources; the effects of internal stigma, in which students felt negatively about themselves, were also reported as adversely affecting their experiences. Participants reported feeling embarrassed, rejected, having low self-esteem, lacking confidence, feeling different from their classmates, and not wanting to stand out in a negative way.

> Lisa: I feel kind of sad because I don't want to be different than my classmates and having special accommodations makes me feel like I'm different. I don't want to be and I don't want people to look at me like "oh, she has special accommodations, she must be having some troubles."

Numerous proposals for minimizing the stigma, both external and internal, were suggested by participants. One idea was to reframe the term "disabled" as "differently-abled," in order to alter both outer and inner perceptions of people with psychiatric disabilities. Other participants spoke of what they believed would be the benefits of awareness and education campaigns on campus to elicit greater understanding and sensitivity about PD, an idea supported by other researchers (Blacklock et al., 2003; Kiuhara & Huefner, 2008; NAMI, 2012). The advantage of a more seamless process for receiving accommodations without barriers was suggested by participants as a potentially significant contributor to minimizing stigma; one student described a wholly computerized process at her previous university which eliminated the need to present a paper accommodation letter in person, thus allowing for greater privacy and a less stigmatizing experience.

The Impact of the Symptoms

The impact that the symptoms of psychiatric disabilities have on a college student's academic performance, social interactions, and educational trajectory, as told by the participants, is powerful and complex. Students described significant obstacles they encountered as a result of their symptoms, which included: being unable to focus or concentrate, feeling overwhelmed, experiencing side-effects from medication, and being unable to complete their educational goals in a traditional timeframe. The symptoms themselves were described by some students and included experiencing blurry vision, racing heart, sweating, confusion, manic or depressed states, and impaired memory (see Figure 1).

> Sharon: For me, in particular, having a quiet place to take a test… I have a panic disorder and it's inconvenient most of the time, but super inconvenient when you're in a situation where, if you left, you can no longer get points and so…ah, I'm a straight-A student, but I will get an F on a test if I start to have a panic attack.

The effects of the symptoms were described by all of the respondents as challenging, though several explained that, with their medication regimen, they were able to manage the symptoms reasonably well. Students made it clear that their symptoms limited their capacity to function according to the same expectations of their non-challenged classmates and thus, all acknowledged that without accommodations they would not have been able to succeed at the university. Over half (n = 8) of the students had

comorbidity for multiple psychiatric disorders, presenting compounded challenges; while not unusual (e.g., Holmes & Silvestri, 2015), this highlights the necessity of implementing education and training for university faculty and staff as to the nature and multi-dimensionality of psychiatric disorders.

One of the most common conditions of the participants, bipolar disorder ($n = 5$), manifested as impaired focus, concentration, and cognition, causing significant challenges in everything from studying and completing homework to test-taking and making progress in educational goals. Experiencing erratic emotional, mental, and energy states, as well as inconsistent sleep cycles, meant that planning and completion of tasks were severely compromised. The symptoms themselves, as well as the limitations they created in performance, were a source of frustration for the students.

> Doris: Well, with being bipolar...what is difficult is being able to focus and see something all the way through because I get distracted and I also have these lulls where I don't produce anything.

A second prevalent condition of this group was post-traumatic stress disorder (PTSD) ($n = 5$). The symptoms of this disorder are reported as potentially affecting every aspect of a person's daily routine by the National Institute of Mental Health (NIMH, 2019). For these students, feelings of anxiety and sensory over-stimulation, inability to concentrate, hypervigilance, sleep-deprivation, and impaired comprehension contributed to creating obstacles to their success.

> Wes: Sometimes people don't realize the connection between those diagnoses [PTSD, Bipolar Disorder and Major Depression] and the challenge of learning…that it can interfere with the process…because my thoughts are not in a direct train, concentration can be a challenge and it takes extra energy to stay focused and to deal with the challenges of school itself that comes along with it – even something as simple as recording, listening and comprehending and remembering all at the same time can be a challenge some days.

Those participants with depression (n = 4) characterized their symptoms as feeling hopeless and sad, having no motivation, being apathetic and having a desire to quit school. They described feeling low self-esteem and a lack of self-confidence.

> Lisa: The problem is that sometimes I have too many things going on in my life, especially with

my family, and I'm feeling very, very down… I'm very responsible, I feel that I'm a good student, my GPA is 3.4, so I know that I have the potential…but when this depression comes to me, it's like I don't want to know about nothing, and even though I have to do my homework, I don't do it. Sometimes, I get so depressed I want to quit.

The remaining conditions reported by the study's participants (borderline personality disorder, obsessive-compulsive disorder, agoraphobia, psychotic disorder, and schizoaffective disorder) presented emotions and behavior which the students described as creating major challenges. Feeling extremely uncomfortable in the classroom, the emergence of unexpected behaviors, and the fear of being labelled and stigmatized were some of those challenges. Many of the symptoms experienced by the participants were moderated by medications; however, students explained that the medications themselves also created obstacles due to unwanted side-effects.

Strategies for Coping
In order to be successful in higher education, all students require coping skills and strategies to navigate the university environment; for students with psychiatric disabilities, this set of skills must be expanded to encompass the unique characteristics of their conditions. Whether challenged by impaired focus or concentration, feelings of anxiety that create blurred vision and impaired thinking, or internal/external stigma that creates feelings of low self-esteem or shame, participants described ways of coping that made their educational experiences more positive.

Coping strategies generally were described by participants as those of effectively managing their time, maintaining discipline, and not taking on too much at once; a unique perspective reported was one in which focus on grade outcomes was minimized in order to mitigate stress levels. Asking for help and seeking the assistance of professors outside of the classroom, though difficult for some, was described by over half of the participants as supporting their success while coping with their PD, as similarly noted in the literature (e.g., Collins & Mowbray, 2005; Dougherty et al., 1993). Citing limitations of the policies, practices, and training about PD within the university and its staff, half of the participants described that advocating for themselves, to the extent they were able, provided a way to influence more positive outcomes (see Figure 1).

The Role of Social Support from Faculty and Staff
Participants identified professors and counselors

as having had a significant impact on their educational experiences, in both positive and negative ways. When positive, they explained the benefits as being "transformational" and "wonderful." Professors were described as having provided support, understanding, and compassion, and filled roles not unlike those of parents, friends, or mentors.

Raquel: so like most of my professors have been understanding, but some have been more understanding than others. Kind of like…how that emotional connection is helpful because it's an emotional disability. And even if it's not [an emotional disability] there are feelings that go along with any disability. I feel like anybody can relate to feeling bad…feel frustrated when you can't get certain things. I just feel like making a connection with any disability is really helpful for the emotional side.

Counselors were described by the students as being sources of emotional support, guidance, motivation, and as go-betweens when students needed interventions on their behalf.

Doris: Ben Johnson [Accessibility Services counselor] has also given me, yeah, the support and just the positive input that I have value as a person because I don't always feel that way about myself.

Nine of the fourteen participants expressly cited specific staff counselors as being extremely beneficial in helping them navigate the campus environment more smoothly, several (*n* = 7) stating that these counselors went above and beyond their jobs at the university and provided supportive counsel on issues not only related to the university experience, but to their personal lives as well (see Figure 1).

Discussion

These study findings corroborate prior research on the obstacles faced and supports encountered by students with PD in postsecondary settings. The students described facing a multitude of obstacles in their attempts to navigate their environment in order to realize their educational goals; they expressed significant concerns about the capacity for these obstacles to negatively impact their experiences at the university. Components of their differing psychiatric disabilities were experienced as alterations in emotions, behavior, and cognition. Dealing with these fluctuating conditions presented often agonizing experiences for the participants, both internally felt as

well as creating negative responses in their social interactions at the university.

Nine out of the fourteen participants described negative experiences with professors and/or staff who demonstrated either blatantly discriminatory attitudes/behaviors, more subtle micro-aggressions, or a failure to provide the support the students were looking for. Yet, it is not the case that these students were blaming campus personnel for their difficulties. On the contrary, all of these same respondents described other interactions with professors and staff as caring and supportive, similar to other researchers' findings (e.g., Dougherty, 1993; Megivern et al., 2003; Schindler & Kientz, 2013). The students' characterization of the benefits of having an "emotional connection" with professors and staff provided a noteworthy perspective; because many students described fragile emotions as part of their condition, feeling emotional support and understanding was reported as having contributed positively to their educational experience. Generally speaking, student interactions with professors and staff that are encouraging have the potential to motivate students to persist in their studies (Schreiner, Noel, Anderson, & Cantwell, 2011; Trolian, Jach, Hanson, & Pascarella, 2016). Unfortunately, students with disabilities may be more vulnerable to being harmed by negative interactions with professors because they have been found to be more likely than nondisabled students to blame themselves for their failures (Adams & Proctor, 2010). Future research could explore the interactions between professors and students by contextualizing the faculty-student relationship to a greater extent, taking into account variables like academic field of the professor, major and educational level of the student, and whether or not there is a match between the professor and student in terms of gender, ethnicity, and other aspects of identity.

Limitations of the Study

Although the student experiences described here may have limited generalizability, the aim was to represent the campus environment as encountered by these students with PD, which may have applicability to similar environments. Due to the necessity of students identifying as having a psychiatric disability in order to participate, only students willing to self-disclose their condition participated; a broader narrative may have been elicited had the experiences of students with these psychological conditions, but who were not receiving accommodations, been represented in the sample. Further, the limitations of this study include the lack of more than one interview for each participant; however, while multiple interviews

might have elicited a greater level of comfort in the respondents, it's also possible that requiring additional interviews would have proven burdensome to some participants and yielded a less representative sample of participants with different types of disabilities.

Future Directions

Recommendations for Future Research

As with research on other types of disability, it is important that future research regarding students with psychiatric disability take into account the perspectives of the students themselves concerning what supports they are lacking in higher education, and why it's meaningful for them to remain steadfast in pursuit of their educational goals despite the hardships – in the words of Padron (2006), a "critical part of recovery is engaging in meaningful activities and having opportunities to learn and grow instead of being treated as a fragile, low functioning individual who is incapable of dealing with stress at any level" (p. 148). Students with psychiatric disabilities typically experience extended timeframes in their educational attainment (e.g., Knis-Matthews et al., 2007; McEwan & Downie, 2013; Schindler & Keintz, 2013), as did many of the participants in this study, with nearly all being over the age of 25 (average age 35.2 years). While symptoms related to their psychiatric disability may have caused students to take lighter course loads and/or to take breaks in their education, it is vital for future research to consider the complete life context of students with PD when making recommendations for facilitating their academic achievement. For example, in this study 10 of the 11 undergraduates were transfer students; academic advising for transfer students can be more complex, and being a transfer student can be a stigmatized aspect of a student's identity as well (Chin-Newman & Shaw, 2013). Additionally, older students are more likely to have children, and in this study 3 women were single mothers. Institutions of higher education could enhance the well-being of student-mothers by offering couples/family counseling, workshops on stress reduction and time management, and on-campus childcare (Miller, Gault, & Thorman, 2011; Quimby & O'Brien, 2006). Further research examining the specific concerns and needs of older students with PD would be an important contribution to the literature.

Due to the study's participants being mainly non-traditional aged students and because of their ethnic diversity (see Table 1), applying a lens of intersectionality may help in understanding their unique perspectives based on their personal identities (Stapleton & Croom, 2017). For example, an African

American man in his mid-40's was well aware that he didn't have demographic characteristics in common with his classmates, which made him feel "isolated." He described it as "extremely difficult" in "every class" to work with others in groups because of negative stereotypes others had of him based on his ethnicity; however, in order to overcome this, he worked extra hard to be helpful to classmates and initiate study groups. Multicultural educators suggest that teachers, even if they do not share the same aspects of identity as their students, can effectively employ culturally responsive pedagogy by learning about the history and culture of their students, being open to learning about people different from themselves, and recognizing ableism and other types of discrimination in others and in themselves (Grant & Zwier, 2011).

Intersectionality research in the future should begin to regularly include disability and ableism, while qualitative research on students with disabilities should regularly report on the ethnicity of participants and also analyze data with these aspects of the participants' identity in mind. For example, multiple qualitative studies of students with PD did not report on the ethnicity of participants (Demery et al., 2012; Dougherty et al., 1996; Knis-Matthews et al., 2007; Padron, 2006; Weiner, 1999), while two studies which reported enrolling numerous African American participants did not address this fact in discussion of their results (Megivern et al., 2003; Schindler & Kientz, 2013). Another aspect of identity that is often overlooked by researchers is the role of religion or spirituality (Grant & Zwier, 2011), which could play an important role in the lives of some students, such as African American students (Rosser-Mims, Palmer, & Harroff, 2014). In this study, two participants referred to religion or spirituality in their interviews; the male African American participant above referred to his belief in a higher power as giving him a sense of purpose, and a Korean American woman mentioned her Christian faith as helping her to focus on being the best student and parent that she can be.

Recommendations for Supporting Students with Psychiatric Disabilities

By making a greater investment in relevant programs and services, institutions of higher education could potentially do much to facilitate the success of students with psychiatric disabilities (Bazelon Center for Mental Health Law, 2007). The following recommendations address the need to create a campus climate that is welcoming to students with PD, and to coordinate services with outside mental health providers.

Fostering feelings of inclusion on campus for students with psychiatric disabilities. One of the key recommendations found in the literature and supported by this study is to develop services and programs to foster feelings of inclusion at the university for students with PD (Blacklock et al., 2003; Kiuhara & Huefner, 2008; NAMI, 2012). Achieving a sense of belonging and acceptance from those in one's environment is generally acknowledged as a basic human need (Baumeister & Leary, 1995; Maslow, 1968) that is related to persistence for college students (Tinto, 2017), and for students with mental health issues, it is an especially salient contributor to a positive experience in higher education (Knis-Matthews et al., 2007; Schindler & Kientz, 2013; Sharpe, et al., 2004). Two organizations that are working toward fostering awareness and inclusion of students with mental health conditions are Active Minds, and Art With Impact. Through student-run campus chapters, a speakers bureau, and other campus initiatives, Active Minds promotes dialogue on mental health issues with the goal of educating all students, eliminating stigma, and providing information about available mental health resources both on campus and within the community (Active Minds, 2019). Art With Impact promotes mental wellness through its "Movies for Mental Health" program by screening short films on campus in order to catalyze discussion of mental health issues (Art With Impact, 2019). Another approach would be to initiate a mental health awareness campaign on campus through ads in the campus newspaper, signs on campus, etc.; research on such a campaign in the community was found not only to improve knowledge of mental health issues, but to increase the likelihood that people would seek help (Wright, McGorry, Harris, Jorm, & Pennell, 2006).

Increased collaboration with community mental health providers. Another recommendation, supported by this study and others (Megivern et al., 2003; Wilson, Getzel, & Brown, 2000; Woodbridge, Goldweber, Yu, Golan, & Stein, 2014), calls for increased collaboration with community mental health providers. A study of all 23 California State University campuses and their local county mental health departments concluded that such partnerships yielded many advantages, including broadening awareness about available supports and increasing referrals to county mental health agencies (Woodbridge et al., 2014). Because supported education is usually available from off-campus providers, such referrals may be necessary in order for students with PD to access supported education (Collins & Mowbray, 2005). Additionally, the National Alliance on Mental Illness (NAMI, 2019) advocates for increasing the links between campus-based mental health services and community mental health networks, as

well as supporting legislation mandating increased funding for such measures.

Faculty and staff training related to understanding psychiatric disabilities. A third recommendation is for increased professional development and training of university faculty and staff pertaining to the issues relevant to students with psychiatric disability. As evidenced by the participants' reports of negative interactions with professors or staff, there is a notable deficiency in programs for educating faculty and the university community as to the nature of psychiatric disabilities, and the specific challenges and needs of this population. Survey research has also concluded that increased education is a necessary priority for addressing current inadequate or ineffective approaches (Collins & Mowbray, 2005; Martin, 2010). Faculty training offered by some pioneering institutions of higher education covers disability awareness, legal rights and responsibilities, and information about universal design for learning (Cook et al., 2006; Murray, Lombardi, Seely, & Gerdes, 2014; Park, Roberts, & Stodden, 2012; Sowers & Smith, 2004). Faculty members who have participated in such training indicate that their attitudes toward students with disabilities are more supportive, and that they are more willing to provide accommodations (Bigaj, Shaw, & McGuire, 1999; Murray, Lombardi, Wren, & Keys, 2009).

Because of the direct role of faculty members in teaching and advising students, as well as their potential influence on campus climate and culture, faculty members are key to the success of students with PD and other types of disabilities (Murray et al., 2014; Wilson, Getzel, & Brown, 2000). Ideally, a train-the-trainer model with faculty trainers could be effective for improving delivery of instruction and cultivating a culture on campus that is more supportive of students with disabilities (Rohland, Erickson, Mathews, Roush, Quinlan, & Smith, 2003). Although implementing such programs would require a substantial institutional commitment, campuses could take smaller steps toward increasing faculty members' understanding of students with disabilities, and universal design, by making available webinars (AHEAD, 2019; Innovative Educators, 2018) and online courses (Quality Matters, 2018), and publicizing online resources that are freely available (AUCD, 2019; CAST, 2019; Center on Disability Studies, 2019; DO-IT Center, 2019; Equity and Excellence in Higher Education, 2019). Further training for disability services staff in the areas of psychiatric disabilities and supported education would also be beneficial for students with PD (Collins & Mowbray, 2005); for example, any staff member could take a very low-cost online course on implementing mental health evidence-based practic-

es (Center on Mental Health Services Research and Policy, 2019), and those with prior work experience related to psychiatric rehabilitation are eligible to pursue certification as a Psychiatric Rehabilitation Practitioner (Psychiatric Rehabilitation Association, 2019). If institutions of higher education adopt multi-pronged approaches to increasing awareness of psychiatric disabilities and the legal responsibilities of faculty and staff related to PD, and motivate faculty members to incorporate principles of universal design into their instruction and to interact compassionately and appropriately with students with PD, the academic community can effectively engage, embrace, and support the educational goals of this population.

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Table 1

Participant Characteristics

Name	Age	Gender	Ethnicity	Education Level	Transfer Student	Psychiatric Disorder(s)	Major
Viola	40-50	Female	Declined to State	undergraduate	Yes	PTSD	Ethnic Studies
Kevin	26	Male	Mixed	graduate	N/A	Anxiety, Panic Attacks	Biology
Victoria	34	Female	White	undergraduate	Yes	Anxiety Disorder	Psychology
Raquel	19	Female	Samoan, Italian, Croatian, Chinese	undergraduate	No	Depression, PTSD, Borderline Personality	Psychology
Sharon	28	Female	Jewish	graduate	N/A	Agoraphobia, Panic Disorder	Statistics
Doris	64	Female	Unknown	undergraduate	Yes	Depression, Bipolar Disorder, PTSD, Anxiety	Ethnic Studies
Wes	45	Male	African American	undergraduate	Yes	PTSD, Bipolar Disorder, Major Depression	Psychology
Lisa	42	Female	Hispanic	undergraduate	Yes	Severe Depression, Borderline Personality Disorder	Criminal Justice Administration
Cindy	31-36	Female	Korean American	undergraduate	Yes	Bipolar 1 Disorder	Hospitality and Tourism
Latifa	45	Female	African American	undergraduate	Yes	ADHD, Obsessive-Compulsive Disorder	Human Development
Caroline	32	Female	White	undergraduate	Yes	PTSD	Psychology
Chris	26	Male	White	undergraduate	Yes	Bipolar NOS, ADHD, ASD	Communication
Neil	27	Male	Latino / White	graduate	Yes	ADD, Bipolar 1 Disorder	Speech Pathology
John	26	Male	African American-Caucasian	undergraduate	Yes	Psychotic Disorder, Schizoaffective Disorder	Business Administration

Note. PTSD = Post-traumatic Stress Disorder; ADHD = Attention Deficit Hyperactivity Disorder; NOS = Not Otherwise Specified; ASD = Autism Spectrum Disorder; ADD = Attention Deficit Disorder
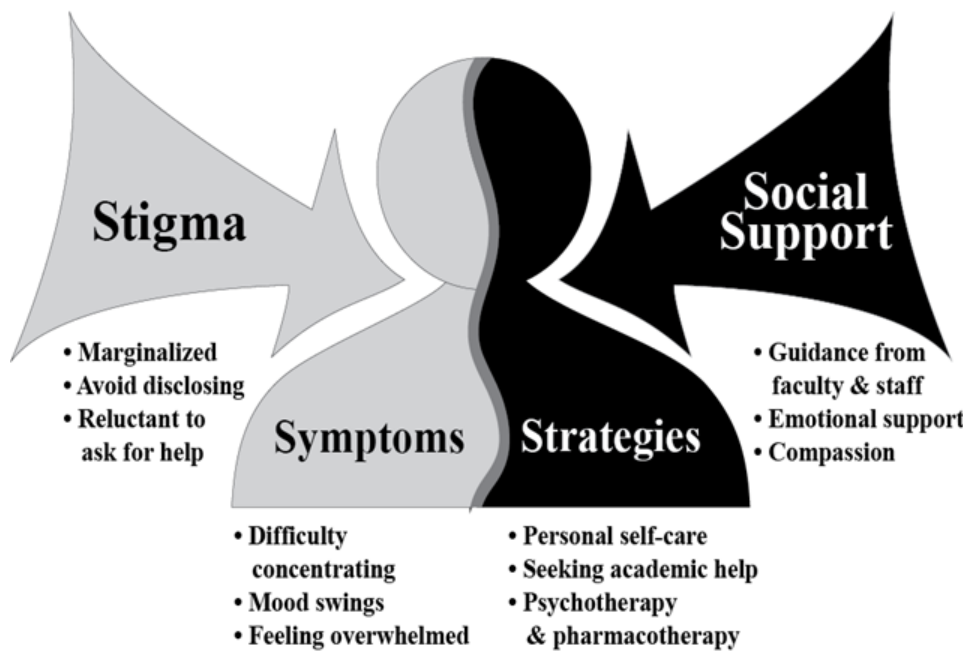
Figure 1. Challenges and supports for university students with psychiatric disabilities. Image adapted from original with permission by Livier Ayon, 2016.

A Review of the Literature on Postsecondary Education for Students with Intellectual Disability 2010-2016: Examining the Influence of Federal Funding and Alignment with Research in Disability and Postsecondary Education

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Abstract

Amendments to the Higher Education Opportunity Act (2008), including the creation of the Transition and Postsecondary Program for Students with Intellectual Disabilities (TPSID) model demonstration program, have led to increased opportunities for students with intellectual disability to obtain postsecondary education. The present study builds on previous reviews of the literature on postsecondary education (PSE) for students with intellectual disability (SWID) to provide a review of articles published in peer-reviewed journals between 2010 and 2016. The specific aims were to (a) describe recent research, (b) determine the impact of TPSID funding on peer-reviewed literature, and (c) compare the domains and methodologies used with research on PSE for students with disabilities in general using the Postsecondary Access and Student Success (PASS) taxonomy (Dukes, Madaus, Faggella-Luby, Lombardi, & Gelbar, 2017). Findings are described and implications for research and practice are discussed.

Keywords: postsecondary education, higher education, intellectual disability, college students with disabilities

In recent years, there has been tremendous increase in the opportunities for students with intellectual disability (SWID) to pursue postsecondary education (PSE). Amendments in the Higher Education Opportunity Act (HEOA, 2008) created pathways to federal financial aid for SWID and a new model demonstration program: Transition and Postsecondary Programs for Students with Intellectual Disabilities (TPSID). These initiatives and financial investments brought greater attention to the need for expansion of PSE options for SWID. Subsequently, the prevalence of college and university programs enrolling SWID has grown significantly in a relatively short period of time. Although existing federal higher education datasets do not gather or share program information regarding SWID, a directory of self-reported data from programs is managed and updated by Think College at the University of Massachusetts Boston. This directory shows the number of PSE programs for SWID grew from 148 in 2008 (Grigal, Hart, & Weir, 2012) to 280 as of November 2019 (Think College, 2019), an almost 90% increase in a little over a decade.

The increases in postsecondary options and student enrollment have presented new opportunities for gathering data on student experiences and program outcomes. In particular, the creation of the TPSID programs, and the evaluation activities conducted by the corresponding National Coordinating Center, led to the creation of the first national longitudinal dataset on postsecondary education for students with intellectual disability (PSEID). Funded by the U.S. Department of Education, Office of Postsecondary Education, TPSID grants were awarded to two and four-year colleges and universities to create or expand high quality, inclusive model comprehensive transition and postsecondary education programs for students with intellectual disabilities. The first cohort of 27 grantees in 23 states received five-year awards in 2010 and another cohort of 25 grantees were awarded TPSID grants in 19 states in 2015 (National Coordinating Center Accreditation Workgroup, 2016). The National Coordinating Center for the TPSID model demonstration program was established by Think College at the Institute for Community Inclusion, University of Massachusetts Boston in 2010.

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The development, implementation, and evaluation of the TPSID model demonstration project also led to increased awareness and support for expansion of programs at colleges and universities both within and outside of the TPSID network (Grigal, Hart, Smith, Domin, & Weir, 2016). It also generated increased opportunities for research to be conducted on the provision of inclusive higher education, the perceptions and experiences of various stakeholders, as well as the associated outcomes. This recent surge in research is not evident in previous reviews of the literature on PSEID conducted by Neubert, Moon, Grigal, and Redd in 2001 and by Thoma, Lakin, Carlson, Domzal, Austin, and Boyd in 2011.

Neubert et al. (2001) examined peer-reviewed literature from 1966 to 2000 locating 27 published articles, of which 23 were specific to the U.S. The majority were program descriptions or position papers advocating for the inclusion of individuals with intellectual disability in postsecondary education. The authors identified a trend from more segregated programs on college campuses in the 1970s and 1980s with little opportunity for integration with typical college peers to an increased focus in the 1990s on inclusion in college classes and the emergence of dual enrollment for SWID in their last few years of high school. Limited empirical research was found and shared. In 2011, Thoma et al. provided an updated review of literature published between 2001 to 2010. The authors located 24 peer-reviewed articles in the U.S. (this review also included dissertations). Similar to Neubert et al., findings, the majority of articles were program descriptions, although greater program specific details were provided including program development strategies. Other studies identified national trends or explored the perspectives of students, parents, faculty, and program developers. In both literature reviews, the authors pointed to a large number of questions to be examined in future research and called for research on the outcomes of SWID attending PSE as well as identification of "what works" to prepare college SWID for successful outcomes.

Since the publication of these literature reviews, there have been substantial contributions to the peer-reviewed literature on PSEID, in large part due to the guidance and investments resulting from the reauthorization of the HEOA (2008) and the advent of the TPSID model demonstration program. Though the TPSID model demonstration program was not characterized as a research initiative, it was charged with establishing an evidence-base for PSE practices. As such, many articles on PSEID have been published in peer-reviewed literature since the inception of the TPSID program. An updated literature review reflect-

ing these recent contributions is needed to ascertain if, and how, the expansion of PSEID services after 2010, and funding provided by the TPSID program have impacted the nature of existing PSEID research.

Another recent development in the field of PSE research is an effort to develop a taxonomy to organize and examine the extant research on students with disabilities in higher education writ large. The Postsecondary Access and Student Success (PASS) taxonomy for PSE and students with disabilities (Dukes, Madaus, Faggella-Luby, Lombardi, & Gelbar, 2017) was developed through extensive literature mapping and expert input. The taxonomy has a four-domain structure with corresponding subdomains. After developing this taxonomy and corresponding subdomains, Madaus et al. (2016) used it to analyze 1036 articles published on PSE for students with disabilities (PSED) between 1980-2012 to ascertain which domain and subdomain they ascribed. These researchers found 97.8% of the articles reviewed fit into the taxonomy. However, it should be noted articles about non-matriculated students were omitted from the sample. This could indicate much of the research on PSEID was not included in this review as SWID are not typically matriculating in PSE.

Given the new level of program availability and research activity, as well as an emerging research classification structure, an updated literature review reflecting these recent contributions was conducted to include all peer-reviewed literature (including research, program, and policy) since 2010. The scope of the review aligned with the commencement of the TPSID model demonstration program and its completion in 2016, at the end of the no-cost extension year for the TPSID grantees funded in the first cohort. The review had three specific purposes:

1. Describe peer-reviewed literature on PSEID from 2010 to 2016 reflecting on the journals in which work was published, the settings examined, the purposes stated, and the specific methodologies (participants, data collection, design) used.
2. Determine the impact of federal funding via the TPSID and other programs on peer-reviewed literature on PSEID.
3. Compare the domains and methodologies used in peer-reviewed literature on PSEID with those present in literature on PSED using the PASS taxonomy for PSE and students with disabilities (Dukes et al., 2017) to determine similarities and differences in these fields of research.

Method

We conducted a search of online databases Academic Search Premier and ERIC using combinations of the search terms: (1) intellectual, developmental, cognitive, significant, or severe disability or disabilities or mental retardation; and (2) college, university, or postsecondary or higher education. To be included in the review, articles needed to be (1) published in a peer-reviewed journal between 2010 and 2016, (2) focus on students with ID or ID plus other disabilities, and (3) focus on higher education or dual enrollment (a practice used to support high school students with intellectual disability typically between the ages of 18-22 to access college as a transition experience during their final years of special education services). Articles were excluded if they (1) were published prior to 2010 ($n = 36$) or after 2016 ($n = 21$ to date); (2) were published in a format other than a peer-reviewed journal, for example dissertations ($n = 20$ since 2010), books or book chapters ($n = 3$ since 2010), or other non-peer-reviewed source ($n = 92$ since 2010); (3) conducted an intervention study with college SWID as a convenient sample but did not focus on any aspect specific to including SWID in PSE ($n = 13$ since 2010); (4) were a descriptive article that mentioned PSE for SWID but these students were not a primary focus of the article ($n = 2$ since 2010); or (5) conducted an analysis of secondary data with results that included PSEID but SWID were not a primary focus of the analysis ($n = 1$ since 2010). The final sample consisted of 60 articles.

Coding of the articles began with development of a data collection form and initial pilot of the form by the authors using five articles. The authors coded articles independently and then compared the results. Categories were added, and wording edited to ensure clarity and consistency in coding. Once the data collection form was finalized, the first author coded each of the articles and then interrater agreement was conducted by both authors on 30% of the articles. Disagreements were resolved through discussion between the two authors, resulting in 100% agreement. Articles were coded on more than 40 variables grouped by the three purposes of the review. Data were collected using an online form through Google Forms developed for the present study. Records were downloaded and analyzed in Microsoft Excel.

For purpose one, descriptive information including the year, authors, journal, and purpose was coded for all articles. Program characteristics were coded for any article that provided a program description. These characteristics consisted of the name, location, and type of college or university; type of students served; program length; and program components (inclusive academic coursework, specialized coursework, employment opportunities, housing, and credential). Locations were grouped together using the U.S. Census Bureau Regions (West, Midwest, Northeast, and South). For articles that conducted a research study (all articles that collected original data as well as two additional studies that analyzed secondary data), research methods including the sample, data collection methods, and design were coded.

For purpose two, any funding that supported the research study or program was coded. TPSID funding was determined as funding received by the U.S. Department of Education, Office of Postsecondary Education. Author affiliations were coded and compared with a list of TPSID Cohort One grantees on the Think College website (see https://thinkcollege.net/tpsid).

For purpose three, the PASS taxonomy (Dukes et al., 2017) was used to code the domain and subdomain of each article. This taxonomy addresses the following four domains and corresponding subdomains: student-focused support, program and institutional-focused support, faculty and staff-focused support, and concept and systems development (see Table 4 for domain descriptions and corresponding subdomains). To allow further comparison with the broader literature base on PSE for students with disabilities, articles were coded as containing original or nonoriginal data as well as the type of methodology used, with the same coding definitions as those provided by Madaus et al. (2016). Original data was defined as survey, measurement, evaluation, observational, or interview data. Both secondary analysis of larger datasets as well as simple program descriptions were not considered original data. If the article collected original data, the methodology used was coded as descriptive quantitative, qualitative, mixed methods, group design, or single subject design.

Results

Purpose One: Describe Published Articles

Journal. Table 1 displays the number of articles in each of the journals in which articles were published. Of the 60 peer-reviewed articles, the greatest number were published in the *Journal of Postsecondary Education and Disability* ($n = 11$, 18.3%), followed by the *Journal of Policy and Practice in Intellectual Disabilities* ($n = 7$, 11.7%), the *Journal of Vocational Rehabilitation* ($n = 5$, 8.3%), and *Inclusion* ($n = 4$, 6.7%). A substantial number ($n = 16$, 26.7%) were published in journals other than those listed in Table 1 (see note).

Setting. Components of higher education programs were described in 35 articles. The majority of all programs described were at four-year (82.9%) and public (62.9%) IHEs. Programs located in the south were described in the highest number of articles (60%, vs. Midwest 22.9%, West 8.6%, and Northeast 5.7%). The most frequently stated program length was two years (40%). The program name was stated in slightly less than half of all articles (45.7%). In terms of the type of students served (adult vs. high school), 8.6% of articles stated the program served dually enrolled students, 14.2% served only adults, and 8.6% served both; this information was missing in more than two-thirds of articles (68.6%). In terms of program components, 77.1% stated the program included inclusive academics, 31.4% stated the program included specialized coursework, 57.1% stated the program included employment opportunities, 40% stated the program provided housing, and 31.4% stated the program offered a credential. Only five articles (14.3%) provided a description of the program that addressed all five of these components. Only two articles (5.7%) described all of the above program variables that were coded.

Purpose. The stated purpose of each article was coded, and common purposes were grouped together in categories (see Table 2). The most frequent purposes were to evaluate the perspectives of stakeholders ($n = 22$) or describe a particular PSE program for SWID ($n = 14$).

Methods. In addition to the 40 studies that collected original data, two studies analyzed only secondary data. Therefore, methods for 42 research studies were coded. Secondary data sources were analyzed in four studies altogether and consisted of the NLTS2 dataset, the RSA-911 dataset, the National Core Indicators Adult Consumer Survey (NCI ACS), and existing student journals from a class. In surveys of the characteristics of PSE programs ($n = 8$), the Think College database was used to identify sites in 7 (87.5%) studies.

The most frequent type of participant was SWID ($n = 20$), followed by program staff ($n = 10$), students with other disabilities ($n = 10$), and students without disabilities (i.e., typical college population; $n = 9$). Of the studies that included SWID as participants, 10 studies had a sample size of between one and 10 students. Four studies had a sample size of 11-20 SWID and an additional two studies had a sample size in this range but did not specify how many of the participants had intellectual disability. Three studies had larger sample sizes ($n = 21$, Moore & Schelling, 2015; $n = 125$, Ross, Marcel, Williams, & Carlson, 2013; and $n = 17,478$, Grigal, Migliore, & Hart, 2014). The remaining study did not specify the number of participants with intellectual disability. Of the 20 studies that included SWID as participants, 10 included students with other disabilities (not including peer mentors/tutors) in the sample. These included students with ASD ($n = 6$), students with disabilities other than ID or ASD ($n = 3$ studies), and students with intellectual or developmental disabilities (i.e., the number with intellectual disability was not specifically stated, $n = 1$). Across the 20 studies that included SWID as participants, 15 collected data while students were enrolled in postsecondary education, 4 studies collected data after students exited postsecondary education, and 1 study collected data when individuals exited the VR system. Only one study reported on the outcomes of students who attended PSE across multiple sites (two sites; Moore & Schelling, 2015).

Data collection methods and design are shown in Table 3. The most frequently used data collection method was a survey or questionnaire ($n = 26$; 61.9% of research studies). Description of quantitative data was the most common design ($n = 28$; 66.7% of research studies), although a substantial number of research studies used qualitative design ($n = 17$; 40.5%).

Purpose Two: Determine Impact of Federal Funding on Research

Twenty-five articles reported a funding source (41.7%). Six articles reported more than one funding source, for a total of 32 funding sources. The most frequent source of funding was the U.S. Department of Education, Office of Postsecondary Education ($n = 14$). Studies were also funded by the U.S. Department of Health and Human Services, Administration on Intellectual and Developmental Disabilities ($n = 5$); the National Institute on Disability and Rehabilitation Research ($n = 4$); the U.S. Department of Education with no office specified ($n = 2$); as well as other sources including foundation funds ($n = 7$). The majority of funding sources were federal funds (27 of the 32 funding sources). To further evaluate the impact of TPSID funds, the affiliations of authors were compared to the list of TPSID Cohort One sites. For 41 studies (67.2%), at least one author was affiliated with a site that received TPSID Cohort One funds.

Purpose Three: Compare PSEID and PSED Research

Across the 60 articles in the review, most articles were in the domains of program and institutional-focused support ($n = 23$, 37.7%) or student-focused support ($n = 17$, 27.9%). Fewer articles were in the domains of faculty and staff-focused support ($n = 2$, 3.3%), and concept and systems development ($n = 9$,

14.8%). See Table 4 for the number of articles coded in each subdomain. Ten articles did not fit in any domain (16.4%). Of all articles included in the review, 40 (66.7%) presented original data and 20 (33.3%) did not present original data. The methodologies used were: descriptive quantitative (*n* = 22, 55%), qualitative (*n* = 10, 25%), mixed methods (*n* = 5, 12.5%), and single subject (*n* = 3, 7.5%).

Program and institutional-focused support domain. More than one third of the articles (*n* = 23) were in the program and institutional support domain. Within this domain, most articles (*n* = 13) fit within the "general or specific descriptions of disability programs or components" subdomain. These articles included both descriptions of a particular program for SWID (e.g., Kelley & Westling, 2013; Rogan, Updike, Chesterfield, & Savage, 2014) as well as descriptions of programs nationwide with information gathered through a survey (e.g., Grigal et al., 2012; Papay & Bambara, 2011). Other articles in this domain focused on program development (e.g., Papay & Griffin, 2013; Plotner & Marshall, 2015); experiences, perceptions, knowledge, attitudes, or beliefs of peer mentors (e.g., Culnane, Eisenman, & Murphy, 2016); program evaluation (e.g., Lynch & Getzel, 2013; Ryan, 2014); and institutional policies/procedures (e.g., Westling, Kelley, & Prohn, 2016). Of the 23 articles in this domain, only 13 analyzed original data, indicating a high degree of general descriptive articles in this domain.

Student-focused support domain. Within the student-focused support domain, all articles either collected original data or conducted a secondary analysis of existing data, indicating a strong focus on data-based articles within this domain. Almost half of the articles (*n* = 7) were in the "experiences, perceptions, knowledge, attitudes, or beliefs of students with disabilities" subdomain. Five of these articles were qualitative studies of the experiences or perceptions of SWID and the remaining two articles used descriptive quantitative methods. Three articles in this domain fit in the "post-undergraduate program experiences and/or outcomes" subdomain (Butler, Sheppard-Jones, Whaley, Harrison, & Osness, 2016; Moore & Schelling, 2015; Ross et al., 2013). Although sample sizes were small for all three studies, SWID who attended PSE were reported to experience favorable outcomes in terms of employment, health, and independent living.

Two studies fit into the subdomain of "learning/using study skills, learning strategies." These were intervention studies that taught note-taking skills (Reed, Hallett, & Rimel, 2016) and collateral academic skills (Chezan, Drasgow, & Marshall, 2012),

both with positive findings. The remaining five articles did not fit into any subdomain. These were a study on the development and use of a social network instrument (Eisenman, Farley-Ripple, Culnane, & Freedman, 2013), an intervention for teaching requesting and using accommodations (Mazzotti, Kelley, & Coco, 2015), an intervention for supporting task engagement and social interactions in internships (Gilson & Carter, 2016), a qualitative study of students' perspectives on self-determination (Ankeny & Lehmann, 2011), and vocational rehabilitation (VR) data on the participation of SWID in higher education (Grigal et al., 2014).

Faculty and staff-focused support. Only two articles aligned with the faculty and staff focused support domain and both addressed the "faculty knowledge, attitudes, and beliefs" subdomain. Gibbons, Cihak, Mynatt, and Wilhoit, (2015) and Jones, Harrison, Harp, and Sheppard-Jones (2016) both conducted surveys at single institutions of higher education in the southeastern U.S. and collected original data. Gibbons et al. surveyed university faculty and students about their beliefs related to PSEID and autism. Results highlight a willingness to embrace these programs but with faculty showing greater concerns about the effects in the classroom and the potential negative impact on peers. Faculty participants indicated more uncertainty about inclusion of SWID than did students. Jones et al. found faculty who had experience with PSEID perceived both personal and professional growth for students and instructors, including academic gains, social gains, and personal gains. Identified barriers included the challenges of academic rigor and issues related to communication.

Concept and systems development. Nine articles fit into the concept and systems develop domain. Two ascribed to the evaluation metrics and methods subdomain; Grigal, Dwyre, Emmett, and Emmett (2012) focused on the development of an evaluation tool for dual enrollment PSE programs and McEathron, Beuhring, Maynard, and Mavis (2013) focused on developing a taxonomy for PSE programs. A single article, Hosp, Hensley, Huddie and Ford (2014) aligned with the subdomain of assessment instruments. This study determined the criterion-related validity for using curriculum-based measurement for PSE for students with ID. The majority of the articles (*n* = 6) were in the subdomain "conceptual models or discussion of issues in disability services" and did not present original data.

Discussion

Describing Recent PSEID Research

Legislation and subsequent federal funding in recent years have led to increased opportunities for individuals with intellectual disability to obtain post-secondary education. This increase in program development and access have been paralleled in a growing body of research. From 2010 to 2016, there were 60 articles published in peer-reviewed journals, an average of 8.6 studies per year. In comparison, 24 articles (including dissertations) were included in a decade long review (2001-2010) conducted by Thoma et al. (2011), an average of 2.4 studies per year. Although this 150% increase is striking, the average number of studies still does not come close to paralleling the number of studies published in the literature on PSED which averaged 61.5 per year over the most recent period reviewed (2007-2012; Madaus et al., 2016). Therefore, research on PSE for SWID constitutes a growing, but still relatively small, portion of all research on PSE for students with disabilities.

Articles in the present review were distributed across 28 journals, suggesting this type of research has more than one "home." A similar finding was reported by Madaus et al. (2016) in their review of literature on PSE for students with disabilities in general. Madaus et al. state the breadth of journals in which research is published:

> presents both challenges and opportunities for higher education. It is at first a challenge as the breadth of journals may obfuscate critical trends in higher education and disability by scattering related findings about common problems across multiple constituencies. Further, the breadth of journals means that there are no common research guidelines applied consistently throughout the research literature, thus weakening the ability to cogently inform the field of new and critical findings. Yet there is also opportunity, as the literature clearly reflects multidisciplinary interest, thus providing a broader lens to examine important topics. (p. 7)

These comments on the challenge and opportunity certainly apply to research on PSEID as well. Of particular note is the majority of journals in which articles were published were disability- or special education-focused and few studies were published in higher education-focused journals. Greater attention to and inclusion of studies on PSEID in higher education literature would offer an audience of higher education researchers an opportunity to learn about the nature, structure and outcomes of these programs. It may also lead members of the higher education community to reflect on how the inclusion of students with ID in their respective colleges and universities might impact their future research and practice. However, the lack of publications in mainstream higher education journals may not reflect a lack of interest or effort on the part of researchers. It is possible that disability-focused research is not as welcomed or successful in getting published in higher education journals due to decisions made by editorial staff or review determinations made by field editors. If these individuals do not value research on students with disabilities or feel it would not be of interest to their readership, then more than likely studies focusing on disability issues will likely remain unpublished in higher education journals.

Determining Impact of TPSID Funding

The present review found an increase in the volume of articles published in peer-reviewed journals since TPSID funding began in 2010. The review also found a substantial number of articles – two thirds – had at least one author who was affiliated with a site that received TPSID Cohort One funding. The TPSID program also seemed to influence the region in which the preponderance of the research was conducted, the southeastern region of the US. Twenty-one (60%) of the studies reviewed were conducted in the south. The Midwest produced 23%, while the northeast and western states both offered less than 10%. These figures ascribe to the receipt of TPSID grants – one third of the TPSID Cohort One grantees were located in the southern region – and states such as North Carolina, Tennessee, South Carolina and Georgia have strong regional coordination.

Additionally, the most frequently cited funding source was the U.S. Department of Education, Office of Postsecondary Education, the source of TPSID funding. It is clear the TPSID model demonstration program, either directly through increased staffing or indirectly through increased attention or desire to seek evidence-based practice, has benefitted the field of PSEID in terms of research as well as practice.

Comparing PSEID Research to PSED

In the review conducted by Madaus et al. (2016) of literature on PSE for students with disabilities, 42.4% of articles were student-focused support, 29% were program and institutional-focused support, 13.4% were faculty and staff-focused support, and 13.3% were concept and systems development. The present review found in the recent body of research on PSEID, there are more studies on program and

institutional-level support (37.7%) and fewer on student-focused support (27.9%) than PSED literature. One potential explanation for the greater attention given to programs and institutions in the literature on PSEID is this newly developed field required a paradigm shift for SWID to obtain postsecondary education, necessitating descriptions of programs and guidance on program development.

Another potential explanation is the higher percentage of research on student-focused support in the Madaus et al. (2016) review is because this domain includes the practice of accessing the disability services office. Students with disabilities access this office as their primary means of obtaining academic accommodations or needed supports for course or campus access, therefore it is logical that there is a strong emphasis on this practice in PSED research. However, students with ID have not utilized the disability services office as consistently as have other students with other disability (Grigal et al., 2016). And while the leading professional organization for disability support professionals, the Association of Higher Education and Disability (AHEAD) has offered guidance about how disability services offices should serve students with ID (Thompson, Weir, & Ashmore, 2011), it is incumbent on disability services office personnel to educate themselves about their role in supporting programs and providing services to SWID.

PSEID outliers from the PASS taxonomy. There were 10 articles (16.4%) on PSEID that did not fit into the existing PASS taxonomy. The bulk of these reflected perspectives of stakeholders may not be as prevalent in research in higher education on students with other kinds of disability. Supports for college SWID may stem from peers, from their school system (if dually enrolled), and from parents or adult service providers. The complex nature of the support systems involved with college access for SWID may be the reason a number of articles did not fit the PASS taxonomy. SWID, even those attending college, may still be more reliant on their parents than other college students with or without disability. They may also be involved with other agencies due to needed supports or benefits associated with their disability such as VR, Social Security, or Medicaid. The 10 articles that did not fit into one of the four domains primarily focused on perspectives of stakeholder groups including adult service providers (Sheppard-Jones, Kleinberg, Druckemiller, & Ray, 2015), parent/family members (Griffin, McMillan, & Hodapp, 2010; Martinez, Conroy, & Cerreto, 2012); college students (Griffin, Summer, McMillan, Day, & Hodapp, 2012; Izzo & Shuman, 2013; May, 2012; & Westling, Kelley, Cain, & Prohn, 2013).

The remaining two articles focused on statewide development (Mock & Love, 2012; Smith & Benito 2013). The emergent nature of the field of inclusive higher education and the need for policy development and alignment of the aforementioned state and local systems also may be a more disability-specific dynamic associated with college SWID.

It could be as PSE options expand and access to existing supports via disability services offices become more prevalent for students with ID, the proportion of research in higher education that focuses on student supports may grow. However, the exclusion of literature reflective of issues relevant to the ID population such as peer supports, adult service provider roles, and family needs is worth considering as the PASS taxonomy is refined. Future modifications should ensure the taxonomy addresses research on all students with disability, including research on stakeholder groups specific to SWID. This may help to prevent exclusion of important studies from the canon of PSE literature on disability. However, for the purposes of this study there was enough similarity in the two bodies of literature that the PASS taxonomy could be applied to more than 80% of the articles.

Research base similarities. There were similar percentages of studies in the present review that used original data compared to the Madaus et al. (2016) review. Two-thirds of the present studies used original data compared to approximately 60% of the articles reviewed by Madaus et al. Further, there was a very high degree of similarity in methodologies used compared to literature reviewed by Madaus et al. The methodologies of studies in the review by Madaus et al. were: descriptive quantitative 55%, qualitative 29%, mixed methods 10.1%, and group or single subject 6%. This could be interpreted as an encouraging finding, suggesting methodologies used in studies on PSEID parallel those used in studies on PSED. However, both fields of study demonstrate a need for more rigorous empirical studies. Without this, "the field may be at risk of disseminating and potentially endorsing myths of practice that are at best ineffective and at worst, harmful for students" (Madaus et al., 2016, p. 9).

Limitations

As with any literature review, the present review has a number of limitations. First, it is possible studies were missed in the keyword search. Within this particular field, there have been many terms used to describe PSE (e.g., postsecondary education, higher education, college/university, inclusive higher education, dual enrollment transition program, etc.) as well

as many terms used to describe SWID (including intellectual and developmental disabilities, cognitive disabilities, significant disabilities, severe disabilities, etc.).

Second, it is likely more studies from TPSID Cohort One than those identified in this review will be published, given the length of time it takes to prepare and publish research findings. Therefore, it is possible studies supported by TPSID Cohort One funding were missed by the timeframe for this review.

Third, the information provided in published articles is not sufficient to determine whether authors were directly associated with TPSID funds. It is possible authors may have been at sites that received TPSID funding but the authors themselves were unconnected with the TPSID grant.

Fourth, the present review excluded 20 dissertation studies published between 2010 and 2016. Anecdotally, we noticed many of the dissertation studies employed more rigorous quantitative and qualitative methodologies than articles published in peer-reviewed journals. The findings of dissertation studies will be examined in a future review, although we encourage the authors of these valuable dissertation studies to publish their findings in peer-reviewed journals in order to reach a wider audience.

Fifth, 13 studies were excluded that examined the impact of an intervention with postsecondary SWID but did not specifically focus on access or success in postsecondary education. These studies used either single subject or group research designs with small numbers of participants to study interventions for academic skills such as reading comprehension or vocabulary acquisition or the use of assistive technology for skills such as navigation or time management and specifically stated that the purpose of the study was to examine the impact of the intervention. Such studies were excluded to ensure the studies reviewed focused on access to PSEID and studies that involved SWID as a sample of convenience to examine the impact of an intervention were excluded. However, research examining the impact of an intervention with SWID in PSE does appear to be a growing area of research. Future reviews should take a closer look at these studies and make recommendations regarding the participation of postsecondary SWID in research.

Sixth, Madaus et al. (2016) reviewed studies from 1955 to 2012 and the most recent period available for comparison with the present studies was 2007 to 2012. Further, the review by Madaus et al. (2016) also included studies from outside of the U.S. A comparison of studies during the same time period as those selected for this review (2010 to 2016) and only in the U.S. could have yielded slightly different findings.

Finally, we did not attempt to code the results of studies due to the high degree of variability in purpose, participants, and methods. Therefore, a review of the findings of recent research remains to be conducted. Despite these limitations, the present review has many implications for research and practice.

Implications for Research

A primary implication of this review is the need for more empirical research documenting the outcomes of SWID in PSE, involving greater numbers of SWID across multiple sites. Results from outcome studies may improve our knowledge of the efficacy of certain PSEID practices, and the impact on various types of outcomes including employment, independent living, social networks, and fiscal independence. Longitudinal follow up studies could reflect important changes in graduate outcomes over time, as the impact of college experiences are not always immediate. Only four studies in the review reported data after students exited PSE and only one study reported on the outcomes of students who attended PSE across multiple sites. Studies that included SWID as participants had relatively small sample sizes – half of these studies had a sample size of 10 students or fewer and only three studies had greater than 20 participants with ID.

Unlike the previous reviews by Neubert et al. and Thoma et al., the current review benefited from a field far more developed in terms of legislative guidance and level of implementation. Although the quantity of publications has expanded, the nature of its content is not substantially dissimilar to the literature examined in 2011 by Thoma et al.

Research on PSEID has, for many years now, been describing "what is" and must now progress to exploring "what works", and then "what works with whom." Despite numerous calls for research on outcomes and the impact of PSE practices on outcomes for students with intellectual disability (Grigal, Hart, & Weir, 2013; Neubert et al., 2001; Thoma et al., 2011), the field has been slow to engage in this research. This could be due to a lack of funding for research in PSEID, and in particular funding for the collection of data for program completers. Outcome data on students who attended TPSID programs funded between 2010-2015 was not required by the federal office funding the program. Further, the collection of these data was prohibited from being included in the reporting protocol implemented by the National Coordinating Center (Grigal et al., 2016). Thus, outcome data from the over 2,200 students served by this program were not captured during the 2010-2015 funding cycle. It is critical future research examine student outcome data.

Second, there is a need for better descriptions of program context in future published journal articles. There is a high degree of variability in the models used to support SWID to access PSE as well as variability in the types of students served. The practices used in one context may not be as effective in another. Therefore, it is essential for researchers to provide a description of the broader program in which research is situated, not just the immediate setting in which a research study occurs. We suggest, at a minimum, program descriptions contain:

- type and location of institution,
- name of program (unless anonymity is a concern),
- length of program,
- type of students served, and
- basic program components (i.e., the presence or absence of inclusive classes, specialized classes, employment opportunities, housing, and credential).

In terms of describing student participants, we recommend researchers describe the disabilities of participants, including how many students had ID, had autism (but not an ID) or autism and an ID, as well as any particular criteria used for admitting students into the PSE program (e.g., academic skills, functional abilities, safety or life skills, self-determination, etc.). This will allow practitioners to understand the sample of participants in a research study and potentially determine the level of comparability to their own context.

Additionally, while it clearly had an impact on the field, the TPSID model demonstration program did not include a focus on peer-reviewed research. Funding from the U.S. Department of Education, Office of Special Education and the Institute of Education Sciences has been so instrumental in developing evidence-based practices in special education is limited to K-12 educational practices, as is the research conducted by the Office of Innovation Improvement. Therefore, the grants funded by these entities may eliminate the potential for funding research on SWID in higher education. In order for the field to progress beyond its current state, federal funding entities that support research addressing issues associated with the adult lives of individuals with ID such as the Rehabilitative Services Administration, National Institute on Disability, Independent Living, and Rehabilitation Research, and the Administration on Intellectual and Developmental Disabilities could address the issue of higher education in future research priorities and provide opportunities for research funding encouraging examination of evidence-based practice.

Consideration of the alignment of research on PSEID with the broader research on PSED must also continue. Future revisions to the PASS taxonomy (Dukes et al., 2017) could include examination of the few studies to which this taxonomy could not be applied, to consider adding or revising domain and subdomain descriptions to be inclusive of all research on PSEID. To the greatest extent possible, efforts to develop and implement research guidelines on PSE for students with disabilities should be coordinated with research specific to PSEID to prevent the latter developing as a "specialized" field and permit inclusion in all aspects of higher education, including the identification of evidence-based practice.

Finally, although the present review found TPSID programs have a strong presence in the published literature, there is a need to hear from voices other than those at TPSIDs. TPSIDs represent only a fraction of all PSE programs for SWID and operate under conditions not typical of most other programs – a greater level of funding, ability to staff programs, and, in some cases, no tuition charged to students. In programs where there is not this level of funding, or when funding goes away, there is a need to report on practices used and outcomes achieved by graduates. TPSIDs funded during 2010-2015 are in a unique position to do this and could contribute greatly to the literature by doing so.

Implications for Practice

In addition to future research, the present review has a number of implications for practitioners, bearing in mind practitioners in inclusive higher education may include higher education faculty, staff and administration as well as local educational agency (LEA) education and transition personnel and administration. One clear implication is the number of higher education options continues to grow, and the TPSID model demonstration program has created many new opportunities for SWID to access colleges and universities. Secondary and higher educators should capitalize on these new resources, visiting programs when possible and exploring the manner in which they structure services, staffing, and supports for SWID. The present review reflects a deep pool of practice from which those interested in developing further inclusive higher education practices can draw upon and build.

Second, it is incumbent upon those in higher education and in partnerships with LEAs working with SWID to ensure programs create structures to capture student outcomes. Without this information, the field, and those researching it, will continue to have difficulty assessing the long-term impact college course

access, college employment and career development, and campus membership ultimately have on students' lives. Until the issue of outcomes is part and parcel of all higher education experiences, the field will continue to grapple with questions about efficacy and cost benefit. Any program serving SWID should have a mechanism to capture and update student and family contact information and, at a minimum, gather information about employment and education engagement one year after exit.

Finally, just as researchers must continue to reach out to the higher education community to share what they are learning, practitioners must do so also. Outreach to the administrative leadership within their respective colleges or university as well as with other state and regional IHEs will build understanding and foster further development activities. Just as we should seek to avoid research on PSEID being seen as separate field of study, so too should we want to avoid PSEID to be seen as only a disability issue in colleges and universities. This can be accomplished by brokering partnerships with other higher education initiatives such as those focused on diversity and equity issues.

Conclusion

Opportunities for PSE for SWID have expanded greatly in recent years, and this growth has been reflected in the published literature. An uptick in the rate of publications was found between 2010 and 2016 and articles were located across many journals. Parallels between literature on PSE for SWID and for students with disabilities in general exist in terms of the domains studied and the methodologies used. As a field, we should be proud of what has been accomplished in a relatively short period of time. We have demonstrated students with intellectual disability are able to access postsecondary education, faculty are able to accommodate these students in their classes, and the perspectives of everyone do change when these students are included in the campus community. It is time now to devote our energies and resources to the next most important issues: determining the impact of PSE on employment and other outcomes and identifying which practices have the greatest evidence for supporting students with intellectual disability who enroll in PSE in achieving their desired goals.

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Table 1

Number of Articles by Journal

Journal	*n*	%
Journal of Postsecondary Education and Disability	11	18.3%
Journal of Policy and Practice in Intellectual Disabilities	7	11.7%
Journal of Vocational Rehabilitation	5	8.3%
Inclusion	4	6.7%
Education and Training in Autism and Developmental Disabilities	3	5.0%
Focus on Autism and Other Developmental Disabilities	2	3.3%
Career Development for Exceptional Individuals	2	3.3%
Teaching Exceptional Children	2	3.3%
Remedial and Special Education	2	3.3%
Journal of Intellectual Disabilities	2	3.3%
Intellectual and Developmental Disabilities	2	3.3%
Journal of Autism and Developmental Disorders	2	3.3%
Other[a]	16	26.7%

Note. [a] Journals in which one article was published. These were: *Northwestern Journal of International Human Rights, Research and Practice for Persons with Severe Disabilities, Rehabilitation Counseling Bulletin, The Journal of Special Education, International Journal of Whole Schooling, All Ireland Journal of Teaching and Learning in Higher Education, Psychology in the Schools, Education and Treatment of Children, Canadian Journal of Action Research, Exceptionality, Rural Special Education Quarterly, College Student Journal, The Journal of College and University Student Housing, DADD Online Journal Research to Practice, Journal of College Access,* and *Journal of Disability Policy Studies.*

Table 2

Purposes of Articles

Purpose	n
Evaluate the perspectives of stakeholders	22
Describe a particular postsecondary education program for students with intellectual disability	14
Provide guidance on how to develop or implement a program	8
Describe postsecondary education for students with intellectual disability in general or described an issue within the field	7
Describe the characteristics of programs for students with intellectual disability	6
Evaluate the impact of an intervention for students attending a program	4
Evaluate one aspect or component of a program for students with intellectual disability	3
Describe a statewide approach to creating access to postsecondary education	3
Provide outcome data on students who attended a program	2
Other	7
Total	76[a]

Note. [a] 16 studies had more than one stated purpose

Table 3

Data Collection Method and Design

Data collection method[a]	*n*	%
Survey or questionnaire	26	61.9%
Interviews	8	19.0%
Observation	6	14.3%
Record review	4	9.5%
Secondary analysis of data	4	9.5%
Student documents	4	9.5%
Focus groups	3	7.1%
Direct measurement	3	7.1%
Student narratives/images	2	4.8%
Anecdotal notes	2	4.8%
Other	2	4.8%
Design[a]	*n*	%
Description of quantitative data	28	66.7%
Qualitative	17	40.5%
Correlational	4	9.5%
Single subject	3	7.1%
Participatory action research (PAR)	2	4.8%
Case study	1	2.4%

Note. N = 42 articles involved analysis of original or secondary data.
[a]Percentages total more than 100% as some studies used more than one data collection method and/or design.

Table 4

Domain Descriptions and Subdomains

Domain	n	Domain description[a]	Subdomains	n
Student-focused support	17	Articles describe experiences and/or perceptions of students with disabilities in and after higher education.	Experiences, perceptions, knowledge, attitudes, or beliefs of students with disabilities	7
			Post-undergraduate program experiences and/or outcomes	3
			Learning/using study skills, learning strategies	2
			Requesting or using accommodations	1
			Self-determination skills	1
			Statistics on students with disabilities	1
			Career development	1
			Profiles of students	1
Program and institutional-focused support	23	Articles describe service provision by the disability services office in a higher education institution[c]. They can also relate to institutional policies and procedures pertaining to students with disabilities.	General or specific descriptions of disability programs or components	13
			Program development	4
			Experiences, perceptions, knowledge, attitudes, or beliefs of disability service providers	3
			Program evaluation	2
			Institutional policies/procedures	1
Faculty and staff-focused support	2	Articles describe knowledge, attitudes, and beliefs of faculty and non-disability services personnel to enhance access to higher education for students with disabilities. They can also relate to education or support for faculty and staff in this practice.	Faculty knowledge, attitudes and beliefs	2

<div align="right">Continued</div>

Concept and systems development	9	Articles describe development, evaluation, or validation of a variable including development/ validation of assessment instruments, evaluation metrics, theoretical models of service delivery, standards of practice, or ethics. The variable must be under proposal, in development, or being used in practice to gather empirical evidence.	Conceptual models or discussion of issues in disability services	6
			Evaluation metrics or methods	2
			Assessment instruments	1
No fit	10	Articles meet criteria for inclusion, but do not meet criteria for domains.		
Total	61[b]			

Notes. [a]Madaus et al. (2016). [b]One study met the criteria for two domains. [c]Studies involving peer mentors were coded in this category.

Building a Fluent Assistive Technology Testing Pool
to Improve Campus Digital Accessibility
(Practice Brief)

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Abstract

Usability testing that includes people who are fluent in assistive technology is an important way to ensure that digital products meet the needs of all users. In settings such as universities, with highly distributed content creator networks and vast differences in project sizes and scopes, it can be challenging for non-experts to find and use the best methods to assess accessibility. This article describes creation of a pilot pool of fluent assistive technology users from the surrounding geographic area made widely available internally to university content creators. The availability of the pool ($n = 40$) provided increased capacity to test internally developed products and vended solutions, increasing overall accessibility assessments at the university. Authors review the benefits and challenges in creating the participant pool, along with implementation details. Further discussion includes efficiencies for the university, learning by content creators, and potential directions for future research.

Keywords: web accessibility, usability testing, digital accessibility, postsecondary

Over the past two decades, digitization efforts have increased at universities and many experiences that were once analog are now online. Digital interactions are now required for everything from attending a campus sporting event and accessing course materials to using campus dining facilities and applying for financial aid. Even everyday activities like doing the laundry can require interacting with fully digitized control and payment interfaces.

With such a large number of transactions requiring digital access, it is hard to argue that the full college experience is equitable unless the entire scope of activities is available to all students. A further complexity for higher education is the sheer quantity of content creators that distribute content to wide audiences compared to traditional corporate structures. For example, it is common for each department to control its own section of the university website. In addition to the communications office, there are also department administrators, IT departments, faculty, teaching assistants, and students who are authorized to modify platforms or post content.

While it's well documented that the benefits of improving digital accessibility have an impact beyond people with disabilities, (Lazar, Goldstein, & Taylor, 2015), it is most critical for constituents where inaccessible content prevents equal participation. One perceived hurdle facing staff is the low incidence rate of some disabilities necessitating accessibility, such as blindness. But data show the rates of students with disabilities are rising on campuses (U.S. Department of Education, National Center Education Statistics, 2016), making it increasingly probable that departments or their employees serve students needing accessible digital materials, even if they do so unknowingly.

Summary of Relevant Literature

Usability is defined as a function of an interface's learnability, efficiency, memorability, satisfaction, and error handling (Nielsen, 2012). A common way to evaluate an interface's usability is to conduct usability testing using the think-aloud protocol. The think-aloud protocol "may be the single most valuable usability engineering method" (Nielsen, 1993, p. 195), allowing test moderators to quickly triangulate perception with behavior. In a think-aloud usability

test, a participant uses the interface to complete a series of tasks while narrating the actions that they are taking, providing information that is closer to behavioral data, rather than simply asking a user's opinion.

While usability testing has become a common step in the software and website development process, it often does not include users with disabilities. In recent years however, more usability professionals have advocated for including people who use assistive technology in traditional usability testing. Some experienced usability test moderators have provided practical tips on conducting such tests and conclude that they often gain new insights on usability by including individuals with disabilities in their testing (McNally, Graham, & Bellas, 2016). In addition to learning about the interface features or components that are barriers for assistive technology users, staff gain a deeper understanding of how these users navigate the digital world.

Automated testing tools are a common early step in determining if a digital product adheres to web content accessibility guideline (WCAG) criteria, but testing with real users provides benefits that go beyond WCAG conformance. For example, if a website was designed using HTML tables to create a layout, it might technically conform to WCAG standards. But it would be confusing and frustrating for a person using a screen reader, because it would read the content as if it were all within an actual table (Henry, 2010). By conducting usability tests on individuals with disabilities, test moderators gain insights related to both accessibility and usability (Henry, 2010; Utt, 2010). And by making the interface more accessible, it often becomes more usable as well.

One underlying assumption of using test participants with disabilities is that they are fluent assistive technology users because that is their primary means of engaging with electronic content. In some cases, developers become adept at using the basic functions of screen readers to quickly assess their own code with screen readers—an excellent practice, but this should not supplant the need for fluent assistive technology user testing, just as one would expect a fluent speaker to review a secondary language edition of a publication.

In order to successfully improve the case institution's broader efforts toward digital accessibility, a greater number of staff members needed to be engaged in testing and improving digital products. Given that some disabilities are low incidence, user testing was a challenge if the department did not have easy access to a staff or student with a disability. The need for lower-cost accessibility testing spanned a variety of academic offices and a variety of scenarios, including student-facing and employee-facing interfaces.

Background

In the case institution, a decentralized approach to governance and content control led to a wide variety of means by which digital content could be assessed or monitored for accessibility. While larger projects or departments may have been able to hire consultants to assist with assessment or remediation, smaller departments or application owners that wanted to make accessibility improvements did not always have sufficient resources available to outsource efforts. Some departments had asked employees with disabilities to check sites as collegial favors, and in some cases hired students with disabilities as student workers to do testing on their web properties. While those efforts had proven beneficial, not every department had personal connections with fluent assistive technology users that could assist. Relying on the time donation of faculty, staff, and students with disabilities to work on accessibility outside of their primary job duties perpetuated the time donation requests often experienced by underrepresented communities on campus (Guarino & Borden, 2017).

Depiction of the Practice

To address the need for increased accessibility testing, a cross-departmental team created a process for recruiting people who use assistive technology to serve as potential testers for university interfaces. The team included staff from the university library, academic technology, online education, and disability services offices. The team's work was initially funded by an internal staff innovation grant, but now continues via ongoing funding through department budgets.

In order to increase availability of accessibility testing by fluent assistive technology users for university staff, the team created a participant pool comprised of people with disabilities from the local community who self-identified as fluent assistive technology users. The on-call pool, comprised of people who have expressed interest and been screened, is similar to one that may exist for simple experiments in a university's psychology department. The usability testing pool is made available internally to departments that express interest in performing moderated accessibility testing on the university's digital products. It includes people who use JAWS, VoiceOver, NVDA, ZoomText, Dragon NaturallySpeaking, as well as those who use captions and transcripts regularly. Rather than capturing potentially sensitive, unnecessary medical information about a pool member's disability in the sign-up process, the form asks about which assistive technologies members use reg-

ularly. This tactic has met all product testing needs so far. Thus, the participant pool has provided staff with a systematic, sustainable way to test digital products with fluent assistive technology users, in the style similar to a usability test.

Original recruitment efforts faced some difficulties attracting enough students and employees for the pool, so recruiting efforts were shifted toward local community members which proved much more fruitful. Participants were recruited through local affinity groups for persons with disabilities and meetups and solicitations through state and local agencies serving the target populations. The team created handouts in a variety of formats including large print and braille, along with a webpage explaining the opportunity. Appendix A provides the marketing language used for advertising the opportunity.

A variety of recruitment strategies were used, including: sending messages to email lists, adding articles in email newsletters, speaking at local events, and tabling at a job fair for people with disabilities. The startup phase of the project included much higher recruitment effort, working toward a critical mass to ensure the same participants would not be used too heavily. Continuous recruitment efforts will grow the pool and maintain the size and diversity of participants in the future.

The assistive technology testing pool is now comprised of about 40 people who make use of a variety of assistive technologies. Participants are paid an hourly rate of $25 for their contributions and typically come in for three hours of testing at a time. This means a tester usually makes $75 per testing session. It was important to the team to provide monetary compensation, rather than a token thank-you gift like a gift card. The group that manages pool membership and scheduling also tracks payments. It is important to note that rate of pay, number of tests and frequency conducted, along with university policies and local tax regulations, should be considered to ensure all arrangements fall within local legal and policy guidelines.

During the first year with the participant pool a variety of usability tests were run on university systems, apps, and websites. The following types of applications were tested: online courseware, human resources software, a library video player, and the online library catalog. Table 1 shows the number of assistive technologies that were tested across the varied platforms.

Pre-Moderated Review Requirements

One important goal of the pool is to assess the experience of assistive technology users, rather than simply find basic accessibility problems with a digi-

tal product. For testing to be successful it was critical that the interfaces be tested for basic accessibility prior to engaging the usability pool. It would have been wasteful to both the participants and moderators if major product flaws--such as unlabeled buttons or images without alternative text--prevented testers from performing basic tasks. Because the pool was created as part of a university-wide internal grant program and promoted across campus, it created an opportunity to advertise other digital accessibility resources available to the university community. The team that created the pool required departments go through some other means of accessibility assessment before gaining access to the assistive technology usability pool. These pre-assessments typically involved some combination of university licensed automated accessibility tools and reviews including reading order, color contrast checking, and keyboard navigation. Additionally, as part of the onboarding process to gain access to the pool, university departments were encouraged to check the "10 Essentials" of accessibility as defined by the university-wide IT department's online accessibility website. These 10 Essentials include WCAG basics such as alternative text for images, appropriate labels for forms and buttons, and a meaningful heading structure. Ensuring these essentials were addressed amid onboarding allowed the usability tests to provide more meaningful feedback to product owners.

Testing Sessions

A short training on moderating user testing was required for moderators to ensure they were well-prepared for testing with AT users from the pool. Basic etiquette training was offered to staff, who often may not have worked with persons with disabilities before, to ensure a comfortable experience for test participants and moderators alike. The pool coordinator handled scheduling of participants and worked to find a range of technology types useful to the moderators. For example, the moderator aimed to recruit a variety of JAWS users (Windows-based screen reader), a VoiceOver user (macOS- based screen reader), a ZoomText user (Windows screen magnification software), and occasionally electronic braille display users. In addition to the usability testing consultation and "etiquette training," consultants would review testing scripts and provide examples where needed to ensure the scope and time estimates were appropriate for the testing sessions.

During a single testing session, a participant would review two different university projects in a single three-hour time period, maximizing time efficiency for the pool members and university schedul-

ing resources alike. Appendix B shows the schedule for a typical testing session. The schedule allows up to fifteen minutes for the introduction to the lab, meeting moderators, adjusting the lab equipment settings as desired, and reviewing and signing the participation authorization and confidentiality notices. Ninety minutes was allotted for the first university platform test session, followed by a 15-minute break, and then a second session of up to 90 minutes for an additional university platform.

The usability testing portions of the sessions were conducted by team members from the business unit that was responsible for the respective platform, often consisting of user experience professionals, software engineers, accessibility professionals, or web designers. Participants were encouraged to think aloud and share experiences interacting with the platforms. In some cases involving developers, testers made some quick adjustments for testing rapid prototypes. Other times, detailed notes were taken. In all cases, screencasts and audio recordings were made for internal review of the testing session. Within a few days of the test sessions, the platform teams were able to download the videos for further analysis by other stakeholders involved in the platform that was tested.

Evaluation of Observed Outcomes

After the first year of using the participant pool, the team has made some adjustments to improve the practice. One of the most time-consuming logistical challenges of the testing was that it could be difficult to meet the participant who came in for a testing session. The building where testing occurred has multiple entrances and is located within a university campus without a street-level address. The staff running tests learned to make sure that they had the participant's cell phone number and that participants had the phone number of the pool coordinator. Highly-detailed directions on where to meet were created and provided to avoid confusion.

Originally, participants had the option to either bring their own laptop to use during testing or use the lab's computers and configure the assistive technology to their preferred settings. Using personal laptops created challenges with setting up screen recording or configuring wi-fi connectivity, which was too time consuming. Thereafter, testing was conducted on lab equipment, but participants were permitted to use their personal input peripherals and allotted adequate setup time to configure the lab equipment to their preferred settings. This made the setup process much more efficient and did not impact the participant's workflow or ability to provide feedback during testing.

The team also established parameters based on what was learned during the first few months of testing. For instance, with advertisements offering "accessibility feedback," there were several requests to use the pool to help review physical facilities, however, the pool is intended specifically for digital products. Promotional materials to staff now clearly state that pool participants are available to provide feedback on digital products only.

Finally, the team promoted the service through a series of campus-wide talks, workshops, and a survey about digital accessibility across the institution. The survey invited staff members to indicate their level of interest in the pool and provide the team with estimates of demand in the coming year.

Implications and Portability

The benefits experienced so far by the case institution are promising, replicable, and offer further opportunities for researchers. First, the participant pool offered a low-cost way for distributed platform developers, interface designers, and content creator networks to conduct fluent assistive technology user testing on their digital content. The pool provided a convenient way for decentralized university units to access a proven way of enhancing accessibility. At the same time, conducting moderated testing increased staff awareness on the real impacts of their own accessibility improvements. After the grant-funded pilot concluded, the usability lab took over ongoing management of the participant pool. The lab offers the testing service to any University affiliate using a fee-for-service model. University affiliates wishing to use the pool are considered "clients" and fund the participant compensation as well as some administrative overhead fees for recruitment and test coordination.

Second, the pool offers a mutually beneficial partnership between the university and local communities of persons with disabilities. The university benefits by pooling shared needs to create reliable opportunities for user testing, whereas a single department would not have easy access to fluent AT users without time-consuming logistics and coordination. It also demonstrated a commitment to improving accessibility on campus. The benefit to community members with disabilities is two-fold: it provides them with a paid user testing opportunity at a competitive market rate, and an opportunity to build skills in identifying and articulating common accessibility barriers.

Finally, the participant pool provides ample opportunities for further research studies. The pool was originally created to solve a practical problem; however, interesting research questions abound in at

least two distinct areas.

- *Impact on university staff*: for those conducting or viewing the moderated accessibility user testing, how did the experience change their perception of digital accessibility work? If staff conduct moderated AT usability tests for one project, do they continue to incorporate accessibility work into other projects?
- *Impact on content*: what were the most frequent accessibility enhancements made after moderated usability testing? Was moderated testing more effective than the automated testing for enhancing accessibility? In a university context, what kinds of technical content was the moderated testing most successful in finding and fixing?

All these questions and similar could be appropriately structured in moderated testing pools at many universities implementing similar strategies. The resulting studies could inform practitioners to most effectively target content and usability testing to improve their overall digital accessibility efforts.

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Table 1

Products and Assistive Technologies Tested via AT Usability Pool

type	product	assistive technology tested	
		screen reader	magnification
academic applications	library catalog	X	
	library guides	X	X
	video delivery service	X	X
	library learning portal	X	X
	learning tool for online course	X	X
administrative applications	HR management system	X	X
	student information system	X	X
websites	department website	X	X

Appendix A: Recruitment Marketing Details

Accessibility Testing Participant Pool

Opportunity for proficient users of assistive technology to help test university

Digital products

Thank you for your interest in the Accessibility Testing Participant Pool! By joining the pool, you become part of a group that periodically receives invitations to test the university's digital products for accessibility. You will receive notices by email when tests are available for your participation. Tests are scheduled and participants are recruited based on the needs of projects.

Participants will be paid $25 per hour. A typical test session lasts one to three hours. Tests are conducted on campus during standard business hours between 9:00 AM and 5:00 PM.

Test session details

During tests, participants are asked to perform basic tasks using assistive technology with a digital product such as a website or mobile app. The goal of the testing is to understand how proficient users of assistive technologies navigate the university's digital products. A staff member will guide and observe the participant's activities. University computers are used for test sessions, although participants are invited to bring their own keyboard, refreshable Braille display, or other input device to use during test sessions. All participant information will be kept confidential.

Who can participate?

We are seeking proficient users of assistive technology such as screen readers (JAWS, NVDA, Voice-Over), screen magnifiers (ZoomText, Fusion), dictation/speech input (Dragon NaturallySpeaking), and other assistive technologies. You must be at least 18 years old to join the pool. We welcome students, university affiliates, and members of the community to sign up.

How to sign up

The survey will help us understand your background and the kinds of technology you use. We will periodically send announcements about testing opportunities to members of the pool. Participants who are available on the day of the test can indicate their interest by replying to the email announcement.

We usually receive many applications from qualified participants. Our staff will match the background of the interested participants with the needs of the tester. Participants who are selected will receive an email confirmation with details about the test. You may apply to participate in as many or as few test sessions as you like.

To join the testing pool, please fill out the form on our website [website linked].

Contact information

Questions? Email us at [email address]

Appendix B: Example Moderated Test Schedule
[schedule tests two products with four testers over two days]

Friday, August 4
Slot 1: 9:30-12:30
9:30-9:45   Meet participant & setup test 1
9:45-10:45   Test 1 – Online Learning Platform
10:45-11:00   Stop recording & setup test 2
11:00-12:00   Test 2- Education Tutorial
12:00-12:30   Stop recording/payment/exit

Slot 2: 1:30-4:30
1:30-1:45   Meet participant/setup
1:45-2:45   Test 1 – Online Learning Platform
2:45-3:00   Stop recording & setup test 2
3:00-4:00   Test 2 – Education Tutorial
4:00-4:30   Stop recording, payment, exit

Monday, August 7
Slot 1: 9:30-12:30
9:30-9:45   Meet participant & setup test 1
9:45-10:45   Test 1 – Online Learning Platform
10:45-11:00   Stop recording & setup test 2
11:00-12:00   Test 2- Education Tutorial
12:00-12:30   Stop recording, payment, exit

Slot 2: 1:30-4:30
1:30-1:45   Meet participant & setup
1:45-2:45   Test 1 – Online Learning Platform
2:45-3:00   Stop recording & setup test 2
3:00-4:00   Test 2 – Education Tutorial
4:00-4:30   Stop recording, payment, exit

Supporting Inclusive Teaching Through Student Observations (Practice Brief)

Stephanie W. Cawthon[1]
Savannah Davidson[1]
Sara Schley[2]

Abstract

Institutions of higher education have a primary mission of providing a quality eduation to all of its student, including students with disabilities. This practice brief describes tools used in an innovative approach to teaching observations that were designed to improve access for students with disabilities through inclusive teaching strategies, an area where faculty members typically do not have robust expertise. Pivotal to this experience was observation and feedback by student mentors using a structured classroom observation and reflection tool. These tools provided unique and important information to faculty about how to improve the inclusivity of their teaching. The tool also gave students with disabilities agency in how they contribute to the improved accessibility of teaching on their campus. At an institutional level, this kind of tool may be a catalyst for collaboration between offices of disability services and faculty development as they work together to create a more accessible campus for students with disabilities.

Keywords: access, inclusion, universal design, teaching, observation, faculty development

Quality teaching is at the heart of the mission of postsecondary education. This mission is demonstrated in two ways – first, in the evaluation of teaching when being considered for a position, retention, and merit – and second, in resources that institutions put into improving teaching quality. Many colleges and universities recognize the need for continued professional development in teaching quality as faculty advance in their careers. More specifically, faculty often lack skills on the practice of inclusive and accessible teaching strategies, particularly for diverse audiences such as students with disabilities or English Language Learners. As college enrollment for students with disabilities and those from diverse language and cultural background continues to increase, institutions must be prepared to support faculty with approaches to teaching that will reach their whole classroom. Formative feedback is an essential part of this process.

The purpose of this practice brief is to describe the assessment tools and evaluation frameworks used in a collaborative project focused on improving the accessibility of postsecondary teaching through a professional learning community (Marchetti et al., in press). The brief opens with an overview of key ideas

behind inclusive teaching practices and measurement as part of that process. Next, the goals of this project are discussed in terms of the context that it provides to offer feedback to faculty about the implementation of identified inclusive strategies. Finally, the brief focuses on how a classroom observation tool and faculty learning community process developed a space for implementation of accessible teaching practices. Implications and areas for future work are offered.

Summary of Relevant Literature

Inclusive Teaching Practices

Universal Design for Learning (UDL) is a common framework for thinking about accessible and inclusive teaching strategies (Burgstahler & Cory, 2008). The UDL approach encourages faculty to be mindful, positive, and creative about classroom practices. When used effectively, UDL principles help meet the needs of the community of learners while focusing on access for individual learners (Rodeslier & McGuire, 2015; Rose, Harbour, Johnson, Daley, & Abaranell, 2006). Far from a prescriptive exercise or set of strategies, UDL was developed to be flexible in

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order to allow instructors to think intentionally about how these approaches meet the specific needs of their classroom content and format (Pittman & Heiselt, 2014). Fully inclusive environments (including classrooms) are at the heart of the Americans with Disabilities Act and in the mission of many postsecondary institutions to serve and support diversity in their campus population. Yet faculty need support in developing inclusive teaching practices (Moore, 2013; Smith & Tyler, 2011).

Measuring Teaching Quality

Measuring the quality of teaching is a challenging task and the reliability and validity of common teaching evaluations enjoy intense debate (Marsh, 1984). Assessment of postsecondary faculty tends to be equated with either (a) student reviews of teaching obtained at the end of the term; or (b) observations that are a part of a larger, more comprehensive review of a faculty members' contribution to teaching and learning. One of the less frequently discussed elements regarding faculty feedback is the relationship between the faculty member and the student (Lopez-Pastor & Sicilia-Camacho, 2015). While in some cases classes consist of large lecture halls (or online platforms) full of hundreds of students, in other contexts faculty and students know each other, and even have more than one course or other academically related interactions within a student's program of study. While degree of interaction is a desired component of learning experiences (Nwankwo, 2015), this closer proximity sets up a lack of anonymity that has implications regarding the reliability of the responses. There is a concern that providing negative feedback might have consequences for the student both within and across course experiences. This is particularly challenging when thinking about formative assessments conducted when the immediate learning experience is still underway.

Depiction of the Problem

Gathering reliable and valid student feedback on teacher use of inclusive teaching strategies is an obvious need, but a challenging process. There is rarely attention to issues of diversity, access, and inclusion in most summative teaching observation forms that are used at the end of the semester to rate teacher quality and course satisfaction. Furthermore, there are few faculty development models that include ways for students to provide structured and formative feedback to faculty about the accessibility of their teaching. Students with disabilities have an important view point to contribute in feedback about teaching accessibility. As key holders of knowledge about the

characteristics of students with disabilities on campus, Disability Service and Resource Offices have the potential to provide institution-wide advisement, consultation, and training in order to facilitate equal access. Including a student feedback and observations component would just be an addition to the model, but could be an invaluable tool when discussing accessibility because one size does not fit all. This practice brief describes the classroom observation tools and feedback methods that were a critical component of a professional development model that included students with disabilities.

Participant Demographics and Institutional Partners and Resources

This project context was an initiative to support faculty at a STEM-focused university in implementing accessible teaching strategies, with a specific emphasis on strategies that are successful in classrooms with hearing and deaf or hard-of-hearing students. This project was conducted in partnership with a large public university that focused specifically on the assessment tools and design. The overall project goals were to (a) improve resources available for faculty teaching students in mainstream settings, (b) create training environments where faculty are encouraged to experiment with and innovate new resources and strategies for accessible and inclusive pedagogy, and (c) to sustain and expand these practices via multifaceted dissemination efforts (Names removed for review, 2018). The overall project examines the role of student observations of faculty teaching, specifically focusing on accessibility in classrooms with diverse students. The observation tool and process that is the focus of this practice brief was implemented as part of the ongoing feedback loop between students and faculty as part of the professional development project.

Participants in this project include project facilitators, faculty, and undergraduate student mentors. The four facilitators of the professional learning communities have extensive experience on the research and practice of accessibility for deaf and hard-of-hearing students and are faculty in a range of departments across the campus. The lead measurement design faculty worked with the project directors and met periodically with the student observers as part of their training on the feedback measures and discussion of reesults. A range of six to eight faculty have participated each semester across three semesters of the project thus far. Each faculty member applied to be part of the project and receive support from their departments to participate in the professional learn-

ing communities. The undergraduate cadre of four-six deaf undergraduate students served as student mentors for the six to eight faculty. All were deaf or hard-of-hearing and used a range of communication modalities. Faculty and students were paired based on schedule availability; some students were paired with more than one faculty member to ensure coverage across the project. Undergraduates were paid for their work and represented a range of majors across the campus.

Description of Practice

Faculty Learning Community

The model chosen focuses on pedagogical conceptual change, going beyond the "what" of teaching, and instead encouraging faculty to focus on the "why" behind the practice of inclusive teaching (Keiny, 1994). The overall context of this project was the work of a Faculty Learning Community (FLC), which consisted of faculty members who agreed to spend a semester participating in a group to learn new practices, skills, and technology applications (Nugent et al., 2008; Richlin, 2004). These groups provided faculty with a safe and supportive space to reflect on the practice of teaching, and to explore challenges and strategies within a group of peers. This collaborative environment included several tools that were designed to: (a) capture the use of the access strategies, and (b) give feedback as to the overall accessibility of teaching. UDL principles served as a "hook" into designing strategies to be more accessible and inclusive. Faculty were not required to revamp their courses to follow UDL principles from start to finish. Instead, UDL was framework to identify current challenges in a faculty member's classroom, and to develop, implement and evaluate a strategy solution in the classroom.

The Observation Tool and Process

Observation tool. The main assessment strategy used to facilitate interaction between the participating faculty and the student participants was the classroom observation tool (see Appendix). The class observation tool served as a template for students to take observational notes about access and inclusion factors in the classroom. They were asked to note physical features of the class session (lighting, seating layout, etc.), faculty pedagogical strategies (pacing, use of visuals, course activities), interaction in the classroom (between students, and between the students and the faculty member), and perceptions on what went well in the session and what could have been done to increase access and inclusion with the stu-

dents. Students were also given a set of instructions about how to observe the class sessions and make observation notes. In addition, they participated in a training session as well as ongoing discussions about conducting class observations and giving feedback to faculty. The observation tool was revised twice, once after the pilot and once when online teaching components arose as a key area for further observation. These revisions were made based on feedback from the student mentors. Student observers thus had time to grow into this role as not only observers, but analysts of the tools they were using.

Faculty-student mentor pairs. Student mentors were paired with each faculty participant. Starting in week three (out of 14) of the semester, they observed the faculty's class sessions on at least a weekly basis. During the first week of observations, they observed all class sessions during that week to lay a foundation for understanding course content, the instructor's teaching style, and student interaction. For subsequent weeks, they observed a single class session and took notes using the observation tool. In addition to standard questions, faculty identified specific areas for feedback from the student mentors. After each week of observations, student observers met with the faculty member to discuss what they observed and to talk about access and inclusion challenges. They used the observation form as a starting point for the discussion and followed a structured protocol that allowed for both connection to the training as well as specific examples that arose in the class session.

Evaluation and Observed Outcomes

The use of an observation tool within professional development is perhaps not unique in and of itself, but the connection between the content (inclusive teaching), the participants (student observers and faculty), and the method (the observation tool) dovetailed to support a dynamic and in-depth shift in how the participants engaged in pedagogical change. The implications of this project thus lies in the intersection of these three components. The remainder of this brief discusses how the observations and the tool, specifically, led to an increased rigor and quality of the professional development experience.

The observation tool was structured to provide student observers and faculty with an inquiry-based approach to implementation of inclusive teaching strategies. The observation tool was developed around the same questions about pedagogy that shaped the professional development training. Students were empowered to think critically not only about the classroom activities, but also the function of the observation tool

itself. Revisions to the tool were made because students wanted to expand the applicability of the tool to both face-to-face and online learning platforms. This tool was adaptable across learning settings.

The observation and complementary dialog helped facilitate a new kind of relationship between students and faculty. The change in power differential allowed the student perspective to gain traction with the faculty cadre. Through the use of this particular assessment tool, inquiry, shared goal setting, and collaboration was encouraged; this innovative process likely benefited both faculty and students. The use of a concrete observation tool provided a method for naming the goals and providing a safe space for shared discussion about the process. This teaching observation tool was co-constructed by faculty and student observers in that faculty chose the specific items related to inclusive teaching that they wanted to have included in the observation. This processing of the experience immediately after the class with the notes from the observation available allowed faculty to work within the context of that particular day.

Implications and Portability

The feedback tools from this project have some significant implications for faculty feedback and development of inclusive teaching practices at post-secondary institutions. The purpose of this observation was less to evaluate impact on student learning outcomes and more to engage in deeper dialog about enhancing the inclusivity of teaching strategies. The tools and protocol from this project would be beneficial for campusus providing feedback to faculty across a range of topics within accessibility. Even in an abridged version, disability services offices could collaborate with faculty development centers to craft a sequence of opportunities that include training in a specific content area such as facilitating quality class discussions with students with diverse communication modalities. A cadre of students trained in the same area could serve as resources for faculty members and get a valuable student perspective. This model could thus inform training not only for the faculty, but also for students who wish to pursue teaching careers or related educational fields.

Creating a faculty learning community in tandem with student observers is not a simple task. There were many logistics challenges that came with the complexity of the content, the inquiry, and the relationships involved. Scheduling alone was often difficult and sometimes slowed the momentum of the observation process. Faculty members were also on different timelines as to when they began to implement the accessibility strategy that they drew from the training. There were often several weeks between the start of the semester and when students had the opportunity to obseve those practices in the classroom, possibily reducing the impact that student feedback would have on that practice in the remainder of that semester. This project is also resource intensive; many campuses may need to identify strategies to reduce time and labor costs, use online platforms, and create cohorts of trained students so that the model is sustainable over a longer period of time.

Research on this feedback model could expand the evidence base for this student observation practice to support inclusive teaching practices in a number of ways. The first is to obtain the perspectives of the students who are enrolled in the class; the only perspectives collected are from student mentors who are trained specifically in the accessibility content area that forms the foundation of the project. There are also possible extensions of the data collection period from these student mentors by expanding this model so that it takes place over the course of a year, and not only within a single semester. A number of the areas that students provided feedback with include integrating technology, working with physical space, etc. – elements of teaching that may require coordination with institutional resources. It may be that three months is not enough time to capture the benefits of the formative feedback from student mentors to faculty, particularly when part of this time is the initial training period.

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Appendix
Classroom Observations Form

Your Name: _____ Date_____ Starting Time: _____ Ending Time: _____

Faculty Name: _____ Course Name: _____

Number of Students in Class Today (estimate): Total: _____ Deaf/Hard-of-Hearing: _____

What did you like about the class/online component? What did faculty do well?
(Please be specific with examples)

What did you think could help make the class/online component more accessible for students (deaf or hearing)? (Please be specific with examples)

FACE-TO-FACE: Did you notice any of the following as supporting access?

1. Lighting choices (e.g., Bright? Glare? Shadows?)
2. Pacing (e.g. Fast? Too slow? Just right?)
3. Use of Visuals (e.g. Smartboard, PowerPoint/slides, propos, video, role play, etc.)
4. Positive feedback
5. Classroom atmosphere (e.g., light, tense, free flowing, friendly)
6. What else?

ONLINE: Did you notice any of the following as supporting access?
1. Visually vs. auditorily based media (podcasts, movies, text slides, media embedded)?
2. Are there captions on video? Or transcript?
3. Lighting and Pacing of Faculty Created Media (same as above)
4. Use of Visuals (slides, graphics, etc.)
5. Opportunities to Engage (discussion posts, video chats, goReact? Voicethread? Google docs? etc.)
6. Interaction between faculty and students?
7. Positive feedback from faculty?
8. Interaction between students?

Access Strategy Use (once faculty is using it in class), What is the strategy?

1. Did the faculty member use their face-to-face ATK strategy well?

1	2	3	4	5
Not at all		Somewhat		Extensively

Explain what you saw and why you gave it the rating you gave.

2. Did the faculty member use their online ATK strategy well?

1	2	3	4	5
Not at all		Somewhat		Extensively

Explain what you saw and why you gave it the rating you gave.

What's Happening?

Activity or Focus	Online or face-to-face component?	Observed? Yes or No	Notes: Description or example of how it was used or where it was missing
Teachers			
Used different kinds of activities in class.			
Presented ideas in more than one way.			
Provided students with more than one way to participate			
Encouraged students to participate in class and respond to faculty/other students.			
Encouraged students to collaborate in group activities			
FACULTY SELECTED ATK STRATEGY			
FACULTY SELECTED ATK STRATEGY			

Activity or Focus	Online or face-to-face component?	Observed? If yes, please circle deaf, hearing, or both	Notes: Description or Example
Students			
Responding when the faculty member asks a question.		Deaf	
		Hearing	
Participating in group activities with other deaf students.		Deaf	
		Hearing	
Participating in group activities with other hearing students.		Deaf	
		Hearing	
Using their phones or computers for activities not related to class.		Deaf	
		Hearing	
Sleeping or similar disengaged behavior (in class only).		Deaf	
		Hearing	
Asking a question without prompting (e.g., from faculty).		Deaf	
		Hearing	
Other:		Deaf	
		Hearing	

Reach Everyone, Teach Everyone: Universal Design for Learning in Higher Education (Book Review)

Thomas J. Tobin and Kristen T. Behling, Morgantown, WV: West Virginia University Press, 2018. 325 pages, $25 (Amazon)

Reviewed by Amy Lomellini[1]

"I don't have time to do all that work if it benefits just a few students with disabilities" (p. 4). This misconception about Universal Design for Learning (UDL) is a common challenge that accessibility professionals and course designers face when attempting to solicit faculty and administrator buy-in for UDL initiatives. *In Reach Everyone, Teach Everyone: Universal Design for Learning in Higher Education,* Tobin and Behling argued that to increase UDL adoption on higher education campuses, UDL needs to be distanced from the negative association with accommodations and reframed through a mobile learning lens. Tobin and Behling provided compelling and, at times, idealistic new strategies and practical approaches to engage faculty and administrators in the UDL conversation.

On the very first page, Tobin and Behling essentially told the reader to forget what they think they know about accessibility. Comparing UDL to the 1979 Florida Orange Growers Association's slogan that orange juice "isn't just for breakfast anymore," Tobin and Behling reasoned that UDL "isn't just for people with disabilities anymore" (p. 14). Instead, Tobin and Behling reasoned that moving away from UDL as a disability services term and towards a mobile learning lens will broaden and reframe UDL into a positive approach associated with modern learners. Tobin and Behling argued that the mobile learner approach will appeal to campus leaders seeking strategies to increase student persistence, retention, and satisfaction while reducing the need for individual accommodations. However, the authors only slightly acknowledged that key players sometimes do not see the benefit of designing for mobile learners because of the pervasive notion that students should learn the way faculty were taught years ago (i.e., face-to-face lectures). Designing for online learning, which is significantly older than mobile learning, is still facing constant acceptance and perceived quality challenges in higher education. If faculty and administrators do not buy into the idea of designing for mobile learners, one of the authors' key premises in the book could potentially unravel.

As with any course design strategy, UDL is often seen as resource intensive work that can paralyze faculty and administrators who do not know where to start. To address this barrier, Tobin and Behling suggested involving a diverse UDL team of people from across the campus. While this idea may spread out the work, inter-departmental coordination is always challenging. In their suggestions to reframe UDL, Tobin and Behling outlined UDL strategies that are potentially achievable in 20 minutes, 20 days, and 20 months by emphasizing the plus-one approach of making small, incremental changes to make UDL changes more manageable. While not an entirely new approach, the level of detail and guides provided assist the reader in breaking down the seemingly overwhelming task of starting UDL conversations and effecting change.

Intended for all audiences, *Reach Everyone, Teach Everyone: Universal Design for Learning in Higher Education* reads as a practical guide to starting conversations and implementing UDL principles not only in courses but at the program, systems, and institutional levels as well. It is unlikely that many administrators working in the registrar's office, information technology, and other support areas are familiar with UDL, making even the foundational information meaningful to various audiences. Tobin and Behling began each chapter with a narrative to highlight success stories and tales of woe surrounding UDL at colleges and universities across the United States. The stories illustrate common struggles and triumphs one can expect when trying to obtain campus-wide buy-in for UDL. The research-backed action steps guide readers through the practical integration of UDL on their campus. Each chapter ended with a "thought exercise," that if completed along the way, could culminate into a detailed and actionable UDL implementation plan.

Tobin and Behling illustrated UDL principles in action even through their writing. Modeling the UDL strategy of providing choice and multiple pathways through content, the authors included a visual infographic-style map outlining the contents and a text-based "suggested first-read chart" highlighting essential chapters for faculty members, student ser-

vices staff, faculty services staff, and campus leaders (p. 15). This approach can serve to focus interested parties on only the chapters that are directly related to their priorities. For example, Tobin and Behling chose not to include the legal chapter for faculty in their suggested first-read chart. The recent increase in accessibility-related lawsuits are often used as talking points for the necessity of training and changes in higher education. Excluding faculty from the intended primary audience of the legal information aligns with the chapter's theme of why you should not start with a compliance, legality, and fear mindset when initiating UDL conversations on your campus. The negativity and fear of a disability lawsuit is not an effective change-making strategy or conversation starter.

With a nod to *Star Trek: The Next Generation's* Captain Jean-Luc command, "Engage!" the authors hoped to inspire readers to engage in a UDL conversation to shift the mindset of campus leaders towards a more inclusive campus-wide approach. This pop culture reference exemplifies the easy reading and wide appeal of this book as a whole. The shift away from a focus on students with disabilities to a mobile learning approach is a different take on a traditional framework. As a person well-versed in UDL topics, I found the new take refreshing. While more research needs to be done, the shift of UDL to a mobile learning lens and perhaps more importantly, the appeal to student persistence, retention, and satisfaction could better catch the attention of campus leaders, faculty, staff, and students. The narrative approach in *Reach Everyone, Teach Everyone: Universal Design for Learning in Higher Education* serves as an anecdotal look into what other institutions are doing in the field. This book is well-suited for almost anyone in higher education looking for a new approach to UDL. For those less familiar with UDL, the initial chapters lay the groundwork and the easy reading style makes the content accessible. For more experienced readers, the twist on the traditional approach to UDL and the practical guides set forth will provide a new structured approach to continue championing UDL on their campus.

About the Author

Amy Lomellini is an instructional designer in the Office of Blended/Online Learning and Student Success at Molloy College in New York. She has used her personal and professional experiences to be a driving force for physical and digital accessibility initiatives in higher education, vocational services, and within professional organizations.

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JPED Author Guidelines

Manuscripts must be submitted electronically as attachments via email to jped@ahead.org.

Content

Manuscripts should demonstrate scholarly excellence in at least one of the following categories:

- Research: Reports original quantitative, qualitative, or mixed-method research.
- Integration: Integrates research of others in a meaningful way; compares or contrasts theories; critiques results; and/or provides context for future exploration.
- Innovation: Proposes innovation of theory, approach, or process of service delivery based on reviews of the literature and research.
- Policy Analysis: Provides analysis, critique and implications of public policy, statutes, regulation, and litigation.

Format

All manuscripts must be prepared according to APA format as described in the current edition of *The Publication Manual, American Psychological Association.* For responses to frequently asked questions about APA style, consult the APA web site at http://apastyle.org/faqs.html

- All components of the manuscript (i.e., cover page, abstract, body, and appendices) should be submitted as ONE complete Word document (.doc or.docx).
- Provide a separate cover letter asking that the manuscript be reviewed for publication consideration and stating that it has not been published or is being reviewed for publication elsewhere.
- Manuscripts should be double-spaced and range in length between 25 and 35 pages including all figures, tables, and references. Exceptions may be made depending upon topic and content but, generally, a manuscript's total length should not exceed 35 pages.
- Write sentences using active voice.
- Authors should use terminology that emphasizes the individual first and the disability second (see pages 71 - 76 of APA Manual). Authors should also avoid the use of sexist language and the generic masculine pronoun.
- Manuscripts should have a title page that provides the names and affiliations of all authors

and the address of the principal author. Please include this in the ONE Word document (manuscript) that is submitted.

- Include an abstract that does not exceed 250 words. Abstracts must be double-spaced and located on page 2 (following the title page). Include three to five keywords below the abstract.
- Tables and figures must conform to APA standards and must be in black and white only. All tables and figures should be vertical and fit on the page; no landscape format. If Tables and/or Figures are submitted in image format (JPEG, PDF, etc.), an editable format must also be submitted along with a text description of the information depicted in the Table/Figure. This will be provided as alt format in the electronic version of JPED, making Tables/Figures accessible for screen readers.

How to Submit Manuscripts

All manuscripts (research and practice briefs) must be submitted to JPED at this email address: jped@ahead.org and must include the following:

- Subject Line: JPED Manuscript Submission.
- Body of Email: Include a statement that you are submitting a manuscript for consideration for the JPED. Include the title of the manuscript and your full contact information. Please indicate whether you are submitting a research manuscript, practice brief or book review.
- Attach to the email:
  - Your complete manuscript, prepared as directed above.
  - Cover letter as outlined above.

You will receive an email reply from Richard Allegra (Managing Editor of JPED) to confirm receipt of your submission within 5-7 business days.

Upon Acceptance for Publication

For manuscripts that are accepted for publication, Valerie Spears (JPED Editorial Assistant) will contact the lead author to request:

- A 40-50 word bibliographic description for each author, and a signed copyright transfer form (Valerie will send templates for both).
- Manuscript submissions by AHEAD members are especially welcome. The JPED re-

serves the right to edit all material for space and style. Authors will be notified of changes.

Practice Brief Manuscripts

JPED invites practitioners and/or researchers to submit Practice Briefs that can inform readers of innovative practices that could, in time, become the basis of an empirical study. Practice Briefs will describe new or expanded programs, services, or practices that support postsecondary students with disabilities. Practice Briefs are not research articles. Manuscripts that involve data analysis beyond the reporting of basic demographic data or evaluative feedback should be submitted as research articles. The overall length of a Practice Brief will be limited to 12 double-spaced pages, which includes separate title page, abstract, and references pages. Tables and/or figures may be submitted, too, above and beyond the 12 page limit.

Please submit all components of a Practice Brief (i.e., cover page, abstract, body, appendices) as a single Word document. These manuscripts should use the following headers/sections:

- **Title Page:** Title not to exceed 12 words. Identify each author and his/her campus or agency affiliation. State in your email cover note that the work has not been published elsewhere and that it is not currently under review by another publication.
- **Abstract:** The abstract needs to answer this question: "What is this paper about and why is it important?" The abstract should not exceed 150 words.
- **Summary of Relevant Literature:** Provide a succinct summary of the most relevant literature that provides a clear context for what is already known about your practice/program. If possible, describe similar practices on other campuses. Priority should be given to current literature published within the past 10 years unless an older, seminal source is still the best treatment of a particular topic/finding.
- **Depiction of the Problem:** In addition to a clear statement of the problem being addressed, consider the following questions when stating the purpose of the article: What outcome, trend, or problem might improve if your practice/program works? What gaps or problems or issues might persist or arise if this practice/program did not exist?

- **Participant Demographics and Institutional Partners/Resources:** Maintain the anonymity of the students, colleagues, and campus(es) discussed in the article but provide a clear demographic description of participants (e.g., number of students, disability type, gender, race and/or ethnicity whenever possible, age range if relevant) and the types of offices or agencies that were collaborative partners (if relevant).
- **Description of Practice:** Briefly and clearly describe your innovative practice/program and how it has been implemented to date. Tables and figures are encouraged to provide specific details you are comfortable sharing. They condense information and enhance replication of your practice/program on other campuses.
- **Evaluation of observed outcomes:** Whenever possible, summarize formative or summative data you have collected to evaluate the efficacy of your practice/program. This can be anecdotal, qualitative, and/or quantitative data. Support any claims or conclusions you state (e.g., "Our program greatly enhanced students' ability to self-advocate during their transition to college") with objective facts and/or behavioral observations to support these claims.
- **Implications and Portability:** Discuss what you have learned thus far and how you could further develop this practice/program in the future. Be honest about any challenges you may have encountered. This transparency enhances the rigor of your reporting. What would you do differently next time to achieve stronger outcomes? Provide a clear description of how and why disability service providers on other campuses should consider adapting your practice/program. Finally, how could your practice be studied by researchers? Identify possible research questions, hypotheses, or potential outcomes that could be studied if you and/or colleagues could expand the practice/program into a research investigation.
- **References:** Use the current APA guidelines to format and proofread your paper prior to submitting it. This includes the proper use of spelling, punctuation and grammar, appropriate use of headers, correct formatting in listing references, and formatting any tables or figures appropriately.

Upon Acceptance for Publication

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- Manuscript submissions by AHEAD members are especially welcome. The JPED reserves the right to edit all material for space and style. Authors will be notified of changes.

Guidelines for Special Issues

JPED publishes one special issue per year (normally Issue 3, published in the fall). Special issues feature a series of articles on a particular topic. JPED welcomes ideas for special topical issues related to the field of postsecondary education and disability. The issue can be formatted as a collection of articles related to a particular topic or as a central position paper followed by a series of commentaries (a modified point/counter point). Authors who wish to prepare a special issue should first contact the JPED Executive Editor at jped@ahead.org.

The authors should describe the topic and proposed authors. If the series appears to be valuable to the readership of the JPED, the Executive Editor will share an Agreement Form to be completed and returned by the Guest Editor. The Executive Editor may provide suggestions for modification to content or format. The Guest Editor will inform authors of due dates and coordinate all communications with the contributing authors. Each special edition manuscript will be reviewed by members of the JPED editorial board members. The Guest Editor and the Executive Editor will be responsible for final editing decisions about accepted manuscripts.

Book Review Column Guidelines & Procedures

Please contact the JPED Executive Editor at jped@ahead.org to suggest books to be reviewed or to discuss completing a book review. Contact and discussion should be done before the book review is completed in order to expedite the procedures in the most efficient and fairest way possible.

Content and Format

In general, the book review should present:

- An overview of the book, providing the book's stated purpose, the author's viewpoint, and a general summary of the content.
- An evaluation of the book, elaborating on the author's objectives and how well those objectives were achieved, the strengths and weaknesses of the book along with the criteria you used for making that assessment, and the organization and presentation of the book. Recommendations should specify to whom you would recommend the book, why, and how you would suggest the book be used, and address its potential contribution to our field.
- Citations within the book review should follow the current edition of the American Psychological Association (APA) style manual.

At the end of the review, please list your name and institutional affiliation.

Submission

The length of a book review can range from 800-1200 words. Please send in an email attachment in MS Word, double-spaced to jped@ahead.org per instructions above in "How to Submit Manuscripts." After the review is submitted, the Executive Editor or designee will edit the manuscript and follow up with you about the publication process.

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